

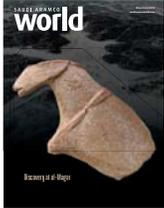
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world

May/June 2012
saudiaramcoworld.com



Discovery at al-Magar



A raised vertical band and a subtle incision over the muzzle are what make experts wonder if this sculpture might be one of the earliest known depictions of a domesticated horse. Photos courtesy of SCTA.

Publisher

Aramco Services Company
9009 West Loop South
Houston, Texas 77096, USA

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ISSN

1530-5821

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Circulation

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Design and Production

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Printed in the USA

RR Donnelley/Wetmore

Address editorial correspondence to:

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Saudi Aramco World
Post Office Box 2106
Houston, Texas
77252-2106 USA

Back Cover



Through calm and storm, the *Jewel of Muscat* and her crew from nine nations demonstrated the resilience and ingenuity of the sewn-plank ships that once dominated Indian Ocean trade. Photo by Robert Jackson.

Saudi Aramco, the oil company born as an international enterprise more than seventy-five years ago, distributes *Saudi Aramco World* to increase cross-cultural understanding. The magazine's goal is to broaden knowledge of the cultures, history and geography of the Arab and Muslim worlds and their connections with the West. *Saudi Aramco World* is distributed without charge, upon request, to a limited number of interested readers.



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Written by Peter Harrigan

Photographs courtesy of the Saudi Commission for Tourism and Antiquities

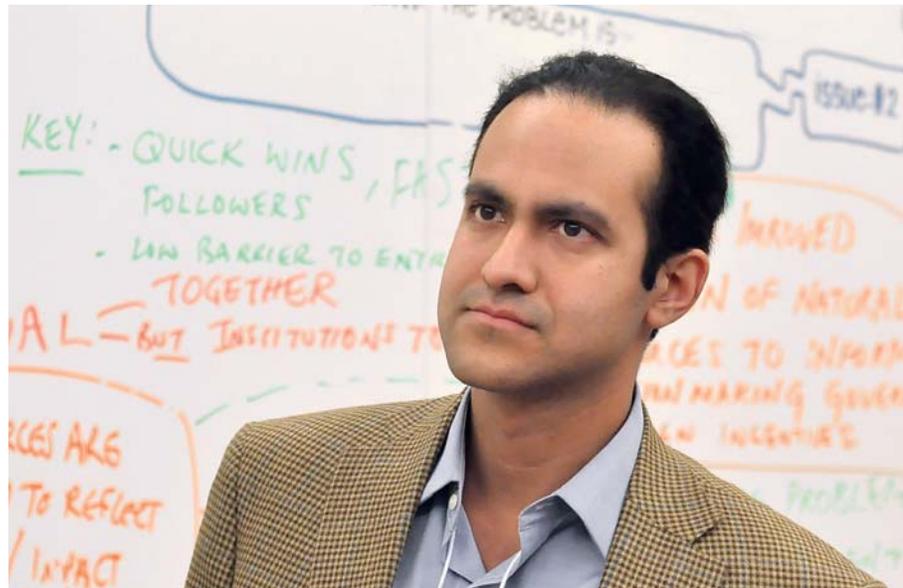
After a Saudi camel rancher found a mysteriously horse-like sculpture that is likely some 9000 years old, it and some 300 other sculptures and artifacts are raising new questions about where, when and how humans domesticated horses. This spring, the artifacts traveled for display at the British Museum.



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Written by Naazish YarKhan

Manufacturing and ecology; consumption and sustainability; environmental cooperation and political tension: All can be thought of as complementary, says Saleem H. Ali, whose "brave thinking" is bringing him international acclaim, recently from the World Economic Forum, which named him among 2011's "young global leaders."

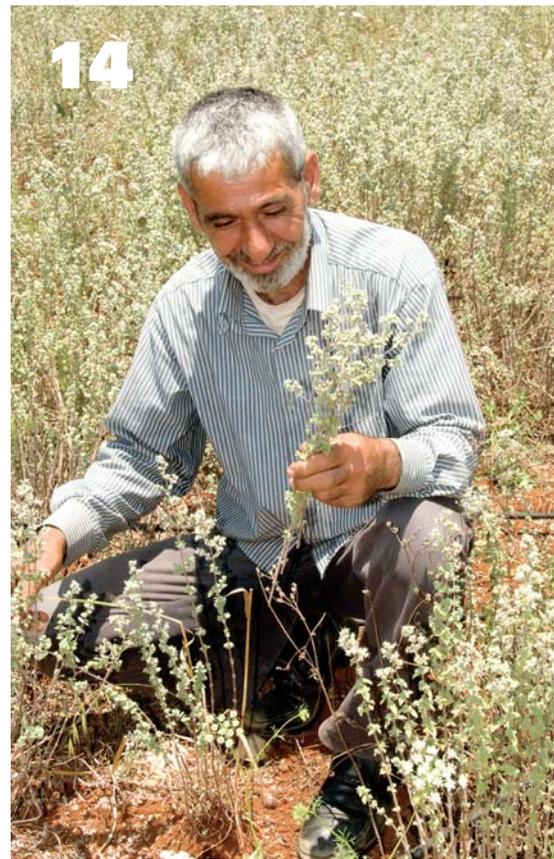


Thyme Travels

Written by Alia Yunis
Photographed by Tor Eigeland

Mix wild thyme, sumac, sesame and other spices with necessity, nostalgia and cultural identity and you get *za'tar*, the ubiquitous Levantine Arab spice mix for dipping, baking and making friends.

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Sailing Through Time: *Jewel of Muscat*

Written and photographed by Robert Jackson

Hand-built to replicate a ninth-century merchant vessel that plied the “Maritime Silk Road” between Oman and Southeast Asia, the *Jewel of Muscat* sailed for five months along the greatest sea-trade route of its era to a permanent berth in a Singapore museum.

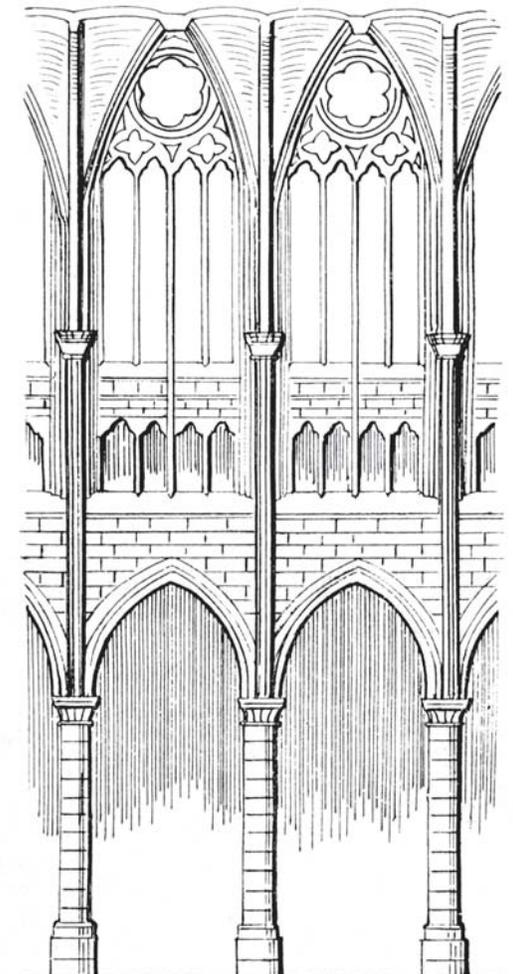
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The Point of the Arch 34

Written and photographed by Tom Verde

Historians have long acknowledged the Arab roots of the pointed arch that Europeans associate with the High Middle Ages. While the arch's historic journey ended in Paris—where it became known as “Gothic”—it can be traced back, step by step, south and east to its early uses in waterworks and mosques in North Africa and the Levant.



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Discovery at al-Magar

Written by Peter Harrigan

Photographs courtesy of the Saudi Commission for Tourism and Antiquities

When Mutlaq ibn Gublan decided to dig a *birka* (pond) to keep his camels watered, he arranged for a backhoe and drums of diesel fuel to be driven from the road to the site on his ancestral grazing lands in southwest Saudi Arabia. The spot he had chosen, amid finger-like valleys that cut through low sandstone hills, was near traces of an ancient waterfall, which hinted that, in millennia past, nature itself supplied more than a mere birka.

His pond was never completed. As he supervised the excavation, he says, “I spotted a smooth, shaped stone sticking out of the ground. I recognized it was an old and important object.” He could tell at once it was a statue of an animal. It was buried upright, head toward the surface, he says. “I paid off the operator and told him to follow his tracks back to the road.”

Over the next few years, Ibn Gublan unearthed some 300 objects there. Though none was as large as the first, his finds included a small stone menagerie: ostrich, sheep and goats; what may be fish and birds; a cow-like bovid (*Bovidae*); and an elegant canine profile that resembles one of the oldest known domesticated breeds, the desert saluki. In addition, he found mortars and pestles, grain grinders, a soapstone pot ornamented with looping and hatched geometric motifs, weights likely used in weaving and stone tools that may have been used in leather processing, as well as scrapers, arrowheads and blades—including an exquisitely decorated stone knife in the unmistakable curved design of the traditional Arabian dagger.

Two years ago, he loaded it all up in his Jeep, drove it to Riyadh and donated it to the Saudi Commission for Tourism and Antiquities (SCTA).

“When I first saw the pieces, I just could not believe it. It was, how can I say, *incroyable*,” recalls Ali al-Ghabban, head of antiquities at the SCTA, his French-accented English giving away his years at the University of Provence. “This is Neolithic material,” he states, from “a sophisticated society possessing a high level of art and craftsmanship that we have not previously seen.” Al-Ghabban had a laboratory run a radiocarbon analysis on trace organic remains found later alongside some of the objects.

Above and right: **The largest, and to date the most significant, of more than 300 artifacts found so far at al-Magar is a sculpture fragment whose head, muzzle, nostrils, arched neck, shoulder, withers and overall proportions resemble those of a horse, though it may represent an ass, an onager or a hybrid. Eighty-six centimeters (34") long, 18 centimeters (7") thick and weighing more than 135 kilograms (300 lbs), it is provisionally dated to about 7000 BCE.**





"I recognized it was an old and important object," says Mutlaq ibn Gublan, who canceled excavation of his camel-watering pond when the excavator's backhoe struck the Neolithic sculpture. "I am happy that in the footsteps of my grandfather and his long line of ancestors I have found something from the heart of Arabia that goes deep into our history and helps connect us with the past."

If the vertical band and the incision arcing over its muzzle are halter, lead or bridle markings, then people at al-Magar may have been domesticating horses up to 2000 years before anyone else in the world—but such speculation remains to be proven.





Diameter: 8 cm (3 1/8")



Diameter: 10-12 cm (4-4 3/4")

Length: 76 cm (30")



Two other curious finds at al-Magar include the devices above left and center, which both may be tools used in the crafting of fiber or leather cords or thongs. Right: A large stone used for the grinding of grain. Lower: This stone dagger is curved and decorated in the manner of traditional Arabian daggers.

That dated the material to between 6590 and 7250 BCE, he says.

The discovery has been named “the al-Magar civilization” after its location, a name that means “gathering place” or “headquarters” in a tribal context. It is the carvings of animals—far more numerous, and some larger, than anything previously found in the western Arabian Peninsula—that are the most intriguing. Among them, the largest, the one that prompted Ibn Gublan to stop the backhoe, has sparked the most curiosity of all.

Eighty-six centimeters (34") long, 18 centimeters (7") thick and weighing more than 135 kilograms (300 lbs), the carving has a rounded head, arched neck, muzzle, nostrils, shoulder, withers and overall proportions that clearly resemble an equid—a horse, an ass, an onager or some hybrid. But what makes it so very curious are its two distinctive tooled markings—one in relief from the shoulder down toward the forefoot, and the other carefully, even delicately, incised around the muzzle. The question fairly leaps out: Were the people who inhabited al-Magar putting early forms of bridles on such animals? If so, they were doing it millennia before experts believe it was done elsewhere.

The discovery at al-Magar and the electrifying question it raises come as Saudi Arabia experiences a resurgent pride not only in its archeological heritage but also, particularly, in the legacy and culture of the desert-bred Arabian horse. The discovery also coincides with recent advances in analytical technologies that can



Length: 15 cm (6")

help address important questions: When and where did humans begin to move from hunting wild horses (*Equus ferus*) for food, bone, hide and hair toward the capture, taming and exploitation of horses for meat, milk and transport—a process that gave rise to the subspecies (*Equus ferus caballus*) that is today’s domesticated horse? This pivotal historic development revolutionized transport and trade, allowed people to connect over much larger distances, speeded migrations and changed conquest and warfare. Yet despite more than a century of archeology and the latest in genetic technology, it remains an open question exactly when, where and how domestication occurred. The discovery at al-Magar shows again just how very open a question it is.

When Ibn Gublan removes from a document case a sheaf of neatly clipped and plastic-protected press clippings, in both Arabic and English, and fans them out in the tented *majlis* (salon) of his brother’s home, it is the picture of the banded and incised equid-like statue that takes pride of place. In a scholarly manner, he adjusts his thick-rimmed glasses and peers at a photograph of Saudi King Abdullah bin ‘Abd al-‘Aziz examining the objects last year, when the discovery was announced and the finds were first displayed to dignitaries and high government officials.

With mint tea brewing on the hearth and Arab coffee deftly served by his young nephew Saud, attention turns to this prize statue. It is the centerpiece of a new archeological discussion, and its initial interpretation is as challenging and contentious as it is intriguing.

A wet epoch in Arabia, starting after the last Ice Age, about



Height: 30 cm (12")



Height: 20.5 cm (8")



Height: 60 cm (24")

Left to right: Among the animal sculptures found at al-Magar are a sheep or ram's head, the head and neck of an ostrich, and this elegant head and neck of what may be a hunting dog.

10,000 years ago, and enduring for about 5000 years, allowed widely varied flora and fauna to flourish. Evidence of this is abundant in rock art throughout the western Arabian Peninsula, where depictions of various equids appear along with other species, such as cheetah, hippo, hyena and giraffe, which disappeared as the climate dried to desert. How and when the horse appeared is a matter of both emerging science and Saudi cultural pride—this latter evidenced not only by today's pride in Arabian horses, but also by the rich legacy of poetry and legend, going back deep into pre-Islamic times, that surround and celebrate the desert-bred Arabian horse.

The sculptures from al-Magar "might be" equids, says David Anthony, author of *The Horse, The Wheel, and Language* and a leading authority on the domestication of the horse. "The local equid in southern Mesopotamia was the onager, and another was

the ass, introduced probably from Egypt. No *Equus caballus* specimens have been found, to my knowledge, anywhere near Saudi Arabia before 1800 BCE." For anything conclusive, he continues, "there need to be finds of definite *Equus ferus caballus* bones in a good stratified context dated by radiocarbon."

In March 2010, the SCTA flew Saudi and international archeologists and pre-historians to al-Magar for a brief daytime survey. The team fanned out and, in a few hours, collected more stone objects, including tools and another horse-like statue. They also sifted out four samples of burned bone, which were later used for radiocarbon dating of the site. The date, about 9000 years before the present, coincides with the period when the inhabitants of the first known settlements in Arabia and the Levant, already starting



Al-Magar lies amid the low hills and sandy valleys of southwestern Saudi Arabia, which until 4000 or 5000 years ago was as verdant as African savannah today.

to cultivate crops, were also beginning to domesticate animals.

With the area now monitored to prevent illicit digging, the SCTA is preparing for detailed surveys and excavations expected to take years. “This impressive discovery reflects the importance of the site as a cultural center and could possibly be the birthplace of an advanced prehistoric civilization that witnessed domestication of animals for the first time during the Neolithic period,” says al-Ghabban. “We now need to know more.”



Equid species known to Neolithic humans in Africa and Asia included the African wild ass, *Equus africanus somalicus*, above; the onager, *Equus hemionus onager*, right; and the early wild horse, *Equus ferus*, opposite, from which today's domestic horse species are descended.



All current evidence points to the Eurasian steppe, and probably not much earlier than around 4000 BCE,” as the place and time the horse was first domesticated, says zooarcheologist Sandra Olsen, head of anthropology and director of the Center for World Cultures at the Carnegie Museum of Natural History. Olsen has studied the roles of horses in human cultures since 1975 and pioneered research on horse domestication. She and her colleagues have documented the oldest evidence for domestic horses known to date: It comes from about 3500 BCE, in northern Kazakhstan.

In 2010 and 2011, Olsen joined Majid Khan, a specialist on Arabian rock art, in Saudi Arabia for a kingdom-wide survey of known rock art that shows equids—and a quest for new finds. Khan has spent the last three decades investigating Saudi petroglyphs, and he estimates there are more than 1000 that portray equids as hunted, ridden or draft animals. He believes the earliest among them date back into the Neolithic era—though assigning accurate dates is notoriously challenging.

Given the limitations of the archeological record, how can archeologists make progress in identifying where and when the long process of domestication actually began? Olsen describes her team's approach as “holistic,” or simply, “piecing together as much evidence as possible, whether direct or more circumstantial.” In the steppes of Asia, she adds, “we also take an

‘upside-down’ approach: If the prehistoric horse bones are difficult to decipher, then why not look at the settlement and at traces of the human lifestyle for evidence that they were affected by horse domestication?”

According to al-Ghabban, it is just such a multidisciplinary approach that will be applied at al-Magar, where specialists will include zooarcheologists, geoarcheologists, archeobotanists, paleoclimatologists, petrologists, paleontologists, authorities on the domestication of flora and fauna, and archeogeneticists, who will likely be enlisted to use relatively new mitochondrial DNA (mtDNA) analysis. What makes mtDNA analysis particularly useful is that—unlike nuclear DNA—mtDNA resides outside a cell's nucleus, which means it is inherited exclusively through the maternal line, unshuffled from generation to generation. MtDNA

studies comparing a range of domestic horse breeds reveal high diversity among maternal lines, or matriline. This diversity, Olsen says, supports the theory that horse domestication took place in a number of different places at different times. “There was no one ancestral mare that was the ‘Eve’ of all domestic horses,” she says.

Supporting this view is a study published in January in the journal of the US National Academy of Sciences that examines the rate of mutation of equine mtDNA. It not only concludes that communities in both Asia and Europe domesticated horses independently, but also suggests how far back in time domestication events may have taken place. Alessandro Achilli, assistant professor of genetics in the Department of Cellular and Environmental Biology at the University of Perugia in Italy, collected maternally inherited mitochondrial genomes from living horses in Asia, Europe, the Middle East and the Americas. Because mtDNA mutation occurs at a known rate, these samples allowed him to trace maternal ancestry using a kind of “molecular clock.”

His team identified maternal lines descending unambiguously from different female ancestors. “This means that multiple female horse lines were domesticated throughout the Neolithic period—during the last 10,000 years—in multiple locations of Eurasia, possibly including western Europe,” says Achilli. “The very fact that many wild mares were independently domesticated

in different places testifies to how significant horses have been to humankind. Taming these animals could generate the food surplus necessary to support the growth of human populations and the human capability to expand and adapt to new environments, or could facilitate transportation.” Achilli adds that “unfortunately, we have no idea about the exact location of the domestication events,” a question that only archeological DNA sampling can answer.

Olsen, though inclined to agree, cautions against accepting this as any kind of last word. She argues that humans and wild animals, as well as horses, all have different maternal lines. “I think



that these multiple matrilineages are the result of ancient horse herders occasionally catching and adding wild mares to their breeding populations,” she says. And, she adds, in the other direction, “domesticated mares can be ‘stolen’ by wild stallions and incorporated into their harems.”

However it took place, the generally accepted scenario of multiple, separate domestication events does open the tantalizing possibility that the Arabian Peninsula had its own horse-domestication event, and the Peninsula’s last wet climatic period would seem like an ideal epoch for that to have occurred, if indeed it did. While Arabian domestication implies that there would have been wild horses roaming a then-verdant, savannah-like landscape, Olsen believes that picture is not supported by the petroglyphs she has seen in the country, nor by any skeletal remains, which have yet to be found. Although she accepts that wild asses or onagers are shown being hunted in Neolithic Saudi petroglyphs, she contends that the earliest horses she has seen on the Peninsula are those depicted with chariots, and those, she says, are “no older than at the most 2000 BCE.” That

shows “why I believe it is imperative to distinguish between wild asses and *hemionos* [onagers] versus horses.”

As in all detective work, one of the great dangers is flawed evidence. Nearly half a century ago in the Ukraine, a Soviet archeologist uncovered the skull and lower leg bones of a young stallion at Dereivka, near the banks of the Dnieper River. Radiocarbon analysis dated the find at 4200 to 3700 BCE, and the stallion’s premolars showed signs of wear by a bit. Soviet archeologists confidently pronounced that the site was evidence of horse domestication. But the find’s importance collapsed when more detailed radiocarbon dating showed that the remains were what archeologists call “an intrusive deposit” placed there by Iron Age Scythians in the first millennium BCE.

Subsequently, studies have looked not only for evidence of horses being ridden but also for evidence of their being herded. Attention shifted east, over the Ural Mountains, to the northern marches of Kazakhstan, where in the 1980’s, near a small village called Botai, Viktor Zaibert of Kokshetau University unearthed horse bones—300,000 of them.

Zaibert, collaborating with American and British archeologists, found traces of bit wear on lower-jaw teeth, revealing that

around 3500 BCE some Botai horses were indeed probably harnessed, either for draft purposes or for riding, or both.

Olsen was among Zaibert’s collaborators, and she identified in Botai traces of corrals and of roofing material that contained horse manure, as well as signs of ceremonial sacrifices. She also found tools used to make leather straps that may have served as

bridles or hobbles. This is parallel to some of the stone tools found at al-Magar, which also point to the likelihood of leather or fiber processing, which could be associated with items of horse tack. But however significant indirect evidence may be, one of the lessons from Botai is that if al-Magar is to inform us, then it is not only reliable taxonomy of the statuary, or interpretation of artifacts, that is required, but also organic remains.

It was Alan Outram, a professor of archeological science at Exeter University, who found fat residues absorbed in Botai pottery that were later determined to be from milk rather than meat. The overwhelming proliferation of horse bones on the site logically suggested mare’s milk, which to this day remains a popular traditional drink throughout Central Asia. The

The generally accepted scenario of multiple horse-domestication events cracks open a tantalizing window of possibility for the Arabian Peninsula to have had its own.

thousands of horse bones, found in 150 house pits, show these horses were slender, like later Bronze Age domestic horses, distinct from the more robust wild horses that once roamed the Eurasian lands from the steppe to Iberia. Nevertheless, “in our science it is very difficult to determine whether the horse was domesticated or not. The answer to this question is based on a complex study of all contexts of the material culture,” says Zaibert.

Olsen homes in on the bones: “Hunters abandon heavy bones of low utility at faraway kill sites, whereas herders slaughter

of the people who lived here, domestication, trade and migration, and perhaps any early ritualistic importance,” he says, adding that “a pause is needed before we can make judgments.”

Also present on the SCTA’s initial survey team was Michael Petraglia, a specialist in Paleolithic archeology and stone-tool technologies of the Arabian Peninsula. He quickly found at al-Magar a far older historical horizon. Adjacent to the Neolithic finds, he found flaked stone tools, such as scrapers, that he estimates exceed 50,000 years in age. Al-Magar “was an attractive environment for human activity over multiple periods,” he says. “This is very important not only for the more recent site, but also



Unambiguously domesticated horses appear in petroglyphs dating back to the second or late third millennium BCE. The mounted hunter, above, and the two-horse chariot, right, are both from northwestern Saudi Arabia. The chariot of similar appearance, opposite, was drawn in southern Libya. Lower: This simple, even crude, petroglyph near al-Magar may show a mounted rider.



domestic animals in or near their village. In the latter case, all of the bones of the skeleton are found at the home site, and that is exactly what appears at the Botai sites.” Soil analysis in enclosures at one Botai site identified high levels of phosphate and sodium, indicating that manure and urine were present inside what were likely corrals, and Olsen has found signs of postholes around some, reinforcing the idea that at Botai, people corralled some of their horses. These enclosures, as well as houses set in circles and rows, all point toward a kind of social organization that could lend itself to horse domestication.

Just as Botai included developed settlements, the discovery at al-Magar includes traces of stone structures. Abdullah al-Sharekh, an archeologist at King Sa’ud University, was among the first experts on the site. He was impressed with the large number of scattered stone structural remains connected with settlement and with signs of agricultural activity that he saw around the site, as well as along the tops of surrounding hills, including walls erected along the slopes. The buried statues were all found within the remains of a building. “Nothing this size has been found in Arabia before, and the stratigraphic evidence will make this perhaps the most significant site in Saudi Arabia,” says al-Sharekh. “In a regional context, a find of such variety must have significance. It can tell us about social aspects and the culture

for what it can tell us about past climatic fluctuations between dry and humid periods.”

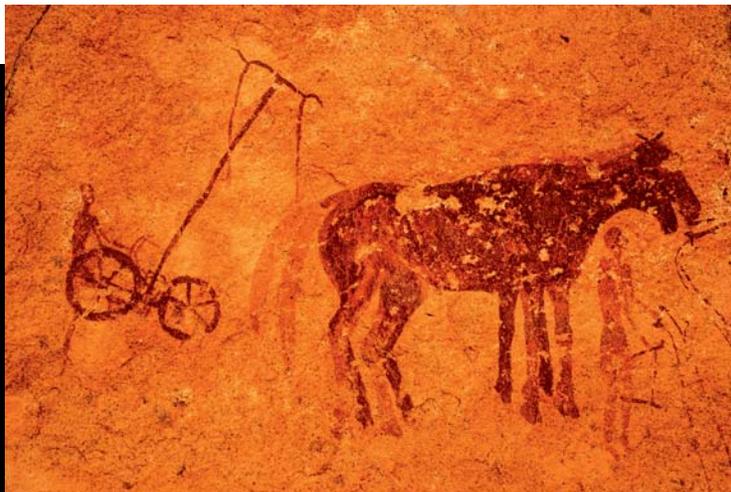
It also makes al-Magar all the more intriguing as a possible site of early horse domestication. The equid-like sculpture’s



prominent bas-relief band, which could represent a halter, is not unique: Other, smaller, equid-like statues from the site also have bands across the shoulder. There is also on this largest piece the incision around the muzzle to the middle of the upper jaw, which resembles a noseband. Do these features portray tack, or do they represent natural aspects of the animal itself, such as musculature or coat markings? (The question has been posed before: In the 1980's, analysts of Paleolithic paintings in French caves advanced claims that certain markings on horses indicated halters and consequently suggested that domestication

in Europe dated back as far as 25,000 years. World authorities, including Olsen, debunked this by showing that the markings portrayed body features and hair patterns, not halters.)

Before the use of metals, halters, reins and other tack were made entirely from natural materials, and among the al-Magar finds are stone implements that may have been used to produce



Above: Paleolithic cave painters at Lascaux, France and elsewhere depicted horses with great skill, but with no visual evidence of domestication.

Wild, Tame or Domesticated?

Of the planet's roughly 5500 mammal species, only one, *Homo sapiens*, over the last 15,000 years or so has selected and controlled the breeding of other species for food, transport, worship, companionship and other purposes. Exactly how many species have been so controlled depends on the definition of "domestication," a word derived from the Latin *domus*, meaning home.

"What domestication is *not*," says Alan Outram, "is taming wild animals." For example, he says, although reindeer are hunted and herded for meat and are used to pull sleds, attempts to manage their breeding for specific desirable traits has so far been unsuccessful. That makes them "tame" rather than "domesticated," he maintains.

Dogs, our first successful domestication, are a dramatically different story. Current theory places the process in Russia, possibly as far back as the Upper Paleolithic. The hypothesis is that some feeble gray wolf pups, runts ejected from the pack, gravitated toward humans for survival. As subordinate creatures that could help a hunter retrieve wounded prey, they earned their adoption, and *Canis lupus familiaris* evolved.

At the other end of the time line is the horse, which is our penultimate major domestication. (Bactrian and dromedary camels followed around 3000 BCE.)

Only 14 species account for more than 90 percent of the world's domesticated livestock. By controlled breeding, humans have developed some 4000 varieties from only nine of those species: In order of their domestication, they are sheep, goat, pig, cattle, chicken, ass, horse, buffalo and duck. Horses account for some 300 of those breeds.

And what is the most common of all the domestic animals? The answer is the chicken—population 19 billion—followed by cattle at 1.4 billion and dogs at 500 million. Horses? There are about 65 million in the world today.



Alan Outram hopes for the chance to examine horse teeth that may be found at al-Magar to see if they would show characteristic effects of wear caused by leather bits.



long strips of leather from the hides of sheep, goats or equids. Al-Ghabban is particularly intrigued by a semi-spherical black stone with a deeply cut, rounded cleft worn smooth. Curious lines are scored on either side of the gap. “We have not seen anything like this before, and we need to carefully study this piece and what it tells us about processing leather and making rope and cord,” he says.

Outram explains its potential significance. “As a culture develops away from hunting and gathering and toward such activities as horse herding, the tool kit people use changes. We find more scrapers than pointed projectiles, as well as entirely new processing tools,” he says, pointing to such similar tools at Botai sites as leather thong smoothers carved from horse jawbones. Outram has conducted laboratory simulations using tools recreated from horse mandibles, processing thongs that could have been used as tack or tethers.

Tack made from organic materials rarely survives in the archaeological record, and thus stone tools, petroglyphs and equine dental wear must provide the evidence of pre-metal-age bits on equids. To establish whether soft bits leave dental wear patterns, and what those might look like, David Anthony pioneered experiments with bits made from leather, hemp and horsehair rope, which he kept in place with cheek pieces made with flint tools. Comparing before-and-after equine dental mouldings, he found that the organic bits created beveled wear that indeed differs from the abrasion patterns known from metal bits.

“The date when *Equus caballus* was introduced into northern and eastern Arabia has been debated since the 19th century,”

The earliest suggested *Equus asinus* domestication in the Levant was probably about 3500 BCE. If so, al-Magar may represent the dawn of a much longer-than-expected domestication process.

says Michael Macdonald, a research associate at the Faculty of Oriental Studies, University of Oxford. Writing 15 years ago on the horse in pre-Islamic Arabia, he explains that controversy is to be expected until considerably more research is carried out. “It will be many years before a coherent picture emerges,” he says.

But there is no controversy that al-Magar constitutes a significant discovery. To Khan, it represents the earliest known Neolithic settlement in the Arabian Peninsula and provides “solid and undeniable evidence of the presence and domestication of horses in Arabia.” He backs up his claim not only with the statuary but also with the discovery, within a few minutes’ walk of the site, of petroglyphs showing ostriches, dogs and ibex. One image, deeply pecked into the rock and with a heavy patina of oxides built up over millennia, hints at a figure mounted on an animal. Khan is convinced it portrays a rider and a horse, and he considers it Neolithic, contemporary with the oldest rock art he has studied so thoroughly at Jubbah, near Hail in northern Saudi Arabia.

Others remain cautious. Juris Zarins, chief archeologist of the expedition that in 1992 discovered the “lost” city of ‘Ubar, and who worked in the early days of archeology in Saudi Arabia in the 1970’s, says that he is “not surprised” at the finds because al-Magar belongs to a region that is “an archeological hotbed,” and that it is “not out of the realm of possibility” that the markings could be the first hints of domestication. “There has not been enough exploration carried out in Arabia,” he says, “and new discoveries like this could change things.” Whatever the species the sculptures represent, he agrees the nose marking in particular could be significant. “In Arabia in the Neolithic period, we

The Synthesist

Written by Naazish YarKhan



“Greed is not bad,” says Saleem H. Ali.

If this sounds odd coming from a professor of environmental studies who is also the director of the Institute for Environmental Diplomacy and Security at the University of Vermont (UVM), Ali will explain that greed is not simple avarice. It’s part of our “treasure impulse,” which powers not only our desire to collect and consume but also our quest to innovate and discover “new ways to harness materials and energy to better the human condition.” Today’s challenge, he says, is to focus this impulse on planet-wide challenges.

“Pollution is one problem, but so is people dying of hunger and poverty,” he says. “If you really value human existence and quality of life, the quest for innovation should always be there.”

In his 2010 book *Treasures of the Earth: Need, Greed, and a Sustainable Future*, he explored these and other ideas drawn widely from geology, economics, ecology and psychology. Among them are concepts like “sustainable consumption,” “livelihood chains” and “elemental accounting.” This last concept has been pioneered in the mining industry through such initiatives as the 2003 Kimberly Process that tracks diamonds in order to prevent the industry from

“Brave thinking” and playing devil’s advocate help communities understand multiple points of view.

inadvertently financing armed conflicts. It turns governments and companies into partners in resource tracking, it can improve buyer awareness, and it helps keep “blood diamonds” out of international markets.

Born in New Bedford, Massachusetts, Ali spent part of his childhood in Pakistan, his parents’ homeland, and he credits the experience with his love of bringing together diverse ideas to produce something new. For example, he says, he learned to see Pakistan’s repair and service industries in the light of sustainability: These countless small and often informal businesses not only fix what might otherwise be discarded into land-

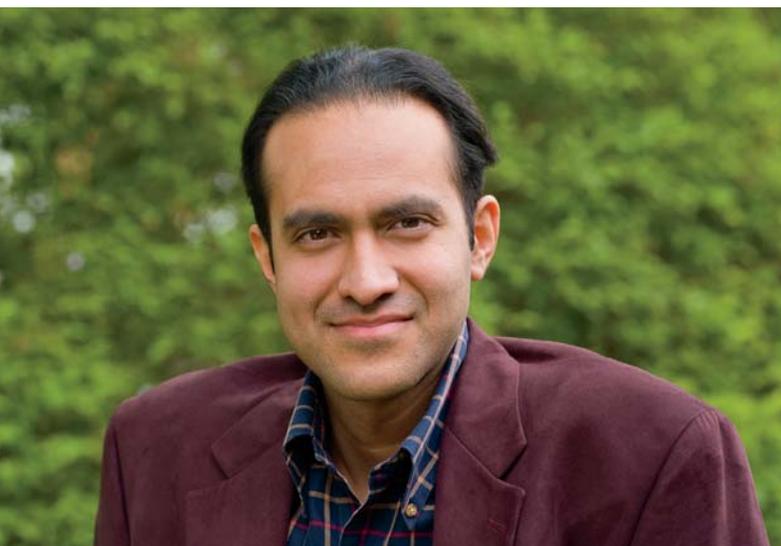
fills, but also provide jobs.

This leads to broader notions such as “industrial ecology,” where the goal is “to make waste obsolete, whether it’s material or energy. It’s based on the premise that industry is a permanent part of the planet, so it should be thought of as part of the natural system,” says Ali.

Such positions often put him at odds with what he calls “the anti-technology narrative” among environmentalists. “Technology can be misused,” he says, “but we must constantly seek new ways to better the human condition.” He cites the Kalundborg Symbiosis in Denmark, where diverse industries “became mutually beneficial by using the by-products and energy discarded by one as raw material for another.” Kalundborg, however, didn’t develop by industrial partnerships alone: Government provided catalysts in the form of high fees for landfills, water and energy, and it’s these kinds of partnerships Ali often advocates, the better to stimulate innovation.

His “brave thinking,” as his UVM colleague Thomas Hudspeth calls it, is bringing Ali global recognition. Last year, the World Economic Forum named him a “young global leader”—he is not yet 40—and Britain’s *The Observer Magazine* included him among 20 “green giants” who will be “setting the global environmental agenda in the coming year.” *Seed* magazine in 2007 listed him among eight “revolutionary minds in the world.”

Ali’s multidisciplinary approach is essential, says Hudspeth.





Saleem H. Ali attended this year's World Economic Forum in Davos, Switzerland as one of the WEF's 190 Young Global Leaders. "Finding ways by which the environment can help to develop our economies while also mitigating conflict remains a personal and professional commitment for me," he says.

Prior to his professorship, he adds, Ali "worked for Fortune-500 companies, so he has an insider's perspective on both business and the environment." Hudspeth, like Ali, finds that their field, environmental studies, increasingly demands that its students become knowledgeable in sciences and engineering in order to understand environmental complexities.

Peace Parks is the title of a book Ali edited in 2007 that offered analysis of some of the world's 188 parks that straddle international boundaries, and proposed a step-by-step guide to creating and strengthening them. Peace parks, Ali says, reduce political conflict through environmental and resource cooperation.

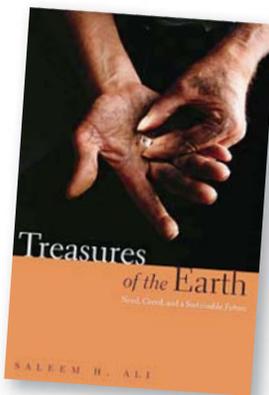
"If you focus on the environment as a quantity rather than quality, you'll fight over it. To ensure its quality, you'll cooperate over it," he says. This work contributed to his selection as an "emerging explorer" in 2010 by the National Geographic Society.

When the UN-mandated University of Peace, founded in Costa Rica in 1980, wanted to develop a curriculum called *Peace Education: Islamic Perspectives*, Amr Abdalla, professor and vice rector, came to Ali. "A wide population of Muslims relies to a

great extent on their understanding of their religion to guide all aspects of their lives. We see no contradiction between Islam and disciplines such as peace, conflict and environment," says Abdalla.

"A high standard for environmental responsibility," he adds, helps people "move away from an attitude focused on their own specific self-interest to an enlightened understanding of their self-interest within a wider sense of responsibility to the environment, based on their religious teachings." In Pakistan, the curriculum will be taught as an experiential program, bringing children from government, private and religious schools to study together; in the US, California-based Zaytuna Academy will bring the program to Muslim schools.

To Samir Doshi, a former student of Ali's and now a postdoctoral fellow at Queen's University in Canada, Ali is an iconoclast. "Saleem always questions convention. I have seen [him] play devil's advocate with the effect that a community or stakeholder arrives at a better understanding of those who disagree with them. This is one aspect that makes him so effective at conflict resolution and negotiations. It is also a much needed quality in environmental planning and sustainable development." 🌐



Naazish YarKhan is a content strategist, writer and editor with a master's in communications. She has written extensively for media including National Public Radio, *The Huffington Post*, *Chicago Tribune* and Common Ground News Service.

 **Treasures of the Earth: Need, Greed, and a Sustainable Future.** Saleem H. Ali. 2010, Yale UP, 978-0-300-14161-0, \$30 hb, \$20 pb.

Peace Parks: Conservation and Conflict Resolution. Saleem H. Ali, ed. 2007, MIT Press, 978-0-26251198-8, \$31 pb.



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environmental protection: M/J 99, N/D 97



www.uvm.edu/~shali/
www.upeace.org

Written by Alia Yunis / Photographed by Tor Eigeland

“My suitcase isn’t overweight!” explained the Jordanian woman in front of me to the check-in agent at the airport in Amman. To make her point, she pulled from it a large plastic bag of dried, crushed leaves. “This is not ‘extra weight’! It’s *za’tar* I’m taking back for my relatives.”

Though the clerk still charged her for excess baggage, he expressed his sympathy, understanding—like so many Arabs—that *za’tar* is not an extra but an essential. Even so, the

Thyme Travels



woman was far calmer than the Australian–Lebanese man who made the local news when Brisbane customs officials confiscated his mother-in-law’s za‘tar baggies. He called it a “tragedy” and a “disaster,” and demanded to speak to a member of parliament. Indeed, it is neither hummus nor falafel that Arabs pack away in their suitcases to bring along the flavor of home: It is za‘tar. And they do so with passion.

The Arabic word *za‘tar* (*zaah-tar*) means two things: It is the name of a herb that grows primarily in the hills of the eastern Mediterranean and, more importantly, it is the name of a mixture of that herb blended with sesame seeds and other spices—a blend made by mixing nostalgia with necessity. Eaten as a dip with olive oil, za‘tar is a ubiquitous staple on breakfast tables in Lebanon, Jordan, Syria and Palestine. “We had nothing to eat but za‘tar and olive oil” is an expression meaning, “We had only our staples.” Today, za‘tar is also loaded with symbolism and

identity, appearing in art and music, such as poet Mahmoud Darwish and composer Marcel Khalife’s collaboration “Ahmed Al Arabi,” in which za‘tar stands for inner strength and home. The mixture is also finding its way into hip restaurants that draw people with the comfort implied by the word, such as the *Za‘tar wa Zeit* chain, which began in Lebanon and has expanded to several other Arab countries.

There is unfortunately no direct translation for *za‘tar* in English, although it is often called wild thyme. “It is a taste more than a species,” explains Jihad Noun, an expert on medicinal and aromatic Lebanese plant species. He becomes animated when the subject turns to za‘tar.

“There are 22 herb species referred to as za‘tar in the region. It is the essential oils they have in common. They all come from the same *Lamiaceae*, or mint, family, which includes savory, oregano and thyme. Personally, I can eat za‘tar anytime. Za‘tar is what opens our palates.”

Za‘tar mixtures vary by region and even from shop to shop and home to home. Nearly everyone has an opinion about where to find the best mix—and it usually happens to be in his or her own hometown.

The biggest national producer and exporter of za‘tar is Jordan. In Suweifeh, a lively middle-class shopping district of Amman, Izhiman and Kabatilo are two shops that anchor a street notorious for its traffic jams. While Izhiman started out in Jerusalem in 1893 specializing in coffee and Kabatilo

“One kilo of seeds produces 5.5 million plants,” explains Abu Kassem, opposite, as he gathers samples of the herb za‘tar, or wild thyme, from one of his southern Lebanon fields, which he harvests by hand with a scythe. Below: Stripping za‘tar off the sprigs. Right, lower: Crushed and sifted, za‘tar leaves, far right, are ready to be mixed with sesame seeds (left) and uncrushed sumac berries (top).



specialized in spices, they are both equally renowned today for their za‘tars. Kabatilo offers 12 different kinds, with the four premier mixes taking the prime spot near the cash register. Such premium za‘tar comes to Jordan from the hillsides of the West Bank, where growers from around the villages of Jenin, Qaliqiya and Tulkarem collect wild za‘tar in the late spring. The other za‘tars in Jordan come from cultivated fields.

“Wild mountain za‘tar is very spicy, usually too strong on its own, but cultivated za‘tar in Jordan is grown on



With multiple varieties of wild thyme and an infinite number of combinations of za'tar's ingredients available, Abu Kassem prepares his own favorite mix above, while leading spice shops such as Amman's Izhiman, right, can offer a dozen or more varieties. "We sell five tons of za'tar a month," says executive manager Naser Matouq.



flat land, and is cheaper and less tasty,” explains Naser Matouq, executive manager and the fourth generation of his family to work at Izhiman.

That shop offers seven za‘tar mixes, all made from Palestinian or Jordanian za‘tar and all lined up in open wooden bins where the “za‘tar manager” helps

Workers hand-sift the za‘tar three or four times in small quantities to remove stems or debris; they then put the herb through a special machine to crush it. Za‘tar is almost always mixed with sumac, a berry grown in the region, which undergoes a similar process, turning a vibrant maroon as its shell and seed are separated. The

worth it. Cheap za‘tar is mixed with citric acid instead, but that is not acceptable to me, taste-wise or visually.

“Sesame seeds were once not part of the mix, but it is now rare to leave them out,” he adds. “We use local sesame seeds for all the za‘tar mixes except those intended for *mana’esh*. For our *mana’esh* mix, we use Ethiopian or Sudanese seeds, which are smaller but less likely to burn.”

Mana’esh is the ultimate za‘tar comfort food: a circular flatbread spread with a paste of za‘tar and olive oil, best served piping hot from a wood-burning oven. There may be no greater *mana’esh* experience than stopping in the little mountain villages that dot the spine of Lebanon, where you will come across family bakeries that make your *mana’esh* on the spot, using either their own za‘tar mix or, if you prefer, the one you’ve remembered to bring from home. Some like the dough crispy and paper thin; others prefer it thick and soft.

“We make ours thick so that it holds more of the mixture,” says baker Nabil Kamal Eldin in the town of Batloun. His daughter Sara rolls out the dough and tops it with oil and za‘tar, while he mans the wood-burning oven. The za‘tar turns brownish-black as it bakes, and the cooking turns the flavor mellow, salty, lemony, piquant.

“The *man’oushé* is an icon to the Lebanese, a way of life,” says Barbara Abdeni Massaad, using the Lebanese singular of *mana’esh*. “When someone comes back to Lebanon, they want to eat a *man’oushé*.” In 2005 Massaad published *Man’oushé: Inside the Street Corner Lebanese Bakery*, containing some 70 recipes and photographs. Born in Lebanon, she spent several



Above: Flatbreads with a paste of za‘tar and oil become *mana’esh*, “the ultimate za‘tar comfort food,” prepared above at Izhiman, where the baker’s output immediately finds eager consumers, below.

customers sample and choose. He will, upon request, add sumac, sesame seeds or salt to fine-tune one of the mixtures to a discerning customer’s preferences before sealing up the plastic bags. The original mix is called Za‘tar Royal: za‘tar, sumac and sesame seeds, all in measured proportions. A less expensive option adds smoked wheat to make the za‘tar last longer. But the greatest demand is for Za‘tar Special, which includes za‘tar, sumac, sesame, roasted wheat, coriander, caraway, fennel seeds, dill and salt.

“In Jordan alone, we sell five tons of za‘tar a month,” says Matouq. “It’s so much a part of who we are. All our mothers used to make us eat za‘tar sandwiches before exams because everyone believes za‘tar makes you smarter.”

Just outside Amman, Izhiman’s production facility dedicates two entire floors to za‘tar production. White cloth sacks of dried West Bank za‘tar leaves fill up a room of shelves—away from sunlight, which can degrade the za‘tar’s natural oils.

spice—not the same as North America’s poison sumac—adds a tart, lemony flavor to the mix. “Forty-seven percent of the sumac berry is lost, as we only use the outside, not the seed,” says Matouq. “But it’s



years in Florida as a teenager, working at her father's Middle Eastern restaurant. After returning to Lebanon, where she married and had three kids, she decided to combine her passions for food and photography to produce a book. "My favorite food was pizza," she recalls, "so I thought I would do research on pizza. Then I woke one night and thought of the 'Lebanese pizza,' the man'oushé. Why am I thinking about Italy, when right here we have the man'oushé? I began visiting as many of Lebanon's bakeries as I could—and that's around 250 bakeries."

Along the way, she discovered some unique mana'esh, including ones that include Aleppo pepper paste or ground walnuts in the spice mixture. But Massaad also believes in the experience of making mana'esh at home with her kids. She's learned a few tips for home baking from the professional bakers. "The key to a good man'oushé is having the right za'tar mix and baking at a high temperature. You don't want the best za'tar for man'oushé. The highest grade of za'tar can become quite bitter when cooked. Bakers also save money by mixing the spices with vegetable oil, rather than just olive oil. There is actually a lightness that comes with that, even though olive oil is still precious."

With the help of longtime experts such as Abu Kassem, below, Barbara Abdeni Massaad of Beirut surveyed this "icon to the Lebanese, a way of life" nationwide, from rustic mana'esh on a paddle near a wood-fired oven in Nabatiyah, middle right, to urbane culinary geometry at the trendy Za'tar wa Zeit (Za'tar and Olive Oil) restaurant in Beirut, opposite.



Since writing *Man'oushé*, Massaad has landed her own television show, "Helwi Beirut" ("Sweet Beirut"), and become a fixture of the Lebanese slow food movement. Exploring Lebanon's food culture with her camera and her four-wheel-drive led her to Zawtar, a southern Lebanon village with lush green fields as far as the eye can see. It is home to Mohammed Ali Naami, a farmer better known as Abu Kassem. He used to make his living collecting za'tar from the mountains overlooking the Litani River. Today he only goes to those mountains for the peace the sound of the river brings him.

Eating a breakfast of beans, olives and za'tar with his family at a table just outside

his house, he overlooks some of the two hectares (5 acres) of za'tar fields he now cultivates, planted from wild za'tar seeds. The son of a tobacco farmer, he had to quit school when he was 13, but today Abu Kassem is one of the success stories of a United Nations program to revive south Lebanon's economy after the Israeli withdrawal in 2000.

"One kilo of seeds produces 5.5 million plants," Abu Kassem explains as he walks you through the za'tar, which bursts with aroma when a leaf is torn. "In the wild, I could only collect za'tar once a year, but now I can have four or five crops a year. I'd never been anywhere before, but now I've been to Italy and Jordan and even

"It isn't sustainable, for the farmer or the crop, to depend on the wild crop," he explains. "There is a growing market for za'tar, and the wild cannot support it alone without damaging the natural habitat. When the farmers use the seeds, they

Bakeries in Polynesia, Australia and France have told me they are making mana'esh these days because of the popularity it's developed thanks to immigrants from here.

of grandmothers and other farmers—quickly tells visitors that za'tar isn't just food—it's medicine. He believes it can cure grippe, eczema, period cramps, colds, nerves, stomachaches and much more. History—mixed with tradition—is there to

back him up. "In medieval texts of the region, za'tar was believed to cure indigestion, flatulence, congestion and bad breath," says Juan E. Campo who, with his wife, Magda, teaches Middle Eastern food history at the University of California—Santa Barbara. "In fact, products

like Listerine today include thymol, which is a derivative of the same type of plant. In an ancient Assyrian text, its smell is purported to revive an epileptic."

Za'tar's power is noted in the Bible as well: "Psalm 51, verse 7, says, 'Purge me with hyssop, and I shall be clean; wash me, and I shall be whiter than snow,'" Noun explains. "Hyssop was the ancient word for za'tar," he says, adding that it is often still used in church services in Lebanon.

Za'tar also has many culinary incarnations. Certain varieties are pickled in vinegar and others often eaten fresh with slices of cheese, though they can never compete with the portability and longevity of the dried mix. Za'tar has traveled with guest workers from the Levant to other Arab countries, particularly those of the Arabian Peninsula, where bakeries manned by young Lebanese, Syrian and Palestinian men now produce mana'esh as good as any in their native lands. "I get mail from all over the world with people's personal stories about za'tar," says Barbara Mashaad, the *Man'oushé* author. "Bakeries in Polynesia, Australia and France have told me they are making mana'esh these days because of the popularity it's developed, thanks to immigrants from here."

In large, ethnically Arab communities in the US, za'tar is widely available in neighborhood Middle Eastern grocery stores. But you wouldn't think to find it in the Great Plains in the central US—lands settled by immigrant Norwegians and Germans, where brutal winters are a sharp contrast to the hot, sunny weather za'tar needs to thrive. Yet if you walk into Sanaa's, a restaurant in Sioux Falls, South Dakota, you'll find that mana'esh is at the heart of the popular Saturday lunch buffet. In the line in front of you might be people from two distinct groups of local



Libya to talk about growing za'tar as good as the wild stuff. Za'tar has given me and my family everything."

Much of south Lebanon "was an area very dependent on tobacco farming, which is not particularly good for the soil, expensive to grow, and dangerous for the women and children who often help process the leaves," says Carol Chouchani Cherfane. She works in Beirut for the UN's Economic and Social Commission for Western Asia, which did the study on the south. "We realized za'tar was a feasible crop, especially as it goes with sumac, which was another viable crop for the region. And za'tar is resilient."

Jihad Noun also worked on the project.

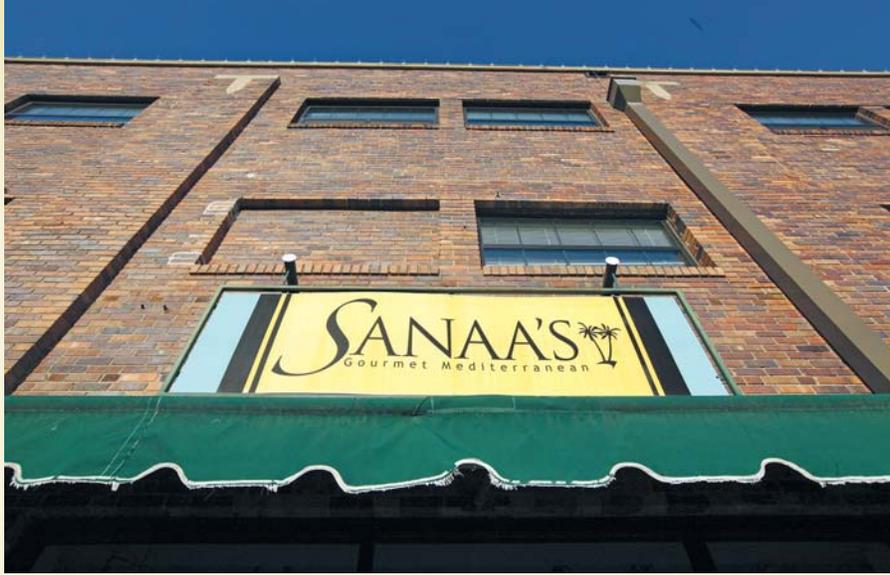
create the same taste without damage."

Noun is also working to standardize za'tar mixtures in Lebanon, as it is a cash crop for import and export. "So many factors affect the flavor of za'tar. In Jordan, for example, za'tar is cut earlier than in Lebanon—spring as opposed to summer—because of drier conditions, and that changes the flavor and color. How much salt is allowed in the mix, what are permissible additives, what is the percentage of sesame seed and sumac—these are all issues. There are laws for standardization in Lebanon, Syria and Jordan, but there is no entity effectively measuring compliance."

Abu Kassem—along with generations

Arab-Americans and even more of the descendants of those Germans and Norwegians.

Every Saturday, Sanaa Abourezk herself begins by making the dough for mana'esh. A native of Syria, she came to the US to pursue a doctoral degree in citrus farming. She already had a degree in agricultural engineering—her father's dream, so that she could help manage and improve the family's successful farm in Syria. But her soul was in cooking, and fate would lead her in that direction. Twenty years ago, she met and married former US Senator James Abourezk, an Arab-American,



Left and lower: Sanaa Abourezk first lured customers to her now-popular Sioux Falls, South Dakota eatery by sprinkling olive oil and za'tar on Pillsbury biscuits. "The customers called it 'brown bread,'" she recalls.

who returned to his native South Dakota after retiring from Washington politics in 1979. For a while, Sanaa was happy writing cookbooks that highlighted healthy, mostly vegetarian Middle Eastern food and raising their daughter, Alya, now 15. Then

one day, seven years ago, she saw a warehouse along the railroad tracks that was being turned into retail space. Without really having a menu planned out, she nonetheless decided to go for her dream, so she opened a restaurant that initially served soup and Pillsbury biscuits baked with a light sprinkle of olive oil and za'tar.

"People loved it," Sanaa recalls. "The



Abourezk keeps her best za'tar in a freezer, and she often makes the mana'esh herself, far right.

customers called it 'brown bread,' and soon I was making it with my own dough. As the menu expanded, the brown bread became an appreciated necessity of our menu."

It isn't brown bread to everyone, of course: The Dakotas actually have a long history of Arab immigration, with many coming over in the 1890's, when the area became the last region where a penniless immigrant could receive 160 acres (65 ha) of free land under the Homestead Act of 1864—provided he was willing to endure the winters. Still other Arab immigrants came as "prairie peddlers," itinerants selling to homesteaders, and some of those eventually opened their own general stores. In fact, Sanaa's husband was born on a Native American



reservation where his Lebanese parents had a store.

"There was another Arab family, the Abnors, who lived about an hour from us, and every Sunday we'd get together for dinner," the senator recalls. "We ordered our Arab food, including za'tar, from Sahadis in New York, and it would get shipped out to us. Aside from grape leaves, which my mom used to pick wild, the food I remember most is za'tar."

The former senator has his own table at Sanaa's, where he can be found every day, and where aspiring politicians and local businessmen grab seats to share political news and gossip. Members of the Sioux Falls Arab community stop by with their own za'tar experiences.

"I loved za'tar, but I didn't want my grandmother making it when I had other

kids over," recalls historian and writer Mike Saba, whose grandparents were homesteaders. "I was kind of embarrassed by za'tar. I didn't want kids asking 'What's that dirty bread you're eating?'—because that's what it looked like to others."

"Za'tar can be a very personal thing," says Sanaa with a smile. "I have my own stash."

Sioux Falls newcomers from Arab countries, mostly doctors and engineers, still go back regularly to the Levant to visit their parents and other relatives. They all bring back za'tar, as they must to survive without a Middle Eastern grocery in town. Lebanese-Palestinian Salwa Koutally, one of Sanaa's close friends, brings za'tar back for all her adult children, and when she makes mana'esh, she sends some by overnight courier to her son in New York. A doctor who has lived in Sioux Falls for 15 years says, "My sister always prepares za'tar for me to bring back when I go visit,"



Left: Son of immigrant Lebanese grocers on a Native American reservation, US Senator James Abourezk, seated, center, retired since 1979, often spends a few hours each day in his wife's restaurant.



explaining that it's because "my village has the best za'tar." "No, it doesn't," another customer interjects. "Everyone knows *my* village does!" And then—not for the first time—a good-natured argument starts about where the best za'tar comes from.

"Za'tar can be a very personal thing," says Sanaa with a smile. "It's private. Some people have their own stash of wine; I have my own stash of za'tar." The restaurant's za'tar, she confides, comes from Jordan via her Middle East food supplier in New York. But hidden in her freezer is a plastic bag of dried za'tar leaves from the mountains in Syria. Its woody, citrusy aroma hits you as soon as she opens the bag. Also nestled in the freezer is one of her favorite za'tar mixes from Damascus. There, the scent of anise is unmistakable.

"What I love about za'tar is the little surprises that make each mixture unique," says Sanaa. "For example, sometimes people add rosemary, cayenne, cumin or fennel seeds."

Sanaa favors her mother's za'tar, which contains ground roasted chickpeas. "The chickpeas were added when people couldn't afford pure za'tar," says Sanaa. "In truth, it was a good decision, because chickpeas add protein, making our breakfast even more nutritious."

Sanaa's "brown bread" is now sold at the local co-op. "It comes in on Thursday afternoon and is gone by Friday," says Molly Langley, the store's manager. It is, she adds, "a step up for food connoisseurs looking for unique and delicious options." Sanaa has also created other ways to





Today za'tar has leaped off the mana'esh and into the croissant, onto almonds and just about any other place it can be sprinkled.

be sprinkled. In Amman, across the street from Izhiman, Sufara, a giant bakery, seems to put za'tar in everything that comes out of its ovens—breads, cakes, cookies and crackers. In Beirut, any upscale

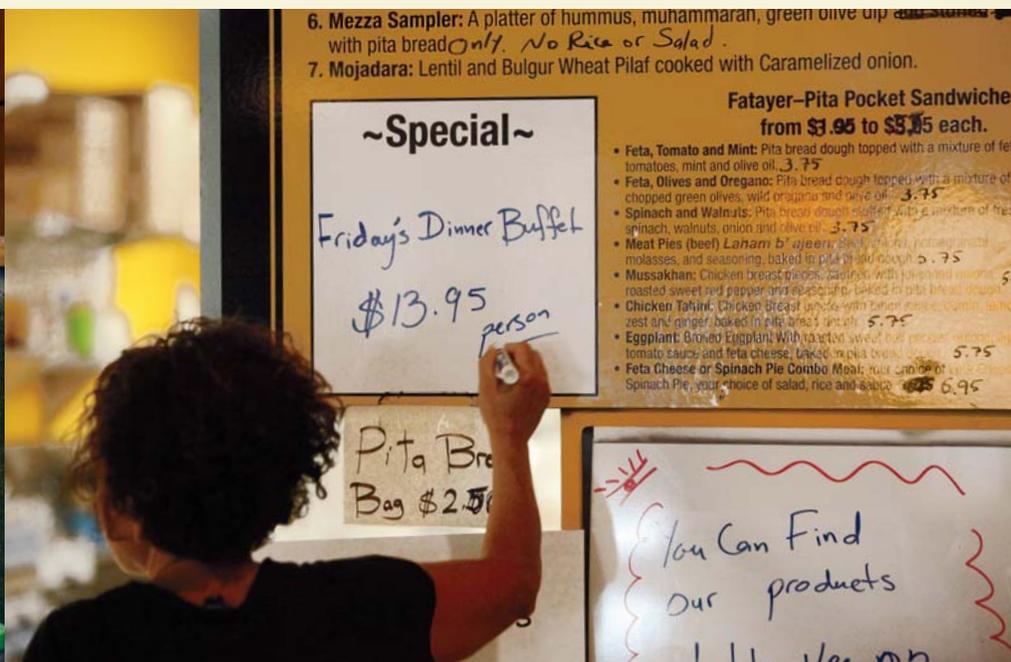
serve za'tar. On Friday nights, she tops her “brown bread” with a tomato, onion and pepper mix for a little extra kick and color, and she adds za'tar to her *fattoush* salad. “Za'tar provides that same tang, and the sesame seeds add extra texture,” she explains.

supermarket features an expanding array of products containing za'tar.

“When I said I was going to write a book about the man'oushé, people thought I was strange, but I think it was so successful because it portrayed who we are,” says Barbara Massaad. “Za'tar brings smiles.”

Back in the Levant, similar creativity is bubbling. In the past, za'tar was mostly

“Za'tar is an important regional identity,” says Carol Churfane. “It is the



Top, left to right: **Nabil Kamal Eldin** slides mana'esh into his bakery oven in Batloun, Lebanon, much as **Sanaa Abourezk** does in Sioux Falls. Above: **Izhiman** and other spice shops offer taste-tasting and custom za'tar mixing; **Sanaa** includes her popular “brown bread” on her buffet line. **Mana'esh** for sale in Amman, far left, and Sioux Falls, left.

for dipping with olive oil, for spreading on mana'esh or for sprinkling on the sesame bread rings sold by street peddlers. Today za'tar has leaped off the mana'esh and into croissants, onto toasted almonds and into just about any other place it can

Middle East Arab crop. Just look at these things I got at the Beirut airport yesterday.” She offers a tin of crunchy little tidbits—a new za'tar creation. One way or the other, za'tar always seems to find its way to the airport, and beyond. 🌍



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za'tar: M/A 88 flatbread: J/F 97

Man'oushe: Inside the Street Corner Lebanese Bakery. Barbara Abdeni Massaad. 2005, Alarm Edition, 978-9953-0-1450-0, \$35 hb.

www.canaanfairtrade.com/products/spices/
www.artisansdumonde.org



An aerial photograph of a traditional wooden sailing ship, likely a dhow, on a deep blue ocean. The ship's deck is cluttered with various items including ropes, a white life jacket, a blue bag, and a white hard hat. A person is visible on the deck near the center. The ship's mast and rigging are prominent, and the water shows a white wake from the vessel. The overall scene is bright and clear, suggesting a sunny day.

SAILING THROUGH TIME:

Jewel of Muscat

WRITTEN AND PHOTOGRAPHED BY
ROBERT JACKSON



Towering swells lift us skyward, then drop us deep into their troughs as they roll beneath our hull. Occasionally, waves strike us broadside with such force that compressed air from below rushes up through the hatches. Water pours over the starboard gunwale, cascading across the deck and down the companionways—soaking everything and everyone below. Holding fast to the rigging, crewmen stand straddle-legged at their stations against the pitching deck.

We are running eastward across the Bay of Bengal before 50-knot winds (92 kph, 60 mph), our lines taut as steel and the single storm-sail stressed to the breaking point. Any mishap now will surely invite disaster. Deafened by the blast of rain and spray against the hoods of our flapping raincoats, we hold on, hoping the 18-meter (59') ship will hold together. Finally, after more than two hours of fury, the wind and rain begin to abate. Although the storm will batter us for two more days, the worst is over. The *Jewel of Muscat* has triumphed in the greatest trial of her five-month voyage across the Indian Ocean from Oman to Singapore.

Surviving a tropical cyclone is an impressive feat for any sailing vessel. But the *Jewel of Muscat* is in a class of her own: She's

Riding out a tropical cyclone in the Bay of Bengal proved the roughest test for the *Jewel of Muscat*. Previous spread: **A view of the *Jewel of Muscat*'s deck from the top of the mizzen mast: Every plank and board is held in place with coconut fiber.**

a reconstruction of a ninth-century CE Arab ship, and her planks and frames are entirely *sewn* together, making her success all the more remarkable.

Several nights after the storm, I stand at her helm contemplating the immensity of stars that arch from horizon to horizon. We are making only two knots (3.7 kph, 2.5 mph), in water so calm that it mirrors the light of every star, and I have the sensation of flying through space. The only sounds are the slap of the water against the hull, muted conversations in Arabic, the creaking of the deck and the chirping of a cricket in the coils of rope behind my feet. It is June 2010, but the ship is a time machine, carrying us centuries into the past.

We had set sail from Oman's capital, Muscat, some three and a half months before, but our journey really began on an ordinary day in 1998, when two divers searching for a new bed of sea cucumbers two kilometers (1.2 mi) off Belitung Island, Indonesia, spied something much more valuable on the seafloor, some 17 meters (55') down. Clustered in a low mound, half buried in sand, were stacks of Chinese pottery, large, heavily concreted

When the storm caused a crack in the main mast, the crew splinted it with some of the spare rope and wood that was carried on board for just such emergencies.

jars and the eroded ends of wooden beams. The divers had discovered the remains of a fully laden Arab merchant ship dating back some 1200 years. The oldest shipwreck ever found in the Indian Ocean, it offered the earliest and most comprehensive evidence of direct seaborne trade between the Arabian Peninsula and Persia in the west and China in the east.

Excavation of the “Belitung wreck” revealed 60,000 pieces of ceramics and other artifacts. These included the earliest intact examples of Chinese blue-and-white ware, a small but priceless collection of silver and gold objects, a fine assembly of “green-splashed” ware and a bowl from Changsha in south-central China bearing the inscription, “the sixteenth day of the seventh month in the second year of Baoli era”—that is, 826 CE. The nature of the cargo indicated that the ship had begun its homeward voyage in the Chinese port of Guangzhou (Khanfu in Arabic). This fits in well with the findings of Robert Harding of Cambridge University, who writes that the Chinese began to

The oldest shipwreck ever found in the Indian Ocean, the “Belitung wreck” offered the earliest and best evidence of direct seaborne trade between the Arabian Peninsula and Persia in the west and China in the east.

export high-quality ceramics to the Middle East during the Tang Dynasty (618–907) and that Muslim merchants began their own voyages to China in 807.

Once fully loaded, the ship had embarked on a journey linking the world’s two leading powers, the Tang Dynasty, with its capital at Chang’an (modern-day Xi’an), and the Abbasid Empire (750–1258), ruled from Baghdad. The

ship’s likely destinations: Siraf in southern Iran or Basra at the head of the Gulf. It was the longest maritime trade route in history, stretching some 12,000 kilometers (7500 mi), until the Europeans arrived in the Indian Ocean in the 15th century.

The Belitung wreck and its cargo offered an unprecedented opportunity for historians to discover more about early trade between the Middle East and Asia, as well as the shipbuilding and navigation of the period. In 2005,



recognizing that the wreck was an immensely important archaeological discovery, the government of Singapore purchased for \$32 million the entire assemblage of artifacts from the New Zealand company that had done the initial salvage work and immediately began meticulous analysis of the finds.

Belitung Island lies about 620 kilometers (300 mi) south-east of Singapore, which itself is on the southeast side of the Malacca Strait—long a key passage for trade. After purchasing the cargo, Singapore opened diplomatic and academic channels to take full advantage of the cultural, historical and political opportunities created by the discovery. The government’s primary partner in this endeavor was the Sultanate of Oman, on the southeastern corner of the Arabian Peninsula, a country with an illustrious maritime heritage.

Oman’s Ministry of Foreign Affairs agreed in 2008 to fund construction of a ship based as precisely as possible on the

Belitung wreck. Sultan Qaboos bin Sa’id, the ruler of Oman, took a keen personal interest in the project, naming the vessel the *Jewel of Muscat* and decreeing that, once built, the ship would be a gift from Oman to the people of Singapore. In response, Singapore agreed to construct a special museum to display it.

To ensure that the vessel met the highest standards of authenticity and quality, the Omanis invited Australian maritime archeologist Dr. Tom Vosmer, the world’s leading authority on the history of Arab shipbuilding, to head the construction team. They aimed not only to reconstruct a ninth-century Arab ship, but to document its sailing characteristics and durability by sailing it across the Indian Ocean. Both tasks were fraught with challenges.

Attempting to construct an authentic, seaworthy ninth-century ship in the 21st century was certainly daunting. Unfortunately for

Captain Saleh al-Jabri uses one of the ship’s several kamals, which helped navigators for millennia determine latitude using star altitudes. (Until the 18th century there was no way to determine longitude.) “This voyage was my greatest challenge in 25 years at sea,” he says.





The strength of the ship depended on the integrity of its stitching. Every seam was sewn and packed with coconut-fiber wadding and every drill-hole was sealed using a traditional Indian Ocean putty of chalk, resin and fish oil.

modern historians—but to the great credit of traditional shipwrights, who built their vessels entirely by eye—virtually no plans, records or written descriptions of Arab shipbuilding exist from earlier than the 20th century. A serious design flaw that a shipwright would have spotted instantly 12 centuries ago might not be apparent even to the most knowledgeable modern naval architect today, with potentially disastrous consequences at sea.

The Belitung wreck was helpful to some extent, but only about 20 percent of the original vessel remained sufficiently exposed on the seafloor for excavators to examine. Close analysis of the wreck revealed that its timbers were predominantly *Afzelia africana*, a dense hardwood that flourished along the East African coast in the ninth century and was ideal for shipbuilding. In addition, every structural component of the vessel—frames, through-beams and planks—was entirely stitched together in the manner of traditional western Indian Ocean ships dating back at least two millennia. The planks were joined edge to edge, carvel-style, and cross-stitched directly through the plank-ing, with wadding on both sides of the seam. These characteristics assured Vosmer that the Belitung wreck was of northwest Indian Ocean provenance.

Beginning in October 2008 in the coastal village of Qantab, southeast of Muscat, Oman, the team of shipwrights and archeologists took 17 months to build the *Jewel of Muscat*.

Missing information about its design and structure had to be gleaned or inferred from historical texts, iconography and extant examples or photographs of Arab sewn-plank boats. This information was analyzed and integrated using the latest naval-architecture software. Ultimately, Vosmer and fellow Australians Nick Burningham and marine archeologist Dr. Mike Flecker, the excavator of the Belitung wreck, arrived at a computerized design that reasonably incorporated the evidence they had on hand—with the final result resembling a large-scale variation of an indigenous Omani boat known as a *battil*.

Professionals in Britain built two approximately 1:10 scale models of the ship based on this design, and Vosmer tested them—one in a towing tank and the other in a wind tunnel—at Southampton University. Ship design has developed gradually over thousands of years, by a sometimes painful process of trial and error, and these tests were crucial to the project's success.

Investigators found design weaknesses in two areas and rectified them before ever setting sail. First, they altered the shape of the stern so that it curved less abruptly, reducing drag and increasing efficiency. Second, the distance between the main mast and the mizzen (or rear) mast was increased because the original design would have resulted in the mizzen sail “shadowing,” or blocking the wind from the mainsail. This added distance enabled crewmen to work the two sails together more efficiently.

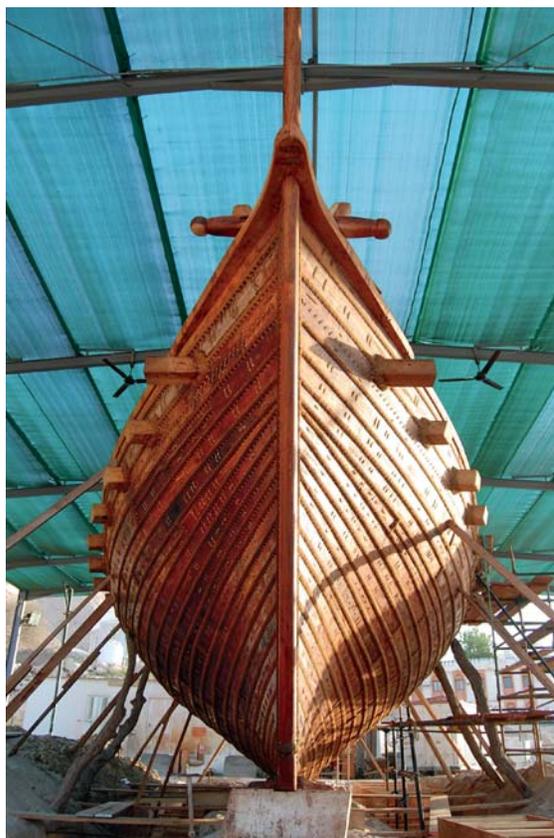
Vosmer's handpicked team of highly skilled Omani and Indian shipwrights and carpenters, and Italian and American maritime archeologists, began building the ship in October 2008 in the Omani coastal village of Qantab, just southeast of Muscat. For the next





17 months, the men endured intense heat and tackled successive design challenges as they worked to rediscover and put into practice the knowledge and techniques employed by ninth-century Arab shipbuilders. Given the paucity of documentation, constructing the *Jewel of Muscat* required a constant and exhausting cycle of theorizing, experimentation and analysis.

Construction also required 15 tons of *Azelia africana* (harvested in Ghana, since the tree no longer grows on the East African coast), five tons of teak and several tons of other types of wood. “We were in awe of the people who, over a thousand years ago,



Above: Built hull first, the ship required more than 20 tons of wood, shaped by hand. Left: Each hull plank had to be steamed to fit it to just the right curve. “We were in awe of the people who, over a thousand years ago, felled, transported and processed these massive [Azelia] trees,” says Tom Vosmer. “The labor intensity was staggering.”

felled, transported and processed these massive [Azelia] trees,” Vosmer said. “The labor intensity was staggering.” To tie it all together, the construction crew used 130 kilometers (80 mi) of handcrafted coconut-fiber rope, hundreds of liters of coconut and shark oil to waterproof the planks and the stitching, and impressive amounts of skill, determination and enthusiasm.

In the interest of authenticity, crewmen used traditional hand-tools, including saws, adzes, chisels, hammers and such simple measuring devices as the *qalam*, used to mark parallel lines on planks. Among the few concessions to modern technology

was the use of electric drills rather than the traditional *migdab*, the hand-powered Arab bow-drills: The latter are ingenious and highly effective devices, but they proved 10 times slower than electric drills. Given that 37,000 holes had to be drilled in the hull to accommodate the stitching, and that the builders were working under a tight deadline to catch the winter monsoon winds, the decision to compromise was understandable.

A key construction challenge that Vosmer and his team had to resolve was how to shape the planking. Like all Arab ships of its time, the Belitung vessel was built hull first. This is the opposite of traditional western construction techniques, in which the frame is built first and the planks are then bent and fixed to the ribs.

They aimed not only to reconstruct a ninth-century Arab ship, but to document its characteristics by sailing it across the longest maritime trade route of its era.

The hull-first approach requires that the planks be twisted or curved *prior* to being attached to one another. After numerous experiments, the team built a wooden steam box that, in two hours, rendered the five- to seven-meter-long (16½ to 23') planks flexible enough to be fitted into their appropriate place on the hull. The builders had to carry out the task quickly because the wood remained pliable for only

a few minutes after coming out of the box. Despite this, the system worked, and as each level of planking was added, the graceful form of the hull emerged.

Binding the planks together was as important as properly shaping them. Once the holes were drilled in the planks, they had to be sewn together with precision, for the strength of the ship depended entirely on the integrity of the stitching. Inspection of the Belitung wreck revealed that a row of coconut-fiber wadding had been added to each side of the seams. Then it was stitched over with rope.

At first, this system appeared to render the stitching more vulnerable to abrasion. And in fact, centuries later, Arab shipbuilders had indeed done away with exterior wadding and instead countersunk the outside stitches to reduce the dangers of abrasion, and perhaps reduce drag. But the builders of the *Jewel of Muscat* remained true to the older method, and the team soon learned its advantages. For example, the exterior wadding added cushioning to the stitches and the seam itself and, once saturated with fish oil, it provided a thicker barrier against seawater.

The rope workers operated in pairs, one inside the hull and one outside. Using the simplest of tools, including a large wooden

At mealtimes, the 17-man crew from nine nations sat on the deck around communal trays and ate simple food, such as rice and dried fish prepared in a traditional wooden cook-box, or *matbakh*.



marlinspike and a mallet, and small wooden plugs to temporarily lock the stitches in place, one man threaded cordage through the holes drilled in the planks, applied just the right amount of tension, and then passed the rope over the wadding and through the hole to his partner on the other side. The level of tension on the rope was critical: too much and it would snap; too little and the seal between the planks would leak. When stitching was complete, each hole was carefully plugged with densely wadded coconut fiber, and then sealed with a traditional Indian Ocean putty made from chalk, resin and fish oil.

Once the challenges of reconstructing the Belitung vessel were met, the second phase of the project commenced. On February 16, 2010, the *Jewel of Muscat* glided out of Muscat's Mutrah harbor and into the open ocean, her 17-man multinational crew led by Omani captain Saleh al-Jabri. During our slow, hot passage to India and beyond, we gradually embraced the arduous but simple rhythm of life at sea.

At mealtimes, we sat on the deck around communal trays

Lower: Accommodations stayed true to ninth-century standards—with the exception of plastic sheeting to deflect leaking seawater. Right: *Jewel* was built with both a pair of tiller-steered quarter-rudders and a rope-driven central rudder: In the ninth century, the former represented a traditional method while the latter was new technology.



A crewmember wraps protective baggywrinkle on the manila-fiber rigging where it might wear holes in the sails made of woven palm fronds.

and ate simple food such as rice and dried fish prepared in a traditional wooden cook-box, or *matbakh*. When the winds dropped to near zero and the temperature and humidity soared, we learned to accept our helplessness in the face of nature. We marveled at majestic sunsets and rejoiced—as have all sailors over the centuries—at the sight of dolphins playing off our bow. We also discovered that despite differences in language and culture and the hardships of cramped space, limited sleep and enervating heat, we could unite as a crew and work toward a common goal. We hailed from nine nations—India, Sri Lanka, Malaysia, Singapore, Italy, Australia, the US and the UK, as well as Oman—but we learned to respect each other's talents and experiences, and appreciate the role that each

man played in the success of the voyage.

Among our many tasks at sea was documenting the effectiveness of the ship's most essential features. For example, a key question Vosmer and his team had faced during the *Jewel of Muscat's* design and construction was what type of sails she would carry. The Belitung wreck left no evidence of rigging, so Vosmer delved into early texts and iconography for clues. His research suggested that the Belitung ship would have carried square rather than triangular lateen sails. This ran counter to the generally held belief



A spectacular dawn off the Malaysian coast heralded *Jewel's* approach to the Malacca Strait, the world's busiest shipping lane.

that Arabs used lateen or settee sails—a lateen sail with a small section of the front corner cut off—beginning in the fourth century BCE.

In the 15th century CE, Vosmer noted, the famous Arab mariner Ahmad ibn Majid wrote that the constellation Pegasus, which has the general shape of a square, resembled the proportions of an Indian Ocean sail. Furthermore, numerous drawings of Indian Ocean ships dating from the mid-12th through the 16th century depict Arab ships with square sails. Notably, several show a crow's nest atop either the main or mizzen mast, a feature impossible on a lateen-rigged ship because it would prevent switching the yard from one side of the mast to the other when the ship tacked or wore across the wind.

Once at sea, we discovered just how practical square sails were. Not only were they easier to handle when tacking or wearing, but—when properly trimmed—we could sail as close as 51 degrees to the apparent wind (the combination of “true wind” and the wind created by the forward motion of the ship). This meant that under the right conditions we could “harness” more wind and sail with greater efficiency and speed than anticipated—perhaps one of the reasons square sails endured for so long on Indian Ocean ships.



Another critical question concerned the type of steering system the *Jewel of Muscat* would use. A particularly fascinating aspect of the Belitung ship was that it was built during a time of technological transition in maritime design. For millennia before the ninth century, ships used quarter rudders—long rudders fixed to each side of the hull—to steer. Each was controlled by its own tiller. When the ship was on a starboard tack (i.e., with the wind coming from the right), the helmsman used the port rudder, and vice versa. But around the ninth century Arabs began fitting a single, central rudder to the sternpost of their ships.

Sailors are understandably conservative when it comes to innovation, tending to stick to what's tried and true, and textual and iconographic evidence shows that the complete transition to this new type of rudder took about three centuries. So builders outfitted the *Jewel of Muscat* with both systems and, when used properly, they complemented each other quite well—perhaps explaining why ancient mariners waited so long before fully switching over. In very light winds the central rudder proved most effective, while in light to moderate winds the quarter rudder worked best. In high wind and rough seas, we often used both systems simultaneously, with the median rudder offering an additional degree of control.

Perhaps the most important technical revelation from the voyage was that, contrary to most early European observations, sewn-plank ships can be remarkably strong. Writing in the 15th century about sewn ships from Hormuz in Persia, Marco Polo stated:





The vessels built at *Ormus* are of the worst kind, and dangerous for navigation, exposing the merchants and others who make use of them to great hazards. Their defects proceed from the circumstance of nails not being employed in the construction... [T]hey are bound, or rather sewed together, with a kind of rope-yarn stripped from the husk of Indian nuts [coconuts]....

Our experience contrasted sharply with this claim. Indeed, the *Jewel of Muscat* proved to be structurally stronger than the designers anticipated. She endured numerous severe storms during the voyage—especially in the Bay of Bengal—but suffered no damage to her hull. She was also subjected to the modern indignities of being towed into and out of ports, bumped and jostled by heavy tugboats while docking, and exposed to pollutants in congested harbors, yet she remained unscathed.

Despite our commitment to maintain as much historical authenticity during the *Jewel's* voyage as had been applied to her construction, we were compelled for safety reasons to navigate with the

greater precision afforded by a GPS—using satellites rather than stars for direction. This device requires little skill to use, and we were constantly humbled by how well early sailors had navigated without it. Arab mariners began to use a compass in the 13th century, not long after it had become standard equipment for western ships. Prior to that, they employed a simple but ingenious instrument called a *kamal*—basically a rectangle of wood to which a string with fixed knots is attached. Held at arm's length, with its lower edge on the horizon, the *kamal* was used to measure the altitude of a given star (especially the Pole Star) from the horizon and thus determine latitude. They did not, however, have a reliable method for determining longitude.

The remarkable 15th- and 16th-century texts of the great Arab navigators Ibn Majid and Sulaiman al-Mahri explain how ancient sailors observed the sun, currents, wind, sea color and sea life to help them navigate by day. They also reveal that the navigators' astonishingly detailed knowledge of the heavens was their primary means of navigation by night. Dr. Eric Staples, an American maritime historian and a member of the crew, studied these documents prior to and during our voyage. To learn as much as possible about the use of the *kamal*, and to compare modern measurements with those found in the old texts, he employed several versions of the device to create a database of the altitudes of 14 stars and constellations traditionally used by Arab navigators.

Using a *kamal* takes considerable practice even under ideal conditions, but it won't work on cloudy nights or during storms. Fortunately, our voyage proceeded more peacefully after the tempests of the Bay of Bengal, so we were able to take more regular star readings. Day after day we glided eastward toward Penang, Malaysia, our penultimate port of call, and then south through the Straits of Malacca—taking care to avoid Sumatran pirates and

the supertankers that ply the busiest shipping lanes in the world.

Finally, 138 days after setting out, we sailed into Singapore's harbor to a rapturous welcome by thousands of well-wishers, colleagues and friends, followed by receptions hosted by Omani and Singaporean dignitaries, and the official handover of the *Jewel of Muscat* by Captain al-Jabri to Singaporean President S. R. Nathan.

"This voyage was my greatest challenge in 25 years at sea, but it was also incredibly rewarding in terms of what we learned about Arab maritime history," Captain al-Jabri said.

Amid all the chores involved in readying the ship for arrival, there was time to reflect on the meaning of the voyage. It had been a grand adventure, and we had learned a great deal about ancient Arab ships and sailing. But, above all, our experiences had kindled an intense respect for the knowledge, skills and courage of the ancient Arab mariners in whose wakes we had sailed.

In the ninth century, without a compass but with a hard-won understanding of the sea, the winds and the stars, they crossed the vastness of the Indian Ocean, uniting people and nations in commerce, faith and friendship. This was the real legacy of the *Jewel of Muscat*, one that she will continue to share with her visitors for many generations to come. 🌐



138 days after setting out from Oman, the *Jewel of Muscat* arrived in Singapore, where she has been donated for permanent display at the Maritime Experiential Museum.



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THE POINT OF THE ARCH

WRITTEN AND PHOTOGRAPHED
BY TOM VERDE

ABOVE GROUND, THE EIGHTH-CENTURY CISTERN OF RAMLA, ABOUT AN HOUR SOUTHEAST OF TEL AVIV, DOESN'T LOOK LIKE MUCH: LONG ROWS OF WHITE-WASHED HUMPS OF RUBBLE, LIKE RAISED GARDEN BEDS, DOTTED WITH HOLES THROUGH WHICH ONE CAN DROP A BUCKET ON A ROPE. EVEN ITS ARABIC NAME, BIR AL-'ANIZIYA ("POOL OF THE GOATHERDS"), UNDERSOLLS IT. WITH A CLOSER LOOK, HOWEVER, ITS IMPORTANCE QUICKLY BECOMES EVIDENT, AS WELL AS THE REASON IT IS ALSO KNOWN AS "THE POOL OF ARCHES."

"Watch your head," the caretaker advised me, tapping the low ceiling of a lichen-crusting stairwell that led down to the cistern's chamber, flooded with cloudy, blue-green water. Shafts of sunlight streaming through the access holes ricocheted off



The pointed arches at the Cistern of Ramla were commissioned in 789 CE by the Abbasid Caliph Harun al-Rashid.

the water's surface, casting wriggling reflections on a cavernous network of arches, each one elegantly curved upward from its pillars to a pointed apex. Technically known to art historians and architects as "ogival" or simply "pointed" arches, these were built in 789 CE, making them among the oldest such arches in Islamic architecture, and their use here, at that time, signaled a turn in the history of architecture.

The change was both esthetic and structural. Compared to its predecessor—the semicircular "Roman arch"—the pointed arch gracefully tapers at a variety of angles, and its greater height admits more light. Structurally, a pointed arch can generally support up to three times as much weight as a Roman one, and was one of the key architectural features that allowed

the builders of western Europe's great medieval cathedrals to raise their walls and ceilings to dizzying heights, thereby creating the vertiginous Gothic style. Those builders owed much to Ramla's cistern and to other structures throughout the Arab world, where the pointed arch made its appearances centuries before it entered the architectural lexicon of Europe.

But how? How did the soaring interiors of Chartres, Sens, Salisbury and dozens of other Gothic buildings descend from what was essentially a flooded basement in a sun-baked Arab town?

To answer that question, I tracked the pointed arch across five countries and as many centuries—a journey that began at the trail's end, in the city where Gothic architecture was born: Paris.

“I don’t mind being shot at” is how Alistair Northedge summarized his dedication to the pursuit of archeological treasures in remote and sometimes dangerous corners of Iraq, Afghanistan and other political hotspots across the Middle East. I met him in the comparatively peaceful setting of his office at the Institut National d’Histoire de l’Art, adjacent to Paris’s famed Bibliothèque Nationale. Tracking down the origins of the pointed arch would be tricky, Northedge told me, because there is disagreement over whether or not some of the oldest examples—such as the sixth-century Great Arch of Ctesiphon at the Sassanian palace of Taq-e Kisra in northern Iraq, or the equally old Byzantine church at Qasr ibn Wardan in Syria—are true pointed arches or merely parabolas, precursors to the pointed arch.

“You can see some early doorways, for example, where the arch is pointed,” Northedge observed, “but I’m not sure these could be described as a deliberate esthetic, whereas it’s clear that it does become a deliberate esthetic in the Umayyad period in the first half of the eighth century.”

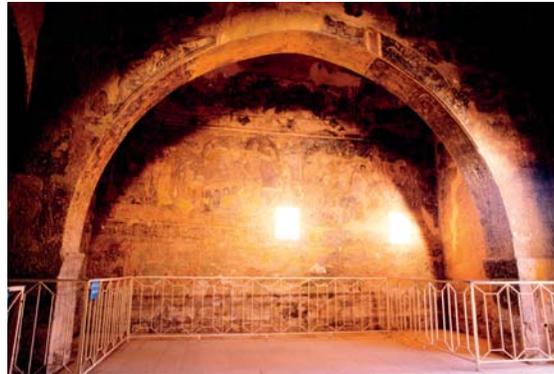
In Northedge’s estimation, some of the earliest instances of the pointed arch are in Jordan’s famed “Desert Castles” such as Qasr al-Kharanah and Qusayr ‘Amra, built in 710 and 715, respectively, in what was then Umayyad-ruled Syria.

“The [pointed] arches there are quite slight, but you can see that they are composed of two different arcs with centers that are crossed over,” he explained. Whereas a rounded arch has a single center, a pointed arch has at least two. The distance between the centers determines the angle at which the two sides meet at the arch’s apex—its “pointiness.” Good old-fashioned grade-school geometry helps to illustrate: Imagine a drafting compass, with the spike placed midway on a straight line. Moving the pencil from one end of the line to the other produces a semicircular arc with a single center. But moving the spike to a spot to one side of the midpoint and drawing an arc, then moving the point to the other side of the midpoint and drawing a second arc creates two arcs that intersect: a pointed arch.

While rounded arches are unquestionably sturdy enough for countless Roman aqueducts and triumphal arches, they weaken with height, because they direct the weight they support outward, toward the walls. The higher the arch, the stronger

and thicker the walls need to be, and walls could only be so thick before becoming ridiculously impractical and expensive. Pointed arches, however, direct much of the thrust of weight downward, toward the ground, and they can thus support much thinner, higher walls.

That the pointed arch indeed traveled from East to West is hardly unknown to art historians, archeologists and architects. In the words of the famed English architect of the late 17th and early 18th century, Sir



The gentle point in the arch at Qusayr ‘Amra, which dates from 715, may have been as much a decorative device as a structural one.

Christopher Wren, the designer of St. Paul’s Cathedral in London, “This we now call the Gothic manner of architecture.... I think it should with more reason be called the Saracen [Arab] style.... If any one doubts of this assertion, let us appeal to any one who has seen the mosques and palaces of Fez or some of the cathedrals in Spain built by the Moors.”

Generally dismissed at the time, Wren’s insights were vindicated by later architectural historians, including W. R. Lethaby (1857–1931), author in 1904 of *Medieval Art*, one of the first art-history textbooks to be used on college campuses. “There is much more of the East in Gothic, in its structure and fibre, than is outwardly visible,” Lethaby wrote. “It is not generally realised in how large a degree the Persian, Egypto-Saracenic and Moorish forms are members of one common art with Gothic.”

The speculation that it was Crusader knights, returning from the East, who introduced knowledge of the pointed arch to Europe was a popular outgrowth of this view. But the theory had its skeptics, including an eccentric Oxford student by the name of T. E. Lawrence—later known as “Lawrence of Arabia”—who concluded in his 1908 undergraduate thesis that there was “no evidence” that Crusaders “borrowed anything great or small,

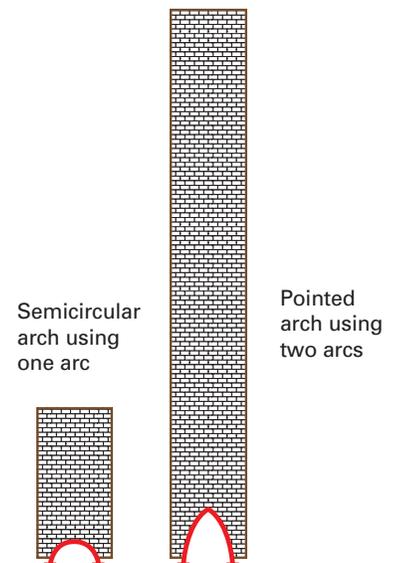
from any fortress which [they] saw in the Holy Land.”

Among the earliest modern proponents of the theory of the pointed arch’s Eastern origins was the redoubtable K. A. C. Creswell. Born in London in 1879, Creswell was the American University in Cairo’s first professor of Islamic art and architecture, and he is generally considered a founding father of the discipline. His multivolume *Early Muslim Architecture* and equally ponderous *Muslim Architecture of Egypt* occupy nearly a meter of shelf space.

A draftsman by training, Creswell conducted his research with an engineer’s eye, photographing, cataloging and painstakingly measuring monuments from Egypt to the Euphrates. In his opinion, “the evolution of the pointed arch” could be determined “by the gradual separation of the two centres.” Charting this evolution by comparing the fractional differences between the spans of various arches throughout the Middle East, he concluded that the pointed arch was “of Syrian origin” and that “no European examples are known until the end of the eleventh or the beginning of the twelfth century.”

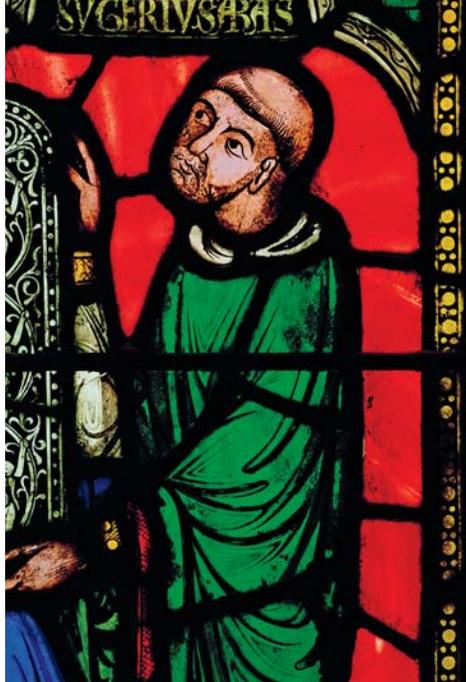
Research such as Creswell’s is the best evidence historians have to go on, said Northedge, since the history of the arch in the Arab lands is written exclusively in stone. “They [early Muslim architects] left no written records of their architecture,” he sighed.

From Northedge’s office, it is a short distance to the place where the masons of Europe’s great Gothic cathedrals took their



A pointed arch, right, can support up to three times as much weight as a semicircular arch, left.

For Abbot Suger of St. Denis in Paris, the pointed arch served both engineering and philosophy. An image of the abbot, right, appears among the many stained-glass windows that illuminate the abbey church of St. Denis, below.



first cues from the pointed arches, and the overall design, of the abbey church of St. Denis, famed both as the birthplace of Gothic architecture and as the home of the man who served as its midwife, Abbot Suger.

Born in 1081, Suger seemed destined for life at St. Denis, where he was deposited at age 10 by his impoverished family as an “oblate”—essentially a human donation. Educated at the abbey alongside the future King Louis VI, Suger became abbot in 1122. By then, the crumbling, eighth-century abbey church was in dire need of both repair and expansion. In 1135, Suger began a building program, in league with architects whose names have been lost, that was to transform the church’s dim Romanesque interior into something brightly illuminated, airy and utterly new. His design brought together for the first time what became the prime elements of Gothic architecture: pointed arches, the flying buttresses that allowed the arches to support still more weight and ribbed vaulting, another eastern innovation. The result was a jaw-dropping interior with soaring ceilings and gravity-defying walls composed of more stained glass than stone. Sunlight streaming through these windows bathed the vast interior in a “crown of light,” as Suger described it, and played a symbolic, theological role in the abbot’s overall architectural scheme.

“The dull mind rises to truth through that which is material and, in seeing this light, is resurrected from its former submersion,” he observed. In other words, light served a mystical purpose, elevating the

earthbound human mind and soul closer to the Divine. This was a belief first articulated by the Neo-Platonists of late antiquity, whose teachings Suger admired, particularly those of the fifth-century Syrian Christian theologian known as Dionysius the Areopagite, who viewed God’s presence “as fontal ray, and stream of light ... shining upon every mind.” Two centuries later, a similar metaphor was revealed in the Qur’an (24:35): “God is the Light of the heavens and the earth. The parable of His light is as if there were a niche and within it a lamp: the lamp enclosed in glass: the glass as it were a brilliant star.... Light upon Light! God doth guide whom He will to His light.”

Like his philosophical views, Suger’s designs for St. Denis had deep roots. In his biography of Louis VI, he left a clue as to where he may have picked up the inspiration for his church: It was during a mission for the king to Cluny Abbey, in southern Burgundy. The year was 1130, just five years before work began at St. Denis.

The trip from Paris to Cluny, which probably took Suger a little more than a week on horseback, took me about four hours by train. Nonetheless, I still arrived about 200 years too late. A casualty of the anti-religious fervor of the French Revolution, much of the abbey was dismantled in the late 18th century and sold off, stone by stone, to local builders. Yet Cluny’s renown still attracts visitors, just as it did when it was medieval Europe’s largest church and the headquarters of the powerful and influential Benedictine suborder of Cluniac monks.

Like St. Denis, Cluny had a creative and ambitious abbot, Hugh of Semur, and his renovations of the abbey known to historians as Cluny III began in 1088 and continued after his death until 1130—the year of Suger’s visit. While most of Cluny III is gone, bits and pieces survive, with help from restorers, including several 30-meter-high (nearly 100’) pointed arches that played a crucial role in the story of the arch’s journey from East to West.

“Here you can see the way that the arches opened up the church and made it full of light,” said my guide, Matthias Mai, as we entered. A series of clerestory windows in the exterior walls, together with round “bull’s-eye” windows in addition to the arches, admitted so much light that the effect was, as Abbot Hugh’s contemporary biographer wrote, “a place where the dwellers on high would tread.”

My gaze followed the trajectories of the arches up to their clearly distinguishable pointed apexes. At the time of Suger’s visit, there were some 200 such arches lining the nave, side aisles and transept. The impact could not have been less than stunning.

Today, flat-panel video screens throughout the abbey offer tantalizing computer-generated views of what he may have seen: a church not yet fully Gothic, but clearly departed from the Romanesque.

“Abbot Hugh was one of the great builders of all time,” the driving force behind “[t]he expansion of Cluny into the Ile-de-France, where the admirably organic and articulated Gothic style arose,” wrote the late art historian Kenneth J. Conant, who made the study and excavation of Cluny his life’s work.

So if Cluny’s pointed arches inspired Suger, and thereby all of Gothic architecture, how had Hugh come to know of them?

“He understood engineering and knew what he was doing,” said Mai. “He was one of the most educated and intelligent men of his time.”

And well traveled, too. In 1083, five years prior to renovating Cluny, Hugh visited an Italian abbey whose abbot just happened to have a taste for Near Eastern architecture: the Benedictine Abbey of Monte Cassino, about 130 kilometers (80 mi) southeast of Rome.

The World War II-era mortar shells, bullet cartridges and battered helmets on display in the lobby of my hotel didn’t quite square with its name, Hotel la Pace (Peace Hotel). They were,

however, fitting reminders of the Battle of Monte Cassino, when the famous abbey, looming above the town on a solitary, rock-bound hill, was leveled by Allied bombs as a suspected German stronghold. (A tragic mistake: It wasn't.) That marked the fifth time Monte Cassino had been attacked and destroyed, following Lombards in 589, Muslims in 884, Normans in 1030 and an earthquake in 1349.

Thus, there are even fewer remains here than at Cluny, aside from some decorative 11th-century floors, a Roman-era tower and a chapel dedicated to St. Benedict, the founder of both the abbey and the most powerful monastic order in medieval Europe. After World War II, although



At the time of Suger's visit in 1130, Hugh of Semur's 30-meter arches at Cluny Abbey numbered more than 200.

the abbey was completely restored in the Baroque style of its last incarnation, bits and pieces of the medieval building survived as traces of its architectural connections to the East. The aforementioned decorative floors, for example, are laid out in colorful, geometrically random Cosmatesque patterns—patches of squares, diamonds and hexagons—that were modeled on Byzantine floor mosaics in Syria, Palestine and Egypt. The massive, paneled bronze doors of the main church, etched with the titles of the abbey's vast land holdings, dependencies and donors, were custom-made in Constantinople at the behest of abbot Desiderius, who renovated Monte Cassino between 1066 and 1071. As Europe's leading center for manuscript production and the headquarters of the Benedictine order, the abbey was then at its zenith of influence

and wealth. The worldly and well-traveled Desiderius could thus afford to import more than just exotic building material from the East. As abbey librarian Leo of Ostia noted in his contemporary account of the renovation, Desiderius "sent envoys to Constantinople to hire artists who were experts in the art of laying mosaics and pavements" as well as working in "wood, alabaster and stone."

Considering the geographic origins of these artisans, Conant and others have suggested that there may well have been Muslims among them. The presence of Muslim engineers and masons in the medieval work crews of the Christian West was not unheard of. During the Crusades and the Christian *reconquista* of Muslim Spain, many Muslim prisoners of war ended up in France, Rome and Constantinople, as the late scholar John H. Harvey observed.

"Among the prisoners there must have been a substantial body of Moorish military engineers," Harvey wrote, "and it may be supposed that the victors would make use of their knowledge and their improved techniques." According to a Welsh chronicle, one prisoner even rose to become royal architect for England's King Henry I: a

"GOTHIC"

The term "Gothic" was never used by Suger or his contemporaries to describe architecture. It was coined, instead, by Renaissance-era Italians who tended to look down their aquiline noses at anything non-Roman, especially an architectural style associated with the French and German descendants of the Goths who were responsible for pulverizing the glory that was Rome. Indeed, before the term "Gothic" came into common use, the pointed-arch style was known simply as *opus francigenum*, or "French work." Because of its defining verticality, it was also called "perpendicular," a term introduced by the Victorians.

captive "from the land of Canaan, of the name of Lalys, a man eminent in the art of masonry, who constructed the most celebrated monasteries, castles, and churches in the country...and taught the art to many of the Welsh and English."

Whether or not the renovations carried out by Desiderius's imported craftsmen—Muslim or otherwise—included pointed arches is still a matter of debate among scholars. Conant believed they did. On a visit to the abbey before World War II, he noted the presence of pointed arches dating to the Middle Ages in a side chapel. He further speculated that Monte Cassino served as the model for the church of St. Angelo in Formis in Capua, also built by Desiderius, which features pointed arches in its entryway. Putting aside doubt for many is Leo of Ostia's account, which described the porticoes of the main church as having *fornice spiculos* ("slightly pointed arches"). Leo also left clues as to when and where Desiderius may have first set eyes on a pointed arch. In 1065, the abbot made what was essentially a shopping excursion to Amalfi, one of medieval Europe's busiest maritime gateways to the trading cities of the Islamic world.

Today a picture-perfect Italian resort town, Amalfi lies at the mouth of a deep ravine on the southern slopes of the Sorrento Peninsula, a lava flow of honey-colored stucco houses and red-tiled roofs spilling down to the Bay of Salerno, around 70 kilometers (45 mi) southeast of Naples. While Desiderius probably journeyed there by ship, I opted for a rental car to navigate the coastal road, a zigzagging, cliff-side strip of tarmac overlooking the dangerously distracting beauty of the Tyrrhenian Sea.

"[No city] is richer in silver, gold and textiles from all sorts of different places," wrote the poet William of Apulia in the late 11th century, around the time of Desiderius's visit. "[M]any different things are brought here from the royal city of Alexandria and from Antioch. Its people cross many seas. They know the Arabs, the Libyans, the Sicilians and Africans. This people is famed throughout almost the whole world, as they export their merchandise and love to carry back what they have bought."

Among Muslims, Amalfi's reputation was no less exceptional. In his *Book of Routes and Kingdoms*, the 10th-century Turkish geographer Ibn Hawqal praised the city as "the most prosperous town in Lombardy, the most noble, the most illustrious

on account of its conditions, the most affluent and opulent.”

This mutual admiration was rooted firmly in commerce. From as early as the ninth century, the tiny republic of Amalfi, though nominally a Byzantine state, was in regular commercial and diplomatic contact with Muslim powers, including Abbasids, Fatimids, Umayyads and more, from the Black Sea to the shores of the Iberian peninsula. The most important port in the western Mediterranean, Amalfi was rivaled only by Venice as a conduit for the exchange of goods between East and West. With chests full of *tari*—locally minted quarter-dinar coins inscribed in Arabic—and cargo ships bulging with lumber, linen and local produce, Amalfitan merchants traded for oil, wax, spices and gold in the ports of Arab Sicily, North Africa, Syria and Palestine. Trolling the bazaars of Constantinople, they bartered gold for jewels, perfumes, art objects and precious textiles, such as purple silk, which had to be smuggled out of port, as it was illegal to export the imperial cloth from Byzantium.

“The people of Amalfi were the first who, for the sake of gain, attempted to carry to the Orient foreign wares hitherto unknown in the East,” wrote the archbishop William of Tyre in the 12th century. “Because of the necessary articles which they brought thither, they obtained very advantageous terms from the principal men of those lands and were permitted to come there freely.”

The eastern cities, from Baghdad to Cairo to Tunis, maintained thriving merchant colonies under local protection and, in return, adopted a similarly accommodating, laissez-faire attitude toward its trading partners. When the Vatican led a campaign in the ninth century to expel the Arabs from southern Italy, Amalfi refused to cooperate and even provided safe harbor for Arab ships. Though it frustrated the Pope and alienated the stubborn republic from other Italian municipalities, the gambit paid off: When Arab armies later besieged southern Italy, Amalfi was left untouched. Twelfth-century geographer and world traveler Benjamin of Tudela stated: “The inhabitants of the place are merchants engaged in trade, who do not sow or reap, because they dwell upon high hills and lofty crags, but buy everything for money, ...and no one can go to war with them.”

Except nature. In 1343, an underwater earthquake and tidal wave swept half of the city into the sea, and it never fully recovered. Thus, what had once been the center of town, the Piazza Duomo (Cathedral Plaza), now abuts the harbor. Still, the Piazza remains the city’s main gathering place, with its tourist shops, gelato parlors and fountain. But the city’s true heart and soul, even overshadowing the Piazza, is the Cathedral of St. Andrew, restored in 1891 to its original 13th-century Arab–Norman Romanesque glory. A riotous blend of Moorish stripes (*ablaq*, in Arabic, meaning

Though Leo of Ostia wrote of the “slightly pointed arches” on the portico of the embattled abbey of Monte Cassino, right, they have not survived. Remaining floor tile decoration, lower, nonetheless testifies to the stylistic influences, if not the actual handiwork, of masons and artisans from the Levant.



“particolored”), glittering mosaics and pointed arches, the façade is as clear a statement as you will find that Amalfi’s imports from the Islamic world amounted to more than silks and spices.

“[T]he artistic influences exerted by the Muslim world on southern Italy were a concrete part of [its] political and economic history,” wrote Islamic art historian and current New York Museum of Modern Art director Glenn Lowry in a 1983 monograph *Islam and the Medieval West*. “Consequently, ...Islamic art played a major role in the formation of southern Italy’s vocabulary of forms. Its impact was both prolonged and profound.”

It certainly had an impact on Desiderius as he ascended the towering steps of the cathedral then under construction. He had come to Amalfi to shop for a gift for

the future Holy Roman Emperor, Germany’s King Henry IV, in hopes of winning the young monarch’s favor for Monte Cassino. Browsing the city’s retail inventory of imported treasures, Desiderius settled on some of the aforementioned contraband purple silks as an appropriate buttering-up gift for a rising king, together with some silver vessels for the church. But according to Leo of Ostia, something else struck the abbot’s fancy as well: “Desiderius saw the bronze doors of the cathedral of Amalfi and as he liked them very much, he soon sent the measures of the doors of the old church

on Monte Cassino to Constantinople with the order to make those now existing.”

The doors that greet visitors to the cathedral today date to an earlier, ninth-century church, the Basilica of the Crucifix, that stood adjacent to the one Desiderius saw being built. Unusually, the newer church was connected to the older

one as an expansive addition, resulting in a six-aisled cathedral with a forest of columns and arches that “rendered the sacred building more similar to an Arabic mosque than to a Christian church,” according to one church history. The basilica still stands, though now separated from the main cathedral. During the 18th century, both were redecorated in the Baroque style, but a restoration of the basilica in the mid-nineties revealed what art historians believe are the 10th- and 11th-century pointed arches along the nave. Above the arches, a double row of lancet windows framed with pointed arches lines the upper gallery, where women worshiped. The accuracy of the restoration is confirmed by an early 17th-century mural in the crypt that shows the basilica’s interior prior to the Baroque makeover. This was the church that Desiderius would have seen, and quite possibly the arches that might have inspired him, along with the bronze doors, to incorporate similar features at Monte Cassino. Once more, Leo of Ostia provides evidence for this supposition by mentioning that, in addition to builders from Constantinople, Desiderius hired Amalfitans as well as Lombards.

Ambling through the basilica, I took note of the pointed arches in the nave, as well as some smaller ones that are easy to miss, tucked into the segmented sections, or squinches, of a semi-spherical “melon”

dome above the stairs leading down to the crypt. Dating to the time of the new church's construction, the dome's arches may have been "a conscious allusion" to St. Andrew's Middle Eastern origins, Lowry speculated, and were "typical of North African and Egyptian architecture.

"This can be seen in the mausolea of Aswan and Cairo," he continued, "as well as in more elaborate buildings such as the Qubbat Barudiyan (ca. 1120) in Marrakesh. Indeed, the common association of squinches and melon domes with funerary monuments in the Muslim world makes it reasonable for us to assume that both the forms and their context were familiar to the many Amalfitans who had traveled and lived in the Middle East."

I let the startling significance of that statement sink in for a moment. What Lowry was suggesting was that the builders of St. Andrew's Cathedral not only copied Islamic architectural features, but emulated their specific uses in religious settings as well. This was more than imitation—it was wholesale adoption. That such spiritual and intellectual empathy existed between Christians and Muslims during an era often overshadowed by the brute hostility of the Crusades is underscored by a letter, cited by Lowry, written in 1076 from Pope Gregory VII to the Algerian amir An-Nasir ibn Alnas. In brotherly tones, Gregory acknowledged their shared reverence for the prophet Abraham and recognized that "we believe in and confess, albeit in a different way, the one God." Even more telling, Lowry noted, was that Gregory wrote his letter in response to the amir's request to send a bishop to care for the local Christian population.

Leaving the basilica by a side door, I entered an adjacent courtyard, appropriately named the Cloister of Paradise. Had I been deposited unconscious in this sublime space, I would have sworn, upon waking, that I was in a palace in Andalucía, Morocco or Tunisia, so characteristically Islamic was its design. Built between 1266 and 1268 as a cemetery for Amalfi's ruling merchant class, the courtyard features a central garden and palm trees enclosed by low walls supporting 120 slender, white marble



Top: Though built in the mid-13th century, the interlacing pointed arches of the cloister at Amalfi's Basilica of the Crucifix highlight the enduring appeal of Islamic designs in the port city. Above: A 17th-century fresco in the basilica's crypt shows the building as Desiderius likely saw it in 1065—including the pointed arches that inspired his work at Monte Cassino.

columns, arranged in pairs. Springing from the tops of the columns, in bas-relief, are so-called "interlacing" pointed arches whose arcs intersect like rings of water from pebbles tossed into a pond.

Moving on from this tranquility to the jostle of Amalfi's tourist-choked streets at dusk, I noted further evidence of the influence of Arab architecture. The narrow, white-washed, covered alleyways and winding passages reticulating the town strongly resembled those of Tunisia's historic Sidi Bou Said, roughly 300 nautical miles to the southwest. So striking was the similarity

that you could fancifully imagine that one town simply broke off from the other, just as their respective continents did some 500 million years ago.

Following the direction of all roads, I ended up at Amalfi's harbor. Though I could not see the lights of Africa twinkling on the horizon, I could imagine them, together with the creaking, square-rigged merchant ships returning from her shores, their holds redolent with spices, piled with chests of jewels and silks. Yet

these ships also transported something more lasting: ideas that changed the face of western architecture. Thus far, the trail of those ideas, specifically the pointed arch, followed a clear geographical and chronological path northward from southern Italy to France. It was no less clear that the pointed arch was a novelty unknown in the West until at least the 10th century, a device and a style inspired by the architecture of the East, and perhaps, in some cases, even crafted by Muslim masons who had ended up in the West by war or commercial contract.

By the time those masons were putting the finishing touches on the arches of Amalfi's basilica, a graceful arcade of similar arches had been a familiar feature

of another house of prayer for nearly a century: the Great Mosque of Mahdia, along Tunisia's Sahel coast, where the trail would lead me next.

"A dagger held in the fist" was how Ibn Khaldun, the 15th-century Tunisian-born historian, once described the strategic peninsula of Mahdia, which juts into the Mediterranean about 250 kilometers (150 mi) south of Tunis. Indeed, the tip of the dagger's blade points east, straight at one of the

"Had I been deposited unconscious in this sublime space, I would have sworn upon waking that I was in a palace in Andalucía, Morocco or Tunisia, so characteristically Islamic was the design of Amalfi's Cloister of Paradise."

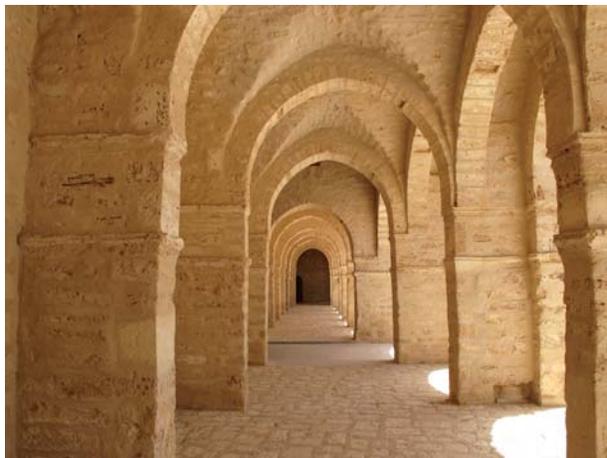
region's most perennially coveted prizes: Egypt. In the early 10th century, the man wielding more than metaphorical daggers was 'Ubaidallah, founder of the Fatimid dynasty. This rogue general assumed leadership of Tunisia by ousting the Aghlabids, the Muslim rulers of North Africa and Sicily for the past century and the nominal representatives of the Abbasid caliph in far-off Baghdad. More concerned with trade than military matters, the Aghlabids proved no match for 'Ubaidallah's army and ambition. A capable, albeit ruthless, ruler—he assassinated those who helped him to power, and theologians and lawyers with whom he disagreed were publically flogged—'Ubaidallah styled himself the *mahdi* (“chosen one”), the redeemer of Islam. That this was heresy did not deter him, and the city he built on the strategic peninsula he dubbed Mahdia in reference to his self-anointed title.

In 1916, 'Ubaidallah ordered the construction of Mahdia's Great Mosque on the narrow isthmus connecting the peninsula to the mainland. Much of the original mosque has been destroyed, rebuilt and/or restored on several occasions, with the critical exceptions of the sections I had come to see: the main entryway and arcade.

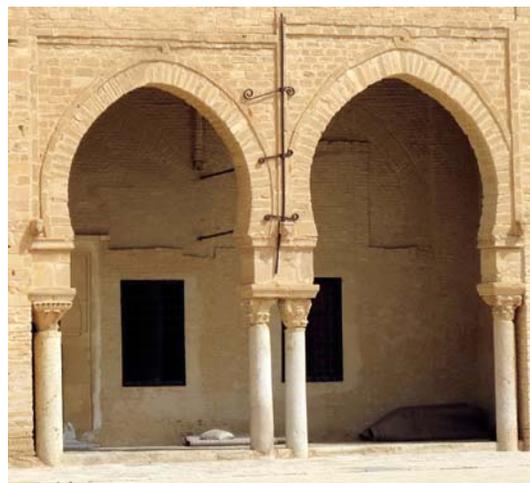
Stepping through the entryway once reserved only for the ruler and his entourage, I crossed into an aisle of pointed arches surmounted by groin-vaulting formed by the joined tips of quadrilaterally opposing pointed arches. The structure looked as if it could have come from any Gothic church in Europe—but it had been built at least a century before the style was ever dreamt of there. Was it possible that some mason who shaped the golden limestone blocks supporting these arches later also traveled to Amalfi? Could some Muslim merchant, telling tales of home or bragging of the beauty of his city's houses of worship, have described this very place to an intrigued European audience? Or perhaps it was an Amalfitan merchant who passed this way, possibly along this very arcade, who shared the

news back home that the buildings across the water were more stunning than anything he had seen at home. The lack of documentary evidence makes it impossible to say, yet the fact remains that by the early 10th century, here in this Arab port routinely known to Amalfitan merchants, the pointed arch was established and prominent.

As I stood there, mentally transported back to that distant century, a bent and sun-bronzed elderly man jolted me back



Above: **The Great Mosque of Mahdia, Tunisia, built in 916, was likely known to Amalfitan merchants. Its builders, in turn, would have known well the Great Mosque of Kairouan, right, where arches date from the early to mid-ninth century.**



to this one. Ibrahim Nouri, the mosque's custodian, was pleased to know I had an interest in the building's history, and pointed out to me the literal joint in time where the original mosque ended and the restored one began.

“This kind of building could not be created again,” he said with matter-of-fact reverence. The reason, he assured me, was that “it was built by faith,” implying that there may have been more to the use of the arch than simple mechanics.

The faith Nouri spoke of inspired the creation of what remains North Africa's holiest city, some 130 kilometers (80 mi) inland: Kairouan.

Founded in 670 by the Arab general Oqba ibn Nafi on his march across North Africa, this desert city, whose name literally means “halting place,” was laid out as a military camp with two structures at its center: a mosque and the commander's residence. Though nothing survives of Oqba's mosque, the current Great Mosque of Kairouan was built in the early to mid-ninth century, which makes it one of the oldest Muslim houses of worship in the world as well as the model for all subsequent North African mosques.

Surrounded on three sides by the crenellated walls of Kairouan's historic old city, the mosque resembles a fortification from the outside, with high walls and a tapering, quadrangular minaret that is believed to date to 730—a century or so earlier than the rest of the mosque and perhaps the world's oldest standing minaret. The western entryway, encased within an enormous buttress, provided but temporary shade between the sun-baked old city and the mosque's sun-drenched open courtyard, or *sahn*, enclosed by a double-bayed arcade. Three sides of the arcade feature the slightly pointed, horseshoe arches common to the

Islamic architecture of Morocco and southern Spain. But the southern portico, fronting the prayer hall, differs both chronologically and esthetically. Built about 40 years before the rest of the mosque, in 836, its acutely pointed arches flank both ends and the entryway of the prayer hall. I learned why the architects chose this particular application of pointed arches from modern architect Mohammad el Hedi Belahmar of Tunisia's National Heritage Institute who, as luck would have it, happened to be at the mosque that day conducting surveys.

“The idea was to focus attention on the entrance to the prayer hall, to make a statement that the entry porch was important,” Belahmar told me. It also provided visual balance, he said, with eight rounded bays anchored on either end by pointed arches solving the problem of how to even out the space. The use of the pointed arch in North Africa was fairly new at the time this mosque was built, Belahmar said, and the arches' distinctive shape suggested to him a Persian influence or origin that, over time, was Arabized in form and name.

“In French they are called *arc brisé*, and in Arabic, *kaous munkassar*, which both mean ‘broken arch,’” he said. As for their

appeal to early Muslim builders, Belahmar saw it as “basically an engineering solution, to provide greater strength to buildings.”

Later that evening, I heard a different opinion from another architectural authority, Lotfi Abd Eljaoued, director of Kairouan’s Museum of Islamic Arts. “Essentially, pointed arches opened up buildings to create fountains of light,” Eljaoued told me, as we sat poolside in the lantern-lit twilight at Kairouan’s La Kasbah Hotel, a restored fortress in the heart of the medina. “Light was important. If you look at inscriptions of the names of God in mosques, many of them refer to Him in terms of light.”

Surah 24 of the Qur’an, *Al-Noor* (“Light”) is one example, while, according to Muslim tradition, one who recites the name of God *Al-Aleem* (“The All-Knowing”) will literally become “enlightened” with divine understanding. Such interpretations of the concept of light sounded much like those of Abbot Suger, and they started me thinking that there may have been more going on all along in the use of the pointed arch than simple mechanics. Still, Muslim masons never used the pointed arch to reach the dramatic heights of Gothic cathedrals. While the one may have inspired the other, the reason for this distinction was, literally, fundamental.

“From early on, Christian church architecture was identified with the basilica, which is a long and tall building type, whereas Islamic architecture saw its beginnings in the courtyard house structure, which is low, broad and encompassing,” according to medieval Islamic art specialist Yasser Tabbaa, visiting professor of art history at NYU–Abu Dhabi. “Some later mosques, whether Ottoman or Persian, did aspire to height—the former by domes, the latter by *iwans* [high-vaulted, three-sided entrance spaces], for example—but none required stabilization by the use of flying buttresses.”

In 969, inspired not so much by light as the desire for land and wealth, the Fatimids wrested from the hands of its Abbasid governors the land at the end of the Mahdia peninsula’s dagger point: Egypt.

One of those governors had been the man responsible for the next monument on the trail of the arch: the eponymous Mosque of Ibn Tulun, in the city the Fatimids renamed Cairo.

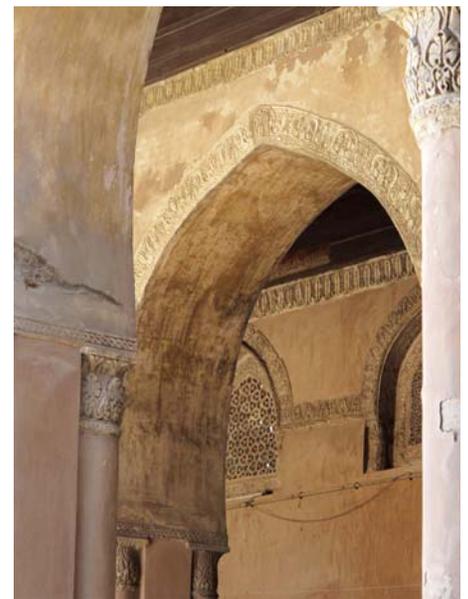
Born in 835 as the son of a Baghdad slave, Ibn Tulun rose through the ranks of the Abbasid military to a position of power in Samarra, Iraq, then a flourishing center of art and architecture under the caliph al Mu’tasim. Assigned in 868 to serve as regent of Fustat, then the Egyptian capital, Ibn Tulun expanded and enriched the city with public-works projects, including a hospital and an aqueduct. Ambitious as well as civic-minded, he declared independence from Baghdad within two years of his appointment and established his own dynasty, the Tulunids. A new regime required a new capital, and so Ibn Tulun transformed an area north-east of Fustat into a spectacular government center called al-Qata’i (meaning “the wards” or “the quarters”), with a palace complex, gardens and a *maydan* (public square) vast enough for him and his court to play polo. At the

center was Ibn Tulun’s crowning achievement: a mosque complex of unprecedented size (2.5 hectares/6.5 acres). The design of Ibn Tulun’s city complex and mosque reflected the ruler’s Samarran heritage and taste. Built of red brick faced with stucco, the mosque features intricate decorative plasterwork in vegetal motifs and a minaret with a spiral, exterior staircase reminiscent of Samarra’s famous Malwiya (“snail shell”) minaret. High double walls surround the mosque, creating a serene and peaceful environment inside. In the area between the walls, called a *ziyada*, teachers gathered to discuss the Qur’an, theology, astrology, medicine and more. When discussions and throats ran dry on hot summer days, a fountain in the courtyard dispensed cool lemonade. A near-continuous strip of Qur’anic verses can still be seen along the interior walls, carved into wooden beams salvaged, legend has it, from the wreckage of Noah’s Ark.

“Pointed arches opened up buildings to create fountains of light.... If you look at inscriptions of the names of God in mosques, many of them refer to Allah in terms of light.”

Providing shape and grandeur to the overall structure, however, are dozens of brick piers supporting the prayer hall and enclosing the courtyard, topped by row upon row of elegant, pointed arches. Stories associated with the construction of the mosque link these features to yet more Islamic–Christian cooperation. According to the 10th-century Egyptian historian al-Balawi, when Ibn Tulun learned that his new mosque would require 300 columns that could only be obtained by gutting local churches, the ruler “thought this wrong, and would not do so.” Hearing of this, a Coptic Christian prisoner, who happened to be an architect, offered to design the mosque without stone or marble columns, opting for brick piers instead. Ibn Tulun was “so pleased that he set him free and entrusted him with the work.”

While Coptic Christians may have been involved in the construction, the design of the mosque, most art historians agree, is decidedly Islamic, and specifically Samarran, whose style favors brick piers. Whether the mosque’s pointed arches were likewise patterned after earlier Syro–Iraqi examples—such as those mentioned to me by Northedge—is a question I put to Bernard O’Kane, professor of Islamic art and architecture at the American University in Cairo, as we strolled through the mosque in our stocking feet. A trim, bespectacled man whose Irish brogue remains unwithered after 30 years in the city, O’Kane echoed Northedge’s precautions against definitive answers to what inspired the use of the



In the mosque of Ibn Tulun, built in the later ninth century, pointed arches rise from brick piers similar to those commonly used in Ibn Tulun’s native Samarra, Iraq.

pointed arch among Muslim architects. He did acknowledge, however, that the objective of filling structures with symbolic light, as Eljaoued had conjectured, was a tempting explanation.

“The Fatimids, for instance, named their mosques after epithets of light,” O’Kane pointed out, rattling off several local examples. “Al-Anwar was the original name of the mosque of al-Hakim, meaning ‘shining with splendor.’ Al-Azhar means the same thing. Al-Aqmar means ‘the moonlit mosque.’ In their choice of Qur’anic verses in the mosque, they also frequently picked those that were related to light. So the concept of enlightenment, or giving light, is important.”

Despite its inspiring interior and historical importance, the Mosque of Ibn Tulun actually takes a chronological backseat to a far less conspicuous, subterranean bit of engineering nearby, on Roda Island in the middle of the Nile: the Nilometer.

Built in 861, the Nilometer measured the height of the annual Nile flood—an important function that foretold whether the coming year would bring feast or famine. The structure is simple: a 13-meter (40’) stone-sheathed hole in the ground with a graduated column in the center for measuring the depth of the water. But halfway down the pit, there is a set of wall recesses vaulted with Egypt’s oldest surviving pointed arches.

“Careful measurements show that the pointed arches of these recesses have been struck from two centres one-third of the span apart,” observed Creswell, in his characteristically clinical style. “That is to say these arches are what the Gothic architects called ‘tiers-point’, but they are three centuries earlier than any Gothic example.”

Now blocked up, the niches once served as sluices for the Nile’s floodwaters. The

arches don’t appear to serve any critical structural function and were thus probably decorative. It is possible that the Nilometer’s designer, Persian astronomer Abu’l ‘Abbas Ahmad ibn Muhammad ibn Kathir al-Farghani, simply incorporated the arches as a contemporary architectural feature. Whatever the motive, it makes clear that by the mid-ninth century, the pointed arch had, in effect, gone viral across Egypt and the Maghreb, and would be on its way to southern Italy within a century or so after that. But this trend began further east, back along the path of Islam as it spread west from the Arabian Peninsula. A major crossroads on that journey was Islam’s third holiest city after Makkah and Madinah—Jerusalem.

The Dome of the Rock, with its shining gold-sheathed roof and azure tiles, is one of the world’s most recognizable buildings. Indeed, it’s an architectural synecdoche not only of Jerusalem, but of the entire Middle East. Together with the nearby Al-Aqsa Mosque, it comprises al-Haram al-Sharif, “The Noble Sanctuary,” from which Muslims believe the Prophet Muhammad ascended to heaven during his miraculous “Night Journey.” A shrine, not a mosque, the structure surrounds the massive rock where Muhammad was taken up, where Jesus taught and where the temples of Solomon and Herod once stood.

Though both its interior and exterior have been embellished and restored throughout the centuries, the Dome of the Rock’s octagonal framework, with two concentric rings of arched colonnades encircling the rock, remains the same as that decreed by Umayyad caliph Abd al-Malik, who had it built between 688 and 691. It is the world’s oldest Islamic building, and inside it are what some say are the oldest pointed arches in Islamic architecture.

Yusuf Natsheh, in charge of archeology at the shrine, granted me permission to visit the structure in the company of Ahmad Taha, director of Al-Aqsa’s Islamic Museum. The building is noted for its mathematical perfection: Each outer wall, for example, is as long as the dome is wide and as high from the base: 20 meters (67’ feet). The sumptuous interior is awash in glittering mosaics, marble paneling and painted woodwork, while the arches of the inner colonnade, those supporting the dome, are striped by alternating light and dark stone (*ablaq*, as in Córdoba’s Great Mosque and the façade of Amalfi’s cathedral), and they are, ever so slightly, pointed.

The overall impression is actually that of some gloriously gilded Byzantine interior. Taha explained why.

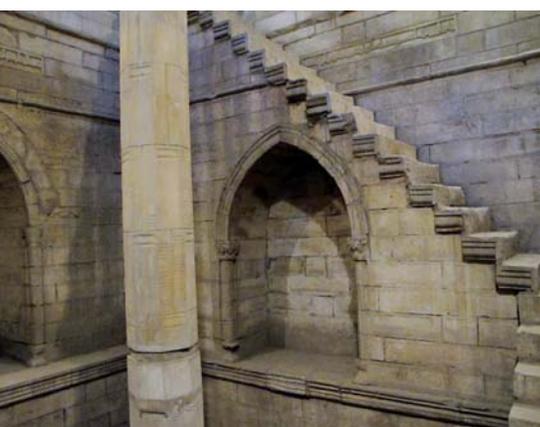
“The Umayyads imported Christians as workers and administrators,” he said. “So there are many Byzantine elements, because the artists and workers who made the mosaics were Byzantine, Syrian Christians.”

Were these same workers responsible for the Dome of the Rock’s pointed arches? Possibly. The pointed arch is not a common feature of Byzantine architecture, but it does have Syrian precedents, as Creswell wrote and Northedge suggested. But why its use in this particular time and place, I wondered? Throughout my journey, I had been hearing both practical and philosophical motives for the arch’s development. It was here that the two merged.

On the purely functional level, the pointed arches were a solution to a technical problem. In any circular colonnade, the arch openings on the exterior face are larger than those on the interior face because the radius of one is larger than the other by the thickness of the wall. This means that the underside surfaces of the arches (the intrados) tilt inward, rendering them visually unbalanced. Builders of the Dome of the Rock corrected this problem by pointing the interior sides of the arches to raise the intrados to a uniformly horizontal level. (Builders averted this problem in the outer colonnade by making it octagonal. Today, the arches of both sides of the inner colonnade are pointed, owing to a later restoration.)

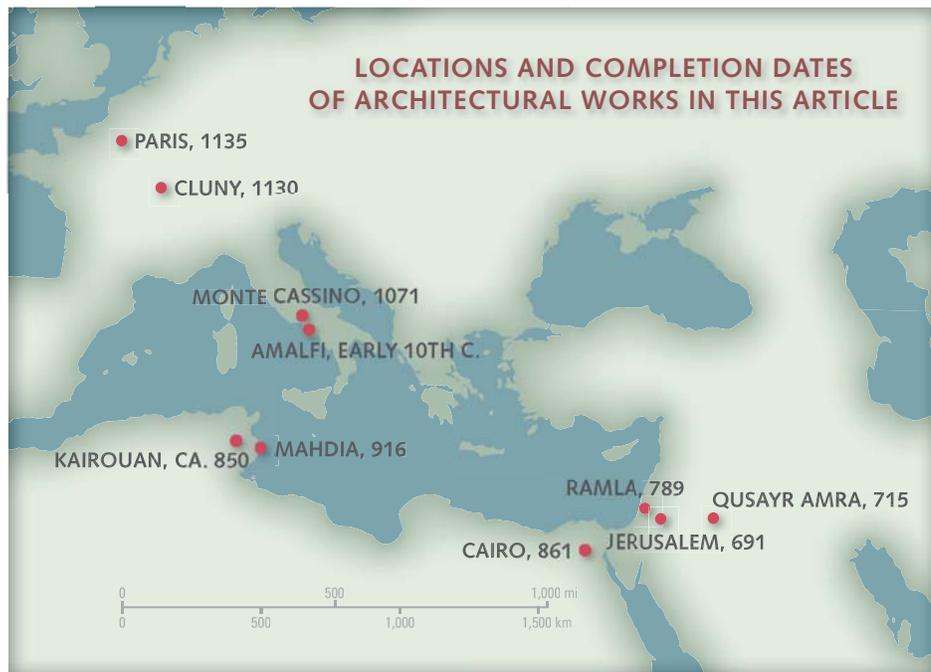
Yet there may have been a deeper motivation. The Dome of the Rock, art historians generally agree, was a declaration of Islam’s triumph over (or, to Muslims, fulfillment of) both Judaism and Christianity. This was made clear by virtue of its location and design. Modeled after Byzantine churches in general and the nearby Church of the Holy Sepulcher in particular, the Dome of the Rock was intended to outclass them all while defining the new faith. A prominent inscription featuring verses from the Qur’an (4:171) directly underscores the theological distinctions between Islam and Christianity: “For God is One God: Glory be to Him: Far exalted is He above having a son.” In the midst of these bold ornamental pronouncements, how did a simple upward nudge in an arch make a statement?

“[G]iven the seminal position of this building in the early history of Islamic architecture, we need to consider the possible role of the adoption of the pointed arch in starting to establish, in architectural terms, a cultural identity for the new



The sluice-gates of the Nilometer, built 108 years before the founding of Cairo, are the earliest known pointed arches in Egypt.

LOCATIONS AND COMPLETION DATES OF ARCHITECTURAL WORKS IN THIS ARTICLE



remains more difficult to pin down. This was because during the Middle Ages, as Lowry wrote, “the intensity of the contacts between the [West] and the Muslim world were not static, but dynamic, changing from one mode of artistic influence to the next.”

And just as the Christian West had adopted the pointed arch from the Islamic East, so too did Islam acquire cultural vocabulary from Persia, Byzantium, India, Asia, Africa and even Europe. With this in mind, Natsheh summarized the history of Islamic art for me by paraphrasing his former professor (and Creswell’s contemporary academic rival), the late Ahmad Fikri.

“Students of Islamic art think of Islamic art as a smart and beautiful child,” he said with a smile. “But this child’s eyes are from Rome, his hands are from Persia, his legs are from Coptic Egypt. And so all of these elements mixed together, to come up with a good, smart boy.”

religion,” wrote architectural historian Peter Draper, author of *The Formation of English Gothic*.

Was this the “deliberate esthetic” Northedge spoke of at the beginning of my journey? Perhaps. Still, the conventional view is that the Dome of the Rock’s pointed arches date from a later time or, if they are original, were simply “on-the-ground corrections,” with no loftier significance, as NYU-Abu Dhabi’s Tabbaa characterized them. Either way, they would ultimately become “a distinguishing feature” of Islamic architecture, according to Draper: a trend that may have begun here in Jerusalem, in the far-flung fortresses and hunting lodges of Umayyad princes in Jordan’s eastern desert as Northedge suggested, or in a less conspicuous locale, roughly 30 miles northwest and about 10 meters (30’) underground.

So it was that I ended up paddling around the translucent, sun-dappled waters of the Cistern of Ramla in a fiberglass dinghy. The boat’s beamy cockpit offered the best vantage points for close-up views of the arches, erected here—so says a Kufic inscription on one wall—“with God’s blessings” and at the command of Caliph Harun al-Rashid, “in the month of Hajj, in the year One Hundred and Seventy Two” (May 789 CE). As such, the cistern is not only a uniquely remaining Abbasid monument, but “constitutes the earliest known example of the systematic and exclusive employment of the free-standing pointed arch,” according to Creswell’s own

The points of the arches on the inner colonnade of Jerusalem’s Dome of the Rock, built between 688 and 691, are subtle, but they both solved an architectural problem and helped begin to distinguish Islamic from Byzantine Christian styles.

emphasis. Graceful and perfect, the arches spring from the surface of the water in a series of bays, forming six symmetrical aisles, as if in some flooded and long-forgotten Gothic church. Such a pity, I thought: All that work for something rarely seen even in its own day, considering that most visitors to the cistern came merely to fill their water buckets from above rather than admire the engineering work of art below.

Yet Ramla represented “a new type of language of architecture,” as Draper put it. While earlier, scattered examples throughout the Middle East may have been the first utterances of this new language, the pointed arches at Ramla represented its first fully formed sentences. This language would grow and spread over the ensuing centuries, culminating in the epic architectural poetry of medieval Europe’s Gothic cathedrals.

In my quest to establish a chronology for the pointed arch, I discovered that while the physical feature can be traced from place to place, as an idea its route



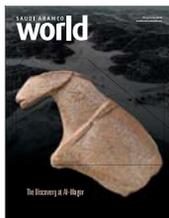
If so, one of the most profound movements in the history of art—the Gothic—owes its genes to this clever child. 🌐



Freelance writer **Tom Verde** (writah@gmail.com), a frequent contributor to *Saudi Aramco World*, holds a master’s degree in Islamic studies and Christian–Muslim relations. He dedicates this story to the memory of his teacher, advisor, mentor and friend, the late Ibrahim Abu-Rabi, with whom he has shared many journeys.

 **Related articles** from past issues can be found on our Web site, www.saudiaramcoworld.com. Click on “indexes,” then on the cover of the issues indicated below.

Ctesiphon arch: J/F 03, J/F 68
Jordan’s desert castles: S/O 90
imperial purple: J/A 06, N/D 98
Sidi Bou Said: S/O 92
Fustat: M/A 12, J/F 05
Nilometer: M/J 06, S/O 85, M/J 7606



FOR STUDENTS

We hope this two-page guide will help sharpen your reading skills and deepen your understanding of this issue's articles.

FOR TEACHERS

We encourage reproduction and adaptation of these ideas, freely and without further permission from *Saudi Aramco World*, by teachers at any level, whether working in a classroom or through home study.

—THE EDITORS

Curriculum Alignments

To see alignments with us national standards for all articles in this issue, click "Curriculum Alignments" at www.saudiaramco-world.com.

Professional Development Workshops

The Middle East Policy Council, an independent, non-partisan educational organization, offers free Professional Development Workshops to help K-12 educators understand the geographical, political and human complexities of the region and to provide valuable teaching resources. MEPC will design a workshop to give your school, organization or conference innovative tools and strategies for teaching about the Middle East and Islam. For information, e-mail Barbara Petzen at bpetzen@mepc.org with your name, school or organization, phone number, and subject and grade taught. MEPC has also developed a companion Web site, TeachMiddleEast.org, with background essays and lesson plans.

Julie Weiss (julie.w1@comcast.net) is an education consultant based in Eliot, Maine. She holds a Ph.D. in American studies. Her company, Unlimited Horizons, develops social studies, media literacy, and English as a Second Language curricula, and produces textbook materials.

CLASS ACTIVITIES

Welcome to this month's Classroom Guide. We're calling it the Reality TV Edition. Why? Because the articles in this issue of *Saudi Aramco World* seem well suited to it! We'll walk you through the steps of "translating" a magazine article into a different format: a reality TV show.

Reality TV

What makes a good reality TV show?

Reality shows are all over television. But what makes a reality show a good reality show? If you watch any of these shows, think about and make some notes about what you like about them. For example, do you like them because there's a hero you're rooting for and/or a villain you don't like? Do you like the suspense? Do you (dare we say it?) like the ones where you learn something? (If that sounds like an oxymoron, check out the Web site for *The 1900 House*.) If you don't watch such shows, do an Internet search to see what other people say makes for good reality TV. Make some notes about what you find. Then divide the class into three groups and share with your group your ideas about what makes for a good reality show. Generate a list of qualities, or elements. These will be the building blocks you'll use to invent your own show.

Defining the Topic of Your Reality Show

It might surprise you to know that several articles in this month's *Saudi Aramco World* provide some juicy subject matter for reality TV. It's all in how you look at them. Try reading these articles looking for what's exciting and entertaining. Assign each of the groups one of the following articles: "Sailing Through Time: *Jewel of Muscat*"; "The Point of the Arch" and "Discovery at Al-Magar." On your own, read the article you've been assigned. As you read, keep in mind what you identified as making a good reality show, and keep an eye out for these elements in the article.

Finding the Elements to Make Your Reality Show

Make a two-column chart with your group. In the left-hand column, list the elements of reality TV shows that you identified earlier. In the right-hand column, write where you find these elements in your article. For example, reality TV shows often have moments of discovery—anything from who's been voted off the island to whether that speedometer in your family's attic really came from the *Hindenburg*. If the left-hand column of your chart has "moments of discovery" in it, in the right-hand column write down the

moment or moments of discovery in your article. Continue filling out the chart with information from your article. You might find that not every article contains every element you identified. That's okay. When you've completed your chart (including adding additional elements you may have thought of as you read and analyzed your article), look at how many or how few of the elements your story has. How good a show do you think it will make?

One way to answer that question is to consider your chart in light of whom you would like to be the audience for your show. Do you see it attracting a mass audience, like *American Idol*? Or a smaller one, like *History Detectives*? If your show has a very specific audience, that's okay. You'll just need to make sure you'll make it to please those people, and that you'll be showing it in places where your audience is likely to see it.

With your analysis in hand—which elements of reality TV your article has and what audience you'll be targeting—you can decide whether you've got the makings of a successful program. If you don't think you've got enough to make a really good show, you might split up your group and have members join the other groups. But we don't think that will be necessary. We think all the stories will make good reality TV.

"Pitching" Your Show

Probably a lot of people around the world have ideas they think would make good reality TV, just like people have ideas for books, movies—and magazine articles. But they don't all get to make their shows or pursue their other ideas. To get anything made you need to "pitch" it. "Pitch" is shorthand for "sales pitch." You have to "sell" your idea.

Think about whom you need to convince and how you can convince them that your show will benefit them in some way. Make sure you include the following two recipients for your sales pitch: First, you need to convince a TV channel that there's an audience for your show. Who will be your audience? Which channel caters best to that audience?

The other pitch recipient is the one with the money—a financial backer. Someone





segments of your show in order, listing them in the left-hand column of another two-column chart. In the right-hand column of the new chart, identify visual images you can use during each segment of your show. Some of those visual images might come from the photos in the magazine. (The photos that accompany “Sailing Through Time” are particularly action-oriented.) Other images you might imagine. For others you might find models online.

Extra Credit! If you have the technology and the time, actually make one or more segments of your show. This will take some imagination, but small samples like this are



what impress your funders and the TV executives. Share them with your class, and vote on which show gets made first.

Reflecting on What You’ve Done

One thing that effective learners do is reflect on what they’ve done. With your group, discuss what you’ve learned from this project. Some of the knowledge you’ve gained no doubt came from the content of the article you used. Discuss that. You’ve also learned about some more general things: what works in different media, for example. List these as well. When you’re done, write an email to me at julie.w1@comcast.net telling me about what you’ve learned, what you liked best about this project, and what you wish I’d done differently. I’ll pass it on to the editors of *Saudi Aramco World*. That will help us reflect, because we’re learning, too. Your feedback can help us improve our next Classroom Guide.

has to pay for you to build the *Jewel of Muscat*, perform mtDNA analysis on ancient bones or travel to places where you’ll find early examples of pointed arches. Sometimes those funders are companies that want “product placement” in shows. That’s why you might see on a show or in a movie a brown truck from a specific delivery company or a red can from a particular soda company. Are there any such companies that might want their product to be visible on your show? Be creative: Think, for example, about airlines (for your global travel) and pharmaceutical companies (who might have the tools for doing DNA analysis). Another possible funding source is an organization that funds educational shows. The National Geographic Society, for example, might provide money for research that would make for good programming.

Constructing the Narrative and Thinking Visually

Now comes the really fun part. Before they could write the articles you read, *Saudi Aramco World’s* writers had to sit down with a lot of information and figure out how to make it into an interesting story. That’s what you’re going to do, with one big difference: What makes an interesting magazine article might be different from what makes a compelling reality show. This is when you need to think about the medium and genre you’ll be working with. Rather than a magazine (medium) with a non-fiction article (genre),

you’ll be planning a television (medium) reality show (genre).

You already began this process when you identified the characteristics of a good reality show. Now turn your attention to sequence: in what order will you put these elements in creating your show? How will you construct a narrative—put together a story to tell—that will keep viewers watching? You might find it helpful at this point to do a little research: watch one or more episodes of a reality show! But don’t just watch for fun. Watch with paper and pen in hand. (Not only might this convince your parents that you’re actually working, but it will help ensure you *are* actually working!) Notice as you watch the show that it is divided into segments. They might be recognizable because of commercial breaks, or because of scene changes, topic changes or point-of-view changes. As you watch, list the segments you see. (You can watch with one or more of your group-mates if you think it will help you with this part.) What you’re really doing here is called a “reverse outline.” You’re seeing how a show is organized, writing down that organization and using it to help you outline your own show.

With the members of your group, create an outline for your reality show. Use the following materials: the outline of the show you watched, the article from *Saudi Aramco World* and the two-column chart that shows the elements of reality TV and how they correspond to your content. Outline the



The Horse: *Ancient Arabia to the Modern World* traces the animal's story across thousands of years of human history, displaying exhibits that range from newly excavated Saudi rock carvings—which may move the date and place of first domestication thousands of miles south and thousands of years back—to a miniature Persian gold chariot with four horses, made around 2500 years ago, to Victorian engravings of famous racehorses. Because a skilled archer on horseback was the most dangerous weapon in any war before the development of artillery, the exhibition also includes two complete sets of Islamic and western horse armor. The wild horse was domesticated at least 5000 years ago, initially for meat and later for transport, transforming how far a man could travel and how much he could carry. The exhibition traces the evolution of the elegant, swift Arabian horses, whose distinctive arched necks and tails can be seen in Assyrian sculptures, Egyptian wall paintings and ancient Greek vases. British Museum, London, May 24 through September 30.

Current May

Mother India: *Transactions in the Construction of Pain* is a five-screen multimedia work by influential Indian artist Nalini Malani, whose works focus on issues of identity, gender, migration and political violence. "Mother India" features images from the time of Partition: women, flags, Gandhi, refugees carrying their possessions on their heads and destroyed landscapes. Art Gallery Road, Sydney, Australia, through May 20.

"The Beloved." Trailblazing Palestinian theater company ShiberHur presents the story of Abraham and Isaac, told in both the Bible and the Qur'an. "When you held the knife to my throat ... I opened my mouth to beg for mercy.... I was no longer a human being...." When Abraham returns home from his journey with his son, his wife is troubled by the boy's state of mind. What took place on the mountain that day is the beginning of a lifetime of suffering for his son and the dawn of a new age for millions. Bush Theatre, London, May 21 through June 9.

Contemporary Arab and Lebanese Cinema highlights some of the most critically acclaimed films to come out of the Arab world, including "Stray Bullet" and "Where Do We Go Now?" Produced by a generation of filmmakers whose memories of Lebanon's civil war remain vivid, these recent examples follow one of the Arab world's most emblematic nations from a state of post-traumatic crisis through to post-revolutionary catharsis. Cornerhouse, Manchester [uk], through May 22.

Cai Guo-Qiang: *Saraab* includes more than 50 works by one of the most influential international contemporary artists in his first solo exhibition in the Middle East. *Saraab* ("mirage") illuminates the long-standing but little-known relationship between China and the Arab world dating back to the ancient Maritime Silk Roads. Featuring the artist's characteristic use of symbols and stories about local history and transnational movements, the exhibition explores the historic and contemporary iconography of the Arabian Gulf and its seafaring culture, as well as the Islamic history of Quanzhou. Works on view also address the ambiguity of Qatar and China's relationship, as well as Cai's own creative development. Quanzhou was a significant maritime port on the ancient Silk Roads and a trade hub for silk, porcelain, tea and spices. The city also hosted some of the earliest Muslim missionaries, now buried in the city's Holy Mausoleum. Mathaf: Arab Museum of Modern Art, Doha, Qatar, through May 26.

Through the Looking Glass. Emirati artist Lamya Gargash presents a new body of work that addresses societal notions of beauty and intimate perceptions of self and identity through a portrait series, raising challenging questions about

self-reflection and criticism in relation to media representation of body image and beauty standards. The photographs are diptychs, with one panel depicting the subject as seen by the world and the opposing panel depicting the same subject as seen in his or her mind's eye. The Third Line, Dubai, through May 30.

World History Institute for Teachers: *Asia as the Crossroads of World History, 600-1800* is intended for high-school teachers who are new to teaching world history or who have been teaching world history for some time and are looking for ways to better incorporate Asia into their world history courses. Keynote speakers: Pamela Crossley, Dartmouth College, and Xinru Liu, College of New Jersey. Late registration through May 31. Gettysburg [Pennsylvania] College, July 8-13, 2012.

Current June

Conscious and Unconscious presents some 30 works from all periods of Louise Bourgeois's career, including sculptures, installations, drawings and fabric works from 1947 to 2009. The exhibition also complements and contextualizes the installation of Bourgeois's monumental 1999 sculpture *Mamam*, unveiled last December at the Qatar National Convention Center in Doha. The late American artist, one of the most influential and groundbreaking artists of the 20th century, conceived the nine-meter bronze spider as an ode to her mother. Katara Art Center, Doha, Qatar, through June 1.

Painting the Modern in India features seven renowned painters who came of age during the height of the movement to free India from British rule. To move from the margins of an art world shaped by the colonial establishment, they organized groundbreaking associations and pioneered new approaches to painting, repositioning their own art practices internationally and in relation

to the 5000-year history of art in India. These artists created hybrid styles that are an essential component of the broad sweep of art in the 20th century. Peabody Essex Museum, Salem, Massachusetts, through June 1.

Gifts of the Sultan: *The Arts of Giving at the Islamic Courts* is a pan-Islamic exhibition spanning the eighth through 19th centuries and including more than 240 works of art from three continents: carpets, costumes and textiles, jewelry and other objects of precious metals, miniature paintings and other arts of the book, mosque furnishings and arms and armor. It introduces viewers to Islamic art and culture with objects of undisputed quality and appeal, viewed through the universal lens of gift giving—a practice that proliferated at the great Islamic courts not only for diplomatic and political purposes but also as expressions of piety, often associated with the construction or enhancement of religious monuments. Museum of Islamic Art, Doha, Qatar, through June 2.

Nomads and Networks: *The Ancient Art and Culture of Kazakhstan* provides a comprehensive overview of the nomadic culture of the peoples of eastern Kazakhstan's Altai and Tianshan regions from roughly the eighth to the first century BCE. With more than 250 objects on loan from Kazakhstan's four national museums, the exhibition provides a compelling portrait that challenges the traditional view of these nomadic societies as less developed than sedentary ones. Artifacts on view in the exhibition range from bronze openwork offering stands, superbly decorated with animal and human figures; to petroglyphs that marked important places in the landscape; to dazzling gold adornments that signaled the social status of those who wore them. Institute for the Study of the Ancient World, NYU, New York, through June 3;

thereafter at the Sackler Gallery, **Washington, D.C.**

After Yesterday: *From the Photography Collection of Istanbul Modern* presents a selection from the collection begun the day the museum was founded. Bringing together modern and contemporary examples from Turkish photography, the show displays 179 prints that outline the technical and conceptual development of Turkish photography from the Ottoman era to our day. Among the 153 participating artists are Cengiz Akduman, Burcu Aksoy, Aziz Albek, Ersin Alok, Orhan Cem Çetin and Ahmet Elhan. A further 66 works by 213 artists are on display in digital format. **Istanbul Modern**, through June 3.

To Live Forever: *Egyptian Treasures From the Brooklyn Museum* uses some 100 pieces of jewelry, statues, coffins and vessels dating from 3600 BCE to 400 CE to illustrate the range of strategies and preparations that the ancient Egyptians developed to defeat death and to achieve success in the afterlife. The exhibition explores the belief that death was an enemy that could be vanquished, a primary cultural tenet of ancient Egyptian civilization, and explains the process of mummification, the economics and rituals of memorials, the contents of the tomb, the funeral accessories—differentiated by the class of the deceased—and the idealized afterlife. Joslyn Art Museum, **Omaha, Nebraska**, through June 3.

Heroes: A New Look at African Art challenges conventional perceptions of African art. Bringing together more than 100 masterpieces, it considers eight landmark sculptural traditions from West and Central Africa created between the 12th and early 20th centuries in terms of the individual persons who lie at the origins of the representations. Using materials ranging from humble clay, ubiquitous wood and precious ivory to costly metal alloys, sculptors captured evocative, idealized and enduring likenesses of their individual patrons. Analysis of each of these works considers the historical circumstances and cultural values that inform them; the sculptures are among the only concrete surviving links to generations of leaders who shaped Africa's past. Catalog. Museum Rietberg, **Zurich**, through June 3.

Blue Ornament is a two-person exhibition of the works of New York-based Kamrooz Aram and Seher Shah. The pieces explore the conflicted relationship between the decorative tradition of ornament and western modernism, revealing the evolution of both styles throughout history. Green Art Gallery, **Dubai**, through June 5.

Subversion shows new and recent contemporary art that explores and rethinks modern Arab identity. The exhibition features work including installation, video, photography and sculpture produced by 11 emerging and established artists who use autobiographical narratives amalgamated with fiction, popular culture and subversive parody to express the dichotomies they face as they perform multiple roles in society—a society frequently represented to the outside world in a contorted manner. Cornerhouse, **Manchester [UK]**, through June 5.

Iraq: How, Where, for Whom? is a collaboration between Iraqi artist Hanaa' Malallah and the British duo Kennard-Phillipps, who share a critical and reflective view of the invasion and occupation of Iraq. The exhibition features large-scale collages, installations, photomontage pieces and sculptures. Malallah's work uses burnt canvas, cloths, wire objects and paint to create violently abstract yet sensuous pieces. Kennard-Phillipps's work manipulates and subverts press material on the Iraq War and the subsequent occupation. Mosaic Room, **London**, through June 8.

Reflections From Heaven, Meditations on Earth: *Modern Calligraphic Art From the Arab World* displays 72 artworks from the Jordan National Museum's permanent collection, representing 57 artists from different Arab countries and highlighting various calligraphic styles, trends and subject matter. Participating artists include Omar Bilbeisi, Hassan Massoudy, Nja Mahdoui, Hussein Madi and Rachid Koraichi. Mercati di Traiano, **Rome**, through June 10.

The Art of the Anatolian Kilim: *Highlights From the McCoy Jones Collection* showcases two dozen Turkish flatweaves dating from the 15th to the 19th century and exhibiting a variety of design types and regional styles, as well as superb examples of artistic and technical skill. De Young Museum, **San Francisco**, through June 10.

Istanbul Modern: Rotterdam presents a selection of works by 14 contemporary Turkish artists who worked during various periods from the 1970's to the present. In "New Citizen 11111," inci Eviner presents a mural contrasting traditional European wallpaper with Ottoman tiles, which incorporates three videos about traditional sign language. Sarkis contributes a 10-part stained-glass series that features figures from "The Lord of the Rings." Hale Tenger's video "Beirut" is a loop showing the front of a hotel. Museum Boijmans-van Beuningen, **Rotterdam**, through June 10.

I Have Two Loves exhibits works from the contemporary art collections of the National Center for the History of Immigration. The participating artists, many of them in transit between their home countries and the cultural capitals where they wish to work, deal with the question of mobility as both a geographical fact and a way of living, creating and recreating themselves. Their works reflect their dual identities and testify to the tensions of a rootless life. Cité nationale de l'histoire de l'immigration, **Paris**, through June 24.

The Throne. Syrian artist Othman Moussa's still life paintings draw inspiration from 17th-century Dutch realism and include subdued satire and political commentary. Ayyam Gallery, **Dubai**, through June 24.

Murakami: Ego displays some of renowned Japanese artist Takashi Murakami's most celebrated series, including *Kaikai Kiki Lots of Faces* and *Pom Me*, revealed in their entirety for the first time. Murakami has also conceived a 100-meter-long painting that wraps around the exhibition space, as well as a circus tent housing his digital

animation and films. Al Riwaq Art Space, **Doha, Qatar**, through June 24.

Treasures of the Aga Khan Museum: Architecture in Islamic Arts focuses on the importance of architecture in the artistic traditions of the Islamic world. Among the most notable of the approximately 100 artifacts on exhibit are a 16th-century folio from the *Shahnama* of Shah Tahmasp; *muqarnas* and ornamented wood pieces from 15th-century Spain; glazed turquoise earthenware elements from late 14th-century Central Asia; tiled arches from 15th-century Egypt; ornamental doors from ninth-century Iran; and 16th-century Iznik tiles from Turkey. Islamic Arts Museum **Malaysia, Kuala Lumpur**, through June 29.

Current July

Love and Devotion: *From Persia and Beyond* features more than 60 rare Persian, Mughal Indian and Ottoman Turkish illustrated manuscripts from the 13th to the 18th century, as well as related editions of European literature, travel books and maps. These works come from one of the richest periods in the history of the book and shed light on the artistic and literary culture of Persia, showcasing classic Persian tales and revealing the extent to which Persian language and culture influenced neighboring empires, as well as parallels in the work of European writers dating back to Shakespeare, Chaucer and Dante. State Library of Victoria, **Melbourne, Australia**, through July 1; thereafter Bodleian Libraries, **Oxford, England**.

Byzantium and Islam: Age of Transition. The Eastern Mediterranean, from Syria across North Africa, comprised the wealthy southern provinces of the Byzantine Empire at the start of the seventh century. By that century's end, the region was central to the emerging Islamic world. This exhibition displays the complex character of the region and its exceptional art and culture during the era of transition. Images of authority, religion and especially commerce show the dialogue between established Byzantine and evolving Islamic styles and culture, and the exhibition also addresses iconoclasm as it emerged during that period among the Christian, Jewish and Islamic communities of the region. Catalog. Metropolitan Museum, **New York**, through July 8.

Patriots & Peacemakers: *Arab Americans in Service to Our Country* tells true stories of heroism and self-sacrifice that affirm the important role Arab-Americans have played in the United States throughout its history, contributing greatly to society and fighting and dying in every US war since the Revolution. The exhibition highlights service in the armed forces, the diplomatic service and the Peace Corps. Personal narratives tell of Arab-American men and women of different national and religious backgrounds. Arab American National Museum, **Dearborn, Michigan**, through July 12.

Art Exhibition: Readymade Representations reveals recent works by Palestinian artist Khalil Rabah, photo-realistic paintings based on photographs of various exhibitions of Palestinian art, which themselves took place in different locations around the world since 1954. This

ongoing project retraces the presence of figures, protagonists, platforms and documentation in the art world, and seeks to create a subjective re-mapping of exhibition-making practices. Sfeir-Semler Gallery, **Hamburg, Germany**, through July 13.

Buried Finds: Textile Collectors in Egypt. From about 1880 to 1930, large quantities of textiles from the late Roman, Byzantine and early Islamic periods were excavated, mainly from burials in the cemeteries of the Egyptian cities of Panopolis (Akhmim) and Antinoë (Sheikh Ibada) and of the Fayum. Excavations, often unsystematic, in search of textiles and grave goods were overseen by professional and amateur archeologists, but also by dealers and collectors. The result is thousands of fragments and relatively few complete textiles in museum collections, and scanty evidence regarding find sites and burial context. Archeologists, dealers and collectors frequently organized textiles into albums composed of paper boards onto which fragments were sewn. Two examples are among the exhibits on view in this exhibition. Metropolitan Museum of Art, **New York**, through July 15.

The Body Revealed explores the representation of the body and the nude in Arab visual arts, a theme so little discussed or exhibited that one might suspect that there is no material to exhibit. In fact, this little-known genre of Arab painting offers many surprises, a rich iconography and much to discuss. A large selection of works in a variety of media provides opportunities to examine the theme. Institut du Monde Arabe, **Paris**, through July 15.

Order and Disorder: Alighiero Boetti by Afghan Women displays 25 pieces designed by the Italian artist along with documentary photographs of the women who embroidered them, as well as with examples of the traditional Afghan textiles that inspired the artist in his use of embroidery as a medium. Fowler Museum at UCLA, **Los Angeles**, through July 29.

Current August

The Dawn of Egyptian Art brings together some 175 objects gathered from the Metropolitan and 12 other museums to illustrate the origins and early development of ancient Egyptian art. During the Predynastic and Early Dynastic Periods (ca. 4000–2650 BCE), people living in the Nile Valley began recording their beliefs in paintings, sculptures and reliefs made for their shrines and tombs. These works of art capture the evolving world-view of these early Egyptians. Images of people, animals and landscapes, some of which give rise to hieroglyphs, include forms and iconography that remained in use throughout the art of Pharaonic Egypt. Catalog. Metropolitan Museum of Art, **New York**, through August 5.

Current September

Picturing the Past: Imaging and Imagining the Ancient Middle East. The West's perception of the ancient Middle East has been formed by countless engravings, paintings, architectural reconstructions, facsimiles, models, photographs and computer-aided reconstructions of monuments and sites. This collection of 40 examples of art

depicting ancient sites examines how preconceptions, the perceived audience and artistic conventions have informed us about the ancient Middle East and how some of the more imaginative reconstructions have obscured our understanding of the past. Catalog. Oriental Institute, University of Chicago, through September 2.

Contemporary Iranian Art From the Permanent Collection presents seven works by six Iranian artists from three generations. Of the six—Monir Shahrudiy Farmanfarman, Parviz Tanavoli, Y. Z. Kami, Shirin Neshat, Afroz Amighi and Ali Banisadr—four live and work in the United States, while two continue to work in Iran. Although the works demonstrate the diversity of concepts, styles, techniques and modes of expression seen in Iranian contemporary art, each work reflects an intrinsic connection with Iran and addresses issues of identity and gender, political and social concerns and nostalgia for and pride in a rich artistic and cultural heritage. Metropolitan Museum of Art, New York, through September 3.

Genghis Khan: *The Exhibition* tells the story of the Mongol warlord who conquered half the known world. Under his rule, the empire grew to be the size of Africa—four times the size of the Roman Empire at its largest. But Genghis is also revered as an innovative leader and statesman who brought unity, stability and religious tolerance to most of Asia and parts of Europe. Highlights of the exhibition include jewelry, ornaments and musical instruments, weapons such as battle axes, scimitars, lances and long-and crossbows; and such other military essentials as steel stirrups and silk underwear. Field Museum, Chicago, through September 3.

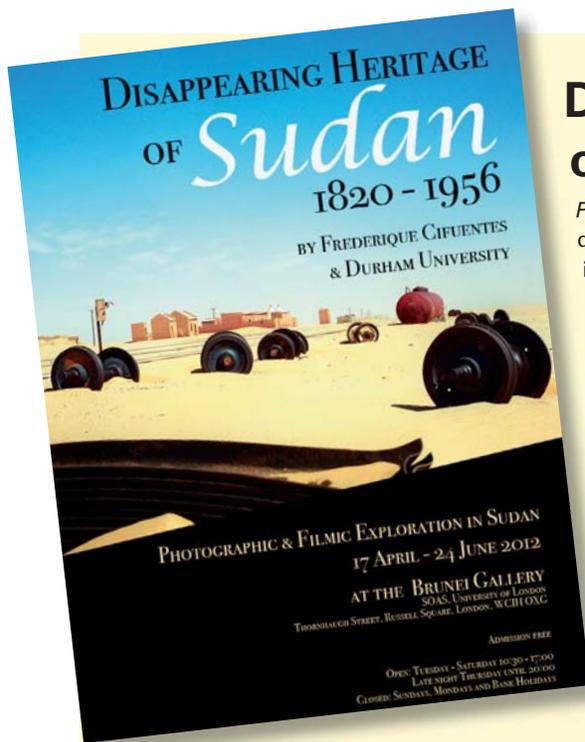
Gems of Rajput Painting features the museum's superb collection of paintings made for the princes of Rajasthan and the Punjab hills (known as "Rajputs"). The kingdoms of these art-loving princes shared a common elite culture, though, by the early 1700's, each court had developed its own distinct painting style. The exhibition represents four of Rajput painting's central themes: heroic narratives, women and romance, Krishna and Hindu devotion, and courtly life. Museum of Fine Art, Boston, through September 3.

Beauty and Belief: *Crossing Bridges With the Arts of Islamic Culture* aims to bridge differences and inspire

SAUDI ARAMCO WORLD
(ISSN 1530-5821)
is published bimonthly by
Aramco Services Company
9009 West Loop South,
Houston, Texas 77096-1799, USA

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Services Company. Volume 63,
Number 3. Periodicals postage
paid at Houston, Texas and
at additional mailing offices.

POSTMASTER:
Send address changes to
Saudi Aramco World
Box 2106
Houston, Texas 77252-2106



Disappearing Heritage of Sudan, 1820–1956:

Photographic and Filmic Exploration in Sudan documents the remnants of the colonial experience in Sudan from the Ottoman, Egyptian and British periods. This photographic and video project by Frederique Cifuentes explores the mechanics of empire, highlighting colonial architecture, design and construction—official buildings, private residences, cinema houses, railways, irrigation canals and bridges—and the impact they had on Sudanese society before and after independence in 1956. It also helps us understand the ways in which people appropriated and used the buildings after the end of the colonial period. Brunel Gallery, SOAS, London, through June; Oriental Museum, Durham [uk] University, January through March 2013; University of Khartoum, Sudan, September through December 2013.

insight through beauty, and address the question, "What makes Islamic art Islamic?" Tunisia-born project director Sabiha Al Khemir has assembled over 250 works from 40 lenders in the us and nine countries in Europe and the Middle East, including unique manuscripts from the Royal Library in Morocco. The exhibition represents a journey through Islamic culture from the seventh century onward, combining historical and geographic background with successive sections of calligraphy, figurative imagery and pattern, but it makes a point of touching on the present day, also including works by contemporary artists. Brigham Young University Museum of Art, Provo, Utah, through September 29; Indianapolis Museum of Art, November 2 through January 13; Newark [NJ] Museum, February 13, 2013 through May 19, 2013; Portland [OR] Art Museum, June 15, 2013 through September 8, 2013.

Fifty Years of Urban Walls: *A Burhan Doğançay Retrospective* represents Doğançay's last 50 years of work. Since the early 1960's, the renowned Turkish artist has examined the social, cultural and political transformation of modern and contemporary urban culture through the use of walls. The exhibition presents 126 works spanning 14 distinct series and periods of Doğançay's life. Istanbul Modern, Istanbul, May 23 through September 23.

Pergamon: *Panorama of the Ancient Metropolis* displays a wide variety of sculptures, mosaics, coins, ceramics and metal devices—along with a monumental 360° panorama—to present a vivid picture of life in the glittering ancient city, home of the famous Great Altar, with its depiction of the gods' battle against the giants. Most of the 450 exhibits, presented in their original architectural and functional contexts, have never been displayed before. Paintings, historical photographs and archival documents provide

insight into the history of the discovery and research of the site. Pergamonmuseum, Berlin, through September 30.

Object Atlas: *Fieldwork in the Museum* presents objects from the museum's ethnographic collections side by side with new paintings, films and three-dimensional installations created by seven international artists who undertook "fieldwork" in the museum. One artist's installation is based on floral elements from Indonesia together with hats, headrests and belts from Africa; another artist presents paintings related to mythical prehistoric stones from Papua–New Guinea; a third based his work on historical inventory cards from the museum. Weltkulturen Museum, Frankfurt, through September 16.

Coming May

Cleopatra: *The Search for the Last Queen of Egypt* features nearly 150 artifacts from the time of Cleopatra VII, taking visitors inside the modern-day search for the elusive queen, a search that reached the desert sands of Egypt to the depths of the Bay of Aboukir near Alexandria. The exhibition includes statuary, jewelry, everyday artifacts, coins and religious tokens from the time around Cleopatra's rule. California Science Center, Los Angeles, May 23 through December.

Tutankhamun: *The Golden King and the Great Pharaohs* features more than 100 artworks, most of which have never been shown in the United States before this tour. These spectacular treasures—more than half of which come from the tomb of King Tutankhamun—include the golden sandals found on the boy king's mummy; a gold coffinette that held his stomach; golden statues of the gods; and King Tut's rings, ear ornaments and gold collar. Also showcased are objects associated with the most important rulers of the 30 dynasties that reigned in Egypt over a 2000-year span. The exhibition explores the splendor of the pharaohs,

their function in both the earthly and divine worlds, and what "kingship" meant to the Egyptian people. Pacific Science Center, Seattle, May 24 through January 6.

Expressions of Diversity: *An Introduction to Muslim Cultures* is a two-week summer program intended to deepen understanding of the diversity and traditions of Muslim societies. Designed for those without a formal background in Muslim history or Islamic studies, the program will cover a wide range of topics, including pluralism, law, modernity and gender. It is hosted by Simon Fraser University at its Vancouver (BC, Canada) campus, in partnership with the Aga Khan University (London). Program dates are July 9 through July 20; registration deadline is May 30. ① www.ccsmsc.sfu.ca/summer/2012.

Coming June

Shadow of the Sphinx: *Ancient Egypt and Its Influence* explores the unparalleled impact on the modern western imagination of ancient Egyptian culture: its writing, its art, its religion and its funeral practices. The exhibition presents Egyptian artifacts—jewelry, coffins, portrait masks—together with such European and American objects as paintings, movie posters, porcelain, jewelry and furnishings, all inspired by real or imagined aspects of ancient Egypt. Munson Williams Proctor Arts Institute, Utica, New York, June 17 through November 25.

Words articulates graphic designer, photographer and artist Rajie Cook's deeply felt concern for human rights in general and the Palestinian question in particular, using graphics, film and sculptural assemblage. Jerusalem Fund Gallery, Washington, D.C., June 29 through July 20.

Paradise Imagined: *The Garden in the Islamic and Christian World* explores the art of gardens and the cross-fertilization of garden imagery between East and West. Gardens have functioned as

spaces of invention, imagination and mythmaking, as well as places of repose and recreation, for different cultures across time. Using the pages of some 22 illustrated herbals, poetry and epic and sacred texts from the museum's collections, the exhibition focuses on the transmission, exchange and assimilation of garden imagery and metaphors between the Islamic and Christian worlds in the late medieval and early modern eras. The show addresses the image of the garden as an expression of love, power, philosophy, spirituality and knowledge, evoked through word and image. Walters Art Museum, **Baltimore**, June 30 through September 23.

Coming **July**

"The Light in Her Eyes" is a documentary film about a Qur'an school for women and girls in Damascus, Syria. Houda al-Habash founded her school 30 years ago, and every summer, her female students immerse themselves in a rigorous study of Islam. A surprising cultural shift begins: Women are claiming space within the mosque. "The Light in Her Eyes" offers an extraordinary portrait of a leader who challenges the women of her community to live according to Islam, without giving up their dreams. US national broadcast on "POV," PBS, July 19.

The Colonial Eye: Early Portrait Photography in India presents an extensive and important collection that includes not only the work of such well-known photographers from the second half of the 19th century as Samuel Bourne, Shepherd & Robertson, A. T. W. Penn and John Burke, but also many lesser-known or anonymous practitioners of ethnographic photography, genre portraits of artisans or portraits of Muslim nobility, maharajas and clan heads, some of whom chose to be portrayed in their own palaces. Museum of Photography, **Berlin**, July 20 through October 21.

Gods on Swings and Dancers in Trance: Bronze Art from Tribal India displays extraordinarily powerful stylized bronzes from Bastar, a region in central India that is home to a majority of tribal people. The artworks show mighty gods, processions and possessed dancers that are the products of a living, complex but little-known culture. Museum Rietberg, **Zurich**, July 20 through November 4.

Coming **September**

The Sultan's Garden: The Blossoming of Ottoman Art chronicles how stylized tulips, carnations, hyacinths, honeysuckle, roses and rosebuds came to embellish nearly all media produced by the Ottoman court beginning in the mid-16th century. These instantly recognizable elements became the brand of an empire that spanned seven centuries and, at its height, three continents, and was synonymous with its power. Incredibly, the development of this design identity can be attributed to a single artist, Kara Memi, working in the royal arts workshop of Istanbul. The exhibition unveils the story of this artist's influence and traces the continuing impact of Ottoman floral style through the textile arts—some of the most luxurious and technically complex productions of the Empire. Textile Museum, **Washington, D.C.**, September 21 through March 10.

Coming **October**

Roads of Arabia: Archaeology and History of the Kingdom of Saudi Arabia. The study of archeological remains only really began in Saudi Arabia in the 1970's, yet brought—and is still bringing—a wealth of unsuspected treasures to light: temples, palaces adorned with frescoes, monumental sculpture, silver dishes and precious jewelry left in tombs. The exhibition, organized as a series of points along trade and pilgrimage routes, focuses on the region's rich history as a major center of commercial and cultural exchange, provides both chronological and geographical information about the discoveries made during recent excavations, and emphasizes the important role played by this region as a trading center during the past 6000 years. Elegant alabaster bowls and fragile glassware, heavy gold earrings and Hellenistic bronze statues testify to a lively mercantile and cultural interchange among distant civilizations. More than 300 works—sculptures, ceramics, jewelry, frescoes—are on display, dating from antiquity to the beginning of the modern period, the majority never before exhibited. Sackler Gallery, **Washington, D.C.**, October 20 through February 20.

Diadem and Dagger: Jewish Artisans of Yemen introduces Yemeni Jewish silverwork dating from the 17th through the 19th centuries, decorated with elaborate filigree and granulation and inscribed in Hebrew or Arabic with references, in some cases, to Muslim rulers. Some 25 objects are on display. Walters Art Museum, **Baltimore**, October 27 through January 13.

The British in Palestine: 1917–1948: Palestine under the British Mandate. Brunei Gallery, SOAS, **London**.

Coming **November and later**

Amarna 2012: 100 Years of Nefertiti, an extensive special exhibition on the Amarna period, allows Nefertiti's time to be understood within its cultural-historical context. All aspects of this fascinating period are illuminated and explained—not only the period's theology and art, but also everyday life in the city, ancient Akhetaton. Founded by the monotheist Pharaoh Akhenaton (Amenhotep IV) to establish a new capital with places of worship for his own 'religion of light,' the city was built within three years and populated in the year 1343 BCE. At the beginning of the 20th century, extremely successful excavations took place there under the direction of Ludwig Borchardt, and the finds were shared between Cairo and Berlin. The exhibition illuminates the context of the discovery of the bust of Nefertiti in the workshop of the Egyptian sculptor Thutmose, along with numerous related objects, including even the pigments and tools used by the sculptors. Along with the exhibition's main focus on archeology, it also critically examines the history of the depiction of the bust of Nefertiti both as an archeological object and as a widely marketed ideal of beauty. Visitors can experience the Amarna period as a social, cultural-historical and religious phenomenon. Neues Museum, **Berlin**, December 7 through April 13.

PERMANENT

The Bodleian Libraries have digitized and made available for the first time their exceptional collection of Cairo Genizah fragments at <http://genizah.bodleian.ox.ac.uk>. The Cairo Genizah is an accumulation of almost 280,000 medieval manuscript fragments, mostly written in Hebrew and

Judeo-Arabic. They were discovered in the late 19th century in an annex of a synagogue in Fustat (Old Cairo), Egypt. Documents accumulated there from the ninth to the 14th centuries and remained there until their value for scholarship was discovered. The Bodleian's Genizah holdings are exceptional since it was the first major library outside the Middle East to acquire fragments from the Cairo Genizah at the end of the 19th century.

Traders: The East India Company and Asia explores the history and continuing relevance of British-Asian trade through the lens of the East India Company, exploring the Company's influence and power and examining the commodities it traded, the people who shaped its 250-year history and the conflicts and rebellions that led to its undoing. Though their forerunner, the East India Company far exceeded modern-day multinationals in scope and power, minting its own currency, operating its own military and ruling over one-sixth of humanity at its height. The exhibition's five sections are "The Maritime World of Asia," "Spices," "Textiles," "Tea" (including the opium trade) and "The Company in Crisis." National Maritime Museum, **Greenwich [uk]**.

Information is correct at press time, but please reconfirm dates and times before traveling. Most institutions listed have further information available at their Web sites. Readers are welcome to submit information eight weeks in advance for possible inclusion in this listing. Some listings have been kindly provided to us by *Canvas*, the art and culture magazine for the Middle East and the Arab world.

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