Saudi Aramco World

May/June 2006

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# World

## COOKING IN HUNZA

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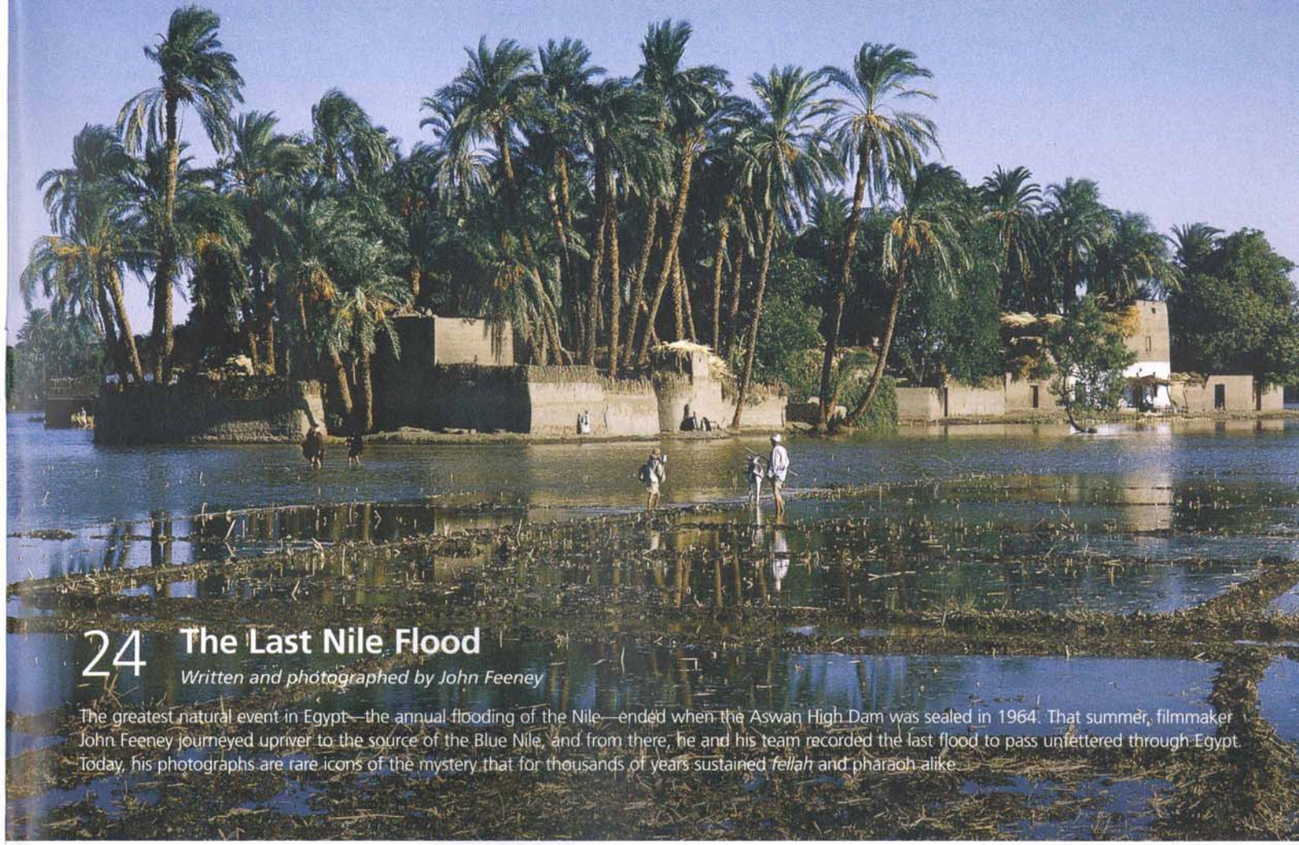







**Cover:**

One of few sweets in the Hunza Valley cuisine, Sultan Qoq is made by grinding, in one mortar, apricot kernels and walnuts, and in another, dried mulberries. These are then combined with a small amount of water to make a paste that can be shaped and allowed to dry. Substitute ingredients include almonds for the apricot kernels, and raisins (sultanas) for the mulberries. Photo by Matthieu Paley.

**Back Cover:**

As the Nile River flood rose across Egypt for the last time in 1964, villagers rushed to demolish the temporary earthen dams that had retained a little water from the previous year, welcoming the eager, life-giving flow that would irrigate and fertilize their fields. Photo by John Feeney.


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**President and Chief Executive Officer**
Mazen I. Snobar

**Director Public Affairs**
Deya A. Elyas

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**Editor**
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The Editor
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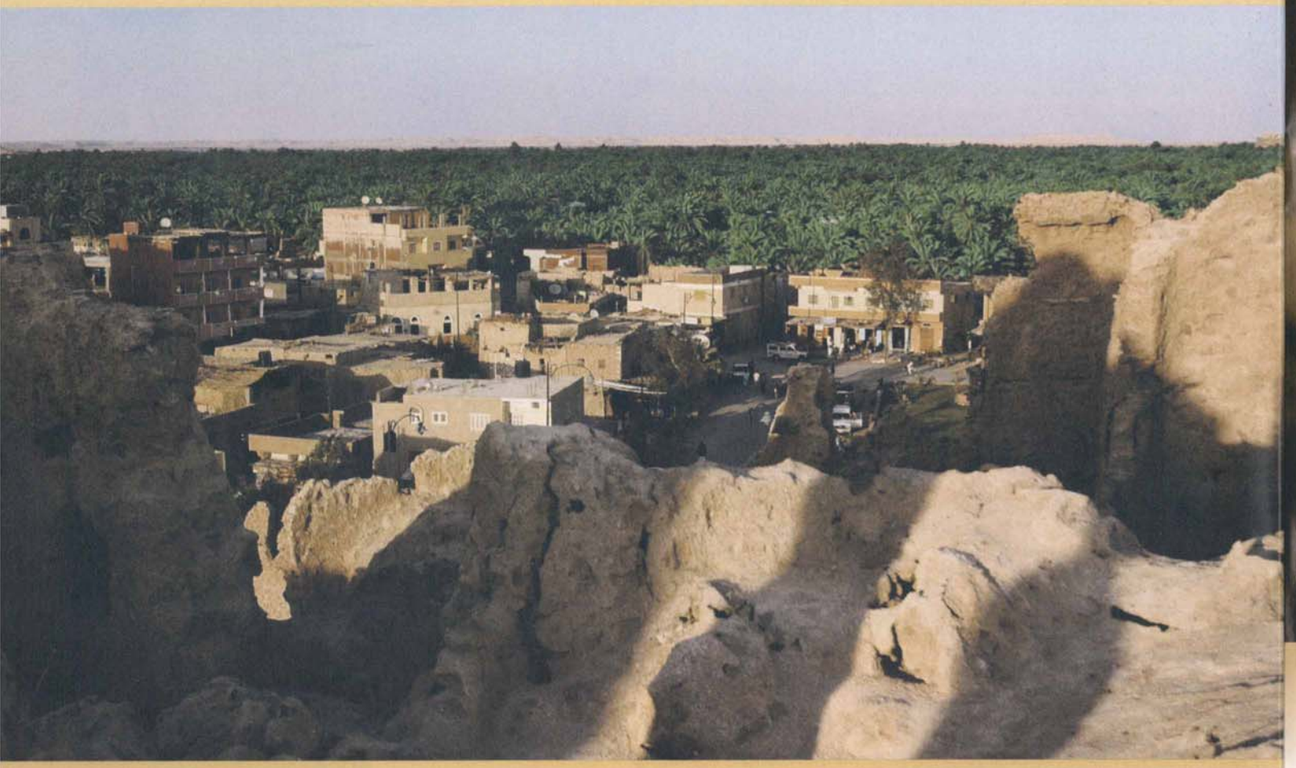
# An Oasis in the Balance

Written by Sylvia Smith  Photographed by Laura El-Tantawy



The light cast by the rising moon glinted and danced on the glassy surface of a vast salt lake as we drove back toward the oasis. Before sunset, we had seen luminous rocks, shell beds and miles of dunes all around, the start of the Great Sand Sea that runs east to the Nile and stretches endlessly west across North Africa toward the Atlantic. Abdallah Baghi had stopped to let some air out of the tires, the better to ride over the soft sand. He explained that he was navigating in part by eye, looking out the Jeep's side window to spot the different types of sand and avoid getting stuck.

Darkness brought with it the profound sense of isolation in the desert that Paul Bowles called "the baptism of solitude." Then suddenly Baghi's cell phone rang. The 21st century reasserted itself, and I returned to being a mere passenger in a Jeep.

Speaking in his native Siwi—a Berber dialect—Baghi continued driving in the dark with the assurance of a man who knows the landscape by heart. Then he held the phone away from his ear so I could hear a loud bellowing. "Donkey!" he said, smiling widely.

The braying of donkeys is one of the signature sounds of the swath of green that is the oasis of Siwa. "You can't get away from donkeys here," he laughed. "They are part of our lives." As if on cue, a small boy went past us in the other direction, confidently driving one of the donkey carts that in Siwa are still more common than motorized transport.

**Home to some 300,000 date palms and one-tenth as many people, Siwa lies 300 kilometers (185 mi) from Mersa Matruh, the nearest town. A road first connected the two in the mid-1980's. Heavy rains "melted" the old town, foreground, in 1926.**

"See what I mean?" Baghi pointed out. "Boys learn to manage a donkey cart almost as soon as they can walk. It's part of what we learn from our fathers."

But it's not all that Siwan children learn: As head of Siwa's Education Department since 1999, Baghi administers the school curriculum under the auspices of the Egyptian government.

More importantly, he is a leader to whom people in the oasis voice their concerns about matters from tourism to land sales and from organic produce to cultural preservation—all issues that arise as Baghi helps to steer Siwa through the rapidly shifting sands of modernity.

Salamah, a farmer who comes to town once a week to sell his produce at market, tells me that the oasis, whose population now stands at about 30,000, runs on cooperative, close-knit connections among its people. His business is doing well, he says, but he is concerned about the impact of "outside influences" that have come since the 1980's, when an asphalt road was built that links Siwa to the city of Mersa Matruh on the Mediterranean coast.

"We now have lots of people coming here, buying land," he confides. "Some of them are Egyptian; some are foreigners. They say they want to build houses or hotels, or else use the land for agriculture. We want to share our oasis, but we don't want it spoiled. Already a couple of my neighbors have sold off some of their plots for small amounts of money. That's a short-term view. They can't see what this will mean if lots of us all do the same."

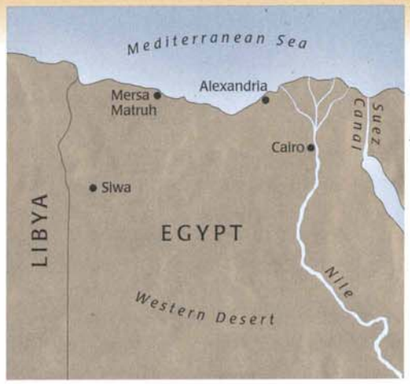
Baghi is well aware that part of Siwa's allure is that everything grown in the oasis is naturally organic. "No pesticides have ever been used here," he explains. "Business people from Cairo and Europe see the potential for growing organic produce. It's still easy to buy land cheaply. There are no official statistics about how much land has been sold off. But I worry that local people may lose out."

*In 1999, Baghi received one of six Race Against Poverty Awards from the UN. "It's hard to notice poverty here," he explains. "We help one another to get over difficulties."*

**As head of local education, Baghi deploys Siwi, Arabic and English with equal ease. "Among ourselves, we always speak Siwi. But to deal with the outside, we need Arabic," he says.** Below: **The captain of Siwa's championship soccer team receives a trophy and a handshake.**

LOWER: RICHARD DUEBEL

One of the oasis springs helps irrigate a date grove. Uncontrolled private well-digging has caused overfilling of the salt lakes (opposite, top) that lie on the edge of the oasis, threatening some date groves.




In 1989, Baghi helped organize the Siwa Heritage Committee to protect costumes, silver jewelry, basketry and other craftwork and antiques that were rapidly being bought up by tourists and collectors from Siwan families eager for cash to buy new consumer goods. The committee's museum, Siwa House, is now "part of a network of small museums all over Egypt. We're learning how to conserve our past, and that's important. Only now, it is the land itself that we're losing," Baghi concedes. "It's not happening in a way we can easily control: just individuals coming to buy without making a fuss."

*"No pesticides have ever been used here," says Baghi. With organic certification, "we would be paid almost twice as much" for the dates and vegetables Siwa exports.*

Baghi's profile in Siwa received a boost in 1999 when he was one of six people worldwide who received that year's United Nations Race Against Poverty Award, given annually to leaders in remote areas who help better their communities.

"It's hard to notice poverty here," he explains. "Siwans have their dignity. There are no beggars in the street, and we help one another to get over difficulties." Ali, a small, wiry man who works as a waiter, explains that Baghi's great-great-grandfather wrote Siwa's constitution. "He was a strong man who brought prosperity to many people in the oasis," he says.

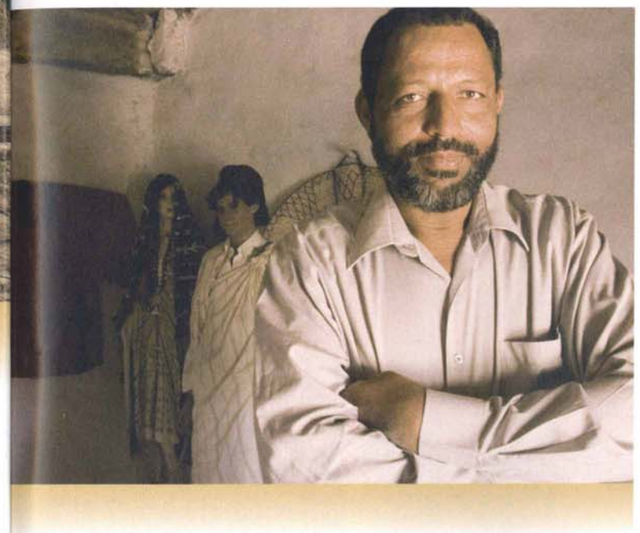
Having its own constitution underlines the historical independence of the oasis, one of the most remote in the vast Sahara region. "It doesn't mean we don't follow Egyptian law," Ali adds. "These are additional rules that govern our conduct toward one another. Siwa is a very close-knit place: No Siwans ever leave permanently. If they leave to study, they always come back."

Baghi's tall, well-built frame is almost as universally known in the oasis as his elderly, somewhat battered Jeep. People wave to him, and they come forward to greet him as he gets out of the car. "Among ourselves, we always speak Siwi. But to deal with the outside, we need Arabic. So the children in school study Arabic. Many older people don't know Arabic. But now we are part of the modern world," he says.

Another reason he is highly regarded is his degree in philosophy from Alexandria University and his polished, idiomatic command of English. Even though he does not hold the title of *shaykh*, nor sit on the town council (which reaches its decisions by majority vote), he is uniquely influential in connecting the oasis to the larger world.

"He is always well informed," remarks Salamah. "Most of us only hear rumors, but Abdallah gets to the heart of what's really going on." Salamah tells how, despite the hundreds of natural springs that have irrigated Siwan agriculture for centuries, some years ago farmers came to believe that individual water supplies could raise the productivity of their lemon, mulberry, almond, carob, peach and olive trees. The wells they dug gushed uncontrolled, and the excess water flowed to the lowest points in the oasis—the salt lakes that surround Siwa.

The Siwa Heritage Committee, which Baghi helped organize, runs the town's small museum, below. "We're learning how to conserve our past," he says. Right, from top: Salt lakes around the oasis; the old city of salt and mud, now popular with tourists; a frond of the date palms that sustain Siwa's economy.



"And so, as the level of the lakes rose, the salty water started to nibble at the edges of the date groves," Salamah goes on. Baghi interrupts to point to a couple of shut-off taps in neighboring gardens. "New drilling is now banned, and all small, individual springs have been capped. We've set up times for each garden to use the water from the main springs. We're waiting to see if that solves some of the problem."

The alarm about the lakes comes from their potential threat to the basis of the Siwan economy: the harvest from some 300,000 date palms. There is no overall figure for the value of the crop, but there are five date-packaging plants in the oasis employing hundreds of people.

"This is why getting organic certification is a priority for us," Baghi says, adding that Siwan farmers are already in contact with the main European certification agencies for both dates and Siwa's number-two crop, olives. "We would be paid almost twice as much for the same amounts of fruit. But farmers are still poor. They're easily persuaded to sell off parcels of land to foreigners, and we don't yet know what will happen in the long term," he says.

Farther down the road is a piece of land that will never be up for sale, nor will it be built upon. It's the Shali, the old walled town that a three-day rain in 1926 literally melted into haunting, Gaudi-esque ruins.

As Baghi strides along pointing to landmarks, a stooped, elderly man named Sulayman greets him. In his younger days, Sulayman was the *muezzin* who called worshipers to prayer five times a day. "You see the old adobe mosque over there," Baghi points out. "We are hoping that more of the new houses being built in the oasis will have a final coat of our traditional salt mud. That's one of the characteristics of our architecture." Sulayman nods in agreement. "Using concrete may be practical, but it doesn't look right here," he says.

Baghi's view is that adobe is the appropriate type of construction in Siwa, even though "it is pricey to build and maintain these traditional houses," he admits. "But by putting a final coat of mud on houses built of modern materials, we can keep costs down, and yet buildings look traditional. It's also a matter of passing on skills. We're already training youngsters in the mud technique."

According to Mounir Neamatallah, Egypt's leading environmentalist who in 1997 built an adobe ecolodge called the Adrere Amellal ("White Mountain"), Baghi "knows how much of the modern world Siwa can accommodate without losing its traditions. Abdallah can talk to the community informally and let them see the bigger picture. He understands that things are going to change, but with his help, Siwa can manage the transition."

**Sylvia Smith** is a BBC reporter who specializes in North African and Middle Eastern cultural affairs. **Laura El-Tantawy** (ltjournalist@yahoo.com) is a free-lance photojournalist based in Cairo and a contributor to Corbis Images.

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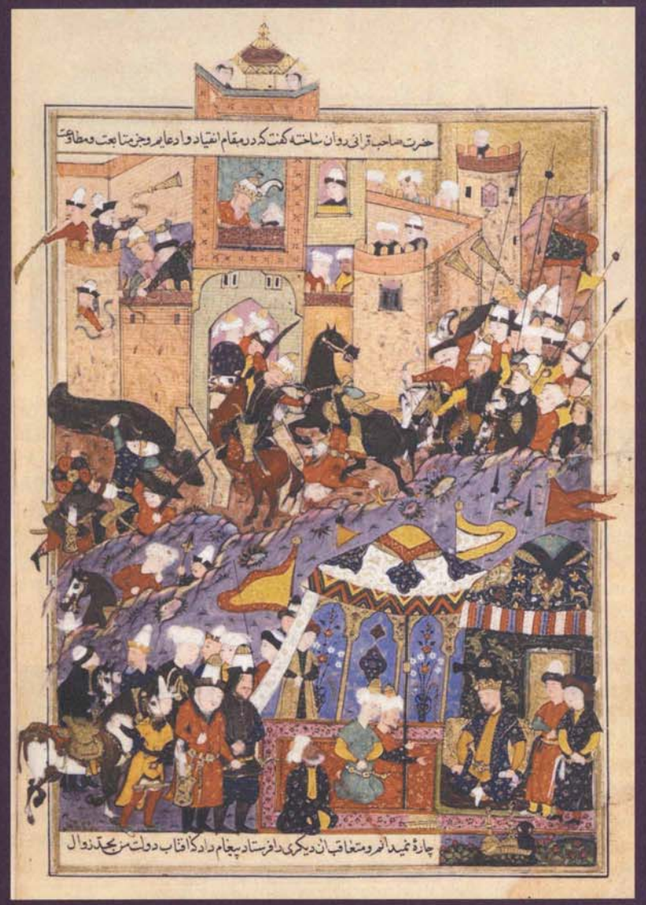
# The Diplomacy OF THE SONS

WRITTEN BY CAROLINE STONE

It was the year 1404. Timur, who had conquered Asia from Egypt and Syria to the borders of China, was poised to march his armies on the Ming emperor of China.

Timur was known in the West as Tamerlane. In his own realms, he was called Sahib-i-Qirani, "Lord of the Fortunate Conjunction of the Planets." The reason he was prepared to go to war was the way he was referred to in a letter that had arrived eight years earlier, in 1395, carried by an official embassy of more than 1500 men from Hung Wu, the first Ming emperor.

There had been a number of similar missions in previous years between the Ming court in Khan Baliq (modern Beijing) and that of Timur, in his new capital of Samarkand. Timur's realms had engaged in a lively trade in horses, highly desirable to the Chinese, and one chronicle put the annual export figure at 1000 head, which Timur found "satisfactory."



This painting from a 16th-century copy of the Persian historian Mirkhvand's *Rawzat al-Safa (Garden of Purity)* shows Timur receiving envoys during his 1370 attack on Balkh, now in northern Afghanistan. It was a far larger embassy that came to him 25 years later, bearing the first of two letters from the Ming court of China that Timur found profoundly insulting.

In the provocative letter, however—as was Chinese custom—Timur was addressed as a vassal, his "submission" to Hung Wu was graciously accepted, and he was invited to pay homage to the Dragon Throne and, furthermore, to send tribute. Timur was enraged at the idea that he could be considered anything but sovereign and—to him—the insult was worse coming from a ruler he considered an infidel.

Timur loved war and conquest as much as his Mongol forebears, and war was his response to the insult—but slowly. His sack of Delhi in 1398 and his capture of the Ottoman Sultan Bayazit at Ankara in 1402, as well as other campaigns, preoccupied him over the following years, though he never took his eye off China. When a second letter arrived from Hung Wu inquiring why he had not paid tribute for the past seven years, he mobilized some quarter of a million men and set out for China.



PAUL LUNDE; NATIONAL PALACE MUSEUM, TAIPEI / BRIDGEMAN ART LIBRARY; OPPOSITE: BRITISH LIBRARY

It is unclear just how seriously the Chinese took the threat Timur represented. They could face him with their standing army of more than a million men, and they were long accustomed to trouble on their western border. There is no evidence, however, that they were expecting anything on the scale of the Mongol invasions of 1279, which had overthrown the Chinese Sung Dynasty for the Mongol Yuan, and yet such an overthrow is almost certainly what Timur intended, although he did not issue an explicit threat to the Ming emperor.

The two letters followed Chinese protocol, without a scrap of concern for the recipient's sensibilities, and set in opposition two great empires, threatening perhaps 20 percent of the world's population with the shockwaves of war.

Then, on February 18, 1405, leading his army toward China, Timur died at Otrar, in today's Kazakhstan, aged approximately 68.

In China, too, not long after the second letter was sent, the Dragon Throne stood empty with the death of Hung Wu and the country was embroiled in the turmoil of succession.


Left: **A statue of Timur, known in the West as Tamerlane, stands in the main square of Shakhrisabz, the town where he was born, about 160 kilometers (100 mi) from Samarkand in today's Uzbekistan.** Above: **Founder of the Ming Dynasty in 1368, Chu Yüan-chang is commonly known by his regnal title, Hung Wu. He was born a peasant in 1320 near Nanking.**

As so often in history, the conflict was a matter of cross-cultural misunderstanding, a collision of worldviews. The Chinese believed absolutely in their national superiority (even in periods when the ruling class was not actually Chinese); China, they repeatedly claimed, needed nothing from anyone else. Countries beyond the Chinese borders were, by definition, inferior. Ambassadors and other emissaries bringing gifts and trade goods were understood to be vassals offering tribute to a superior power, for which the superior power—*noblesse oblige*—graciously rewarded them.

From Samarkand's point of view, however, the horses and other items sent to China were trade goods politely disguised as diplomatic gifts. Timur's intention was to encourage good relations and do business. He had no doubt of his personal superiority to any ruler on earth, nor, furthermore, of every ruler's duty to show submission and obedience to *him* as a representative of Islam. From its earliest times, the merchant has had a high place in the Muslim social hierarchy—the Prophet Muhammad was himself a merchant—and hence the Timurid ambassadors to China were essentially perceived as being on trade missions, opening up new markets and establishing new relationships along the Silk Roads, as well as finding out what they could of military and practical use about their powerful neighbor.

And so, each convinced of its own self-evident superiority, neither side was the slightest bit interested in the other's culture or religion.

One early account of these events comes to us from Ruy González de Clavijo, an ambassador to the Timurid court from that of Henry III of Castille, Spain. He was there because Timur had recently returned to Spain a number of Christian women liberated from Bayazit's harem at the fall of Ankara. Henry saw this as a good occasion to thank Timur and to cement good relations with a power that Europe hoped might prove an ally against the dreaded Turks. In addition, the 15th century was a time of broadening horizons in Europe and deepening curiosity about the world. Clavijo left a detailed account of his mission, including a description of the reception of the Chinese legation at Timur's court. (See "Clavijo's Account of Timur's Displeasure." page 9.)

The struggle for the Timurid succession began immediately after Timur's death and lasted several years, but by 1409, Timur's son Shah Rukh had emerged as the undisputed heir of his father's empire. In China, major changes were also under way: After dynastic fighting, Yung Lo, son of Hung Wu, had taken the throne as the third Ming emperor in 1403.

In his 1395 letter, the emperor addressed Timur as a vassal.

The sons were very different from their fathers. Shah Rukh was married to one of the most remarkable women of the age, Queen Jawhar Shad, with whom he shared wide cultural interests. He largely eschewed military exploits. Herat had long been his personal capital, and under his rule it

became a city of great beauty, a center of the arts and learning famed for its cosmopolitanism. Shah Rukh was curious about foreign lands, and he encouraged ambassadors and foreign missions. Clavijo records that he was invited to visit Shah Rukh while en route to see Timur in Samarkand, but could not make the detour to Herat for fear of displeasing Timur.

Yung Lo was the son of a man who had been born a peasant but had risen to overthrow the Yuan Dynasty that had ruled China for a century. A military man, Hung Wu had also been concerned with the restoration of traditional Chinese Confucian values, including the neo-Confucian view that the emperor of China was ordained by heaven to rule the entire world, Chinese and non-Chinese alike. He fostered agriculture, and China's standard of living rose dramatically; he legislated against merchants, whom he perceived as parasites and exploiters. Under his rule, foreign traders could only enter China with special permits—essentially in the company of diplomatic missions.


Above: **Fourth among Hung Wu's 26 sons, the third Ming emperor is known as Yung Lo or "eternal joy"; his given name was Chu Ti. His 22-year reign was the pinnacle of Ming power.** Right: **Likewise a fourth son, the infant Shah Rukh is presented to his father, Timur, in this painting from the 17th-century *Zafarnama* by Sharaf al-Din Yazdi.**

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The Chinese were particularly keen on western horses and birds of prey, the Timurids no less on silk and porcelain.

Yung Lo had spent his youth on China's northwest frontier engaged in forestalling any repetition of the Mongol invasions from the direction of the Gobi desert. After his father's death, he fought his nephew for the throne and won. Yung Lo was interested in extending China's power both militarily and diplomatically: He tried to capture Annan—approximately coterminous with modern Vietnam—which led to years of guerrilla warfare; he was also the only Chinese emperor ever acknowledged as overlord by Japan. Yet like Shah Rukh, Yung Lo also passionately wanted to know more about foreign countries, and it was under his rule that the famous voyages of Zheng He were sent out to research and trade beyond the maritime boundaries of China. His was a bold approach to the outside world.

In both countries, the succession struggles were costly, especially for Shah Rukh. The turmoil depleted the energy and resources needed to resume the hostilities that had loomed in 1405. While Timur or Hung Wu might have fought anyway, regardless of the further, possibly disastrous, costs, the fact that their sons found a path away from war marks them as men of distinctly different character and temperament from their fathers. Signs of rapprochement began early: In 1407, Shah Rukh's rival Khalil Sultan returned the surviving members of the Chinese missions of 1395 and 1397, who had had to remain in Samarkand, dispatching them together with escorts and gifts. These gifts were, inevitably, perceived by Yung Lo as tribute, but nonetheless his reciprocal gesture was much appreciated: He sent back envoys with instructions—among other things—to offer sacrifices at Timur's tomb.

After Shah Rukh came to the throne, the flow of embassies continued, most setting out from Samarkand (and a few from Herat) along the Silk Roads. Most would stop and pray for a good journey at the Mosque of the Travelers, today known as the Mosque of Khidr, built on the site of an ancient fire-temple overlooking the Iron Gates of Samarkand.

The Chinese remained particularly keen on western horses and falcons and other birds of prey, as well as leopards and other exotic beasts, jade, sal ammoniac and various native products. The return gifts were almost invariably different kinds of silk, robes, silver and paper money, and occasionally porcelain. It suited the Chinese to have these exchanges, as they enabled China to obtain foreign luxuries while maintaining the myth of Chinese self-sufficiency. Central Asia was more frankly interested in commerce. It seemed that the relationship was stabilizing and would continue to do so as long as each side remained free to misinterpret the other in its own way.

But in 1411, trouble arose again. Yung Lo, acting on out-of-date



## Clavijo's Account of Timur's Displeasure

*Clavijo, too, evidently misunderstood the nature of Timur's relations with China, for Timur never for one instant considered himself a vassal of the Chinese emperor.*

Those lords now conducting us began by placing us in a seat below that of one who it appeared was the ambassador of Chays Khán, the emperor of Cathay. Now this ambassador had lately come to Timur to demand of him the tribute said to be due to his master, and which Timur year by year had formerly paid. His Highness at this moment noticed that we, the Spanish ambassadors, were being given a seat below that of this envoy from the Chinese Emperor, whereupon he sent word ordering that we should be put above, and that other envoy below. Then no sooner had we been thus seated than one of those lords came forward, as from Timur, and addressing that envoy from Cathay publicly proclaimed that his Highness had sent him to inform this Chinaman that the ambassadors of the King of Spain, the good friend of Timur and his son, must indeed take place above him who was the envoy of a robber and a bad man, the enemy of Timur, and that he his envoy must sit below us: and if only God were willing, he Timur would before long see to and dispose matters so that never again would any Chinaman dare come with such an embassy as this man had brought. Thus it came about that later at all times during the feasts and festivities to which his Highness invited us, he always gave command that we should have the upper place. Further on the present occasion, no sooner had his Highness thus disposed as to how we were to be seated than he ordered our dragoman to interpret and explain to us the injunction given in our behalf. This Emperor of China…[rules] an immense realm, and of old Timur had been forced to pay him tribute: though now as we learnt he is no longer willing, and will pay nothing to that Emperor.

*—Clavijo: Embassy to Tamerlane, translated by Guy LaStrange (London, 1928) pp. 222–3.*

## From the Account of Ch'en Cheng

### On Islam

A person who understands the interpretation of the classics of the Muslim religion is called a man-la [*mulla*] and is revered by the common people. In the mosque the man-la sits on the right side of the common people. Even the ruler of the state honours him. When they pray, only the man-la chants. …In the capital there is a big earthen building called a mo-te-erh-sai [*madrasah*]. The verandas are broad on all four sides of the building. In the small courtyard, there is a copper vessel similar to a cooking pot several chang in circumference [possibly containing water for ritual ablutions]. Writing is engraved on its top and it is similar in form to a *ting* tripod. In every direction the rooms are beautiful, and many contain roaming students and people who truly understand the classics. They are similar to China's great schools.

*—Rossabi pp. 51–53*


### On Horses

Many people produce fine horses and love to shelter them carefully. All the horses are kept in earthen buildings underground where they are fed and nourished. Wind and sun does not, in this way, bother them; in winter, they are warm and in summer they are cool.

*—Rossabi p. 55*

### On Windmills

The water mills are similar to those in China. They also have windmills which are fashioned after the walls of buildings. On the top of the walls are four sides with open doors, and outside the doors are screens which welcome the wind. On the wood all around are blades to take advantage of the wind. At the bottom of the wood, there is a millstone. When the wood blows from any direction, the poles revolve and move. From any direction, these poles catch the wind.

*—Rossabi p. 55*

information, ordered Shah Rukh and Khalil Sultan to stop fighting. But Khalil Sultan was already dead, and Yung Lo's letter, like that of his father 16 years earlier, took an offensively arrogant tone: Yung Lo styled himself "Lord of all the Realms of the Face of the Earth" and addressed Shah Rukh as his vassal. Shah Rukh, for all his cosmopolitanism, was furious, and is said to have sent a rejoinder to the effect that the sooner the emperor of China converted to Islam the better it would be for all concerned.

There is no record in China of the receipt of Shah Rukh's letter, however, and scholars have suggested that the envoys and translators may have—wisely—suppressed it, or modified it upon delivery, in effect giving it a different "spin." If the letter had been delivered as written, it is unlikely that Yung Lo would have ordered a major mission to set out for Central Asia in 1413, led by Ch'en Cheng, a Chinese civil servant with wide experience of foreigners. By great good fortune, two documents of Cheng's relating to his journey survive: one a rather uninformative diary, which breaks off suddenly; the other a fascinating account of his experiences. Central Asian envoys accompanied this mission back to China with, among other gifts, a white horse for the emperor.

In 1417, another Chinese embassy arrived at Shah Rukh's court with lavish presents and a letter from Yung Lo. In it he wrote that "[f]rom both sides they [the Ming emperor and the Timurid sultan] should lift the veil of difference and disunity and order the opening of the door of agreement and unity, so that subjects and merchants may come and go at will and the roads may be secure."

This was an extraordinary perception of the realities of the situation and showed an unprecedented willingness by Yung Lo to modify his approach. At a more personal level, he sent to Shah Rukh a portrait of the white horse, indicating it was a gift that had been unusually appreciated.

**Near the Timurid eastern gate of Samarkand stands the Mosque of Khidr, also known as the Mosque of the Travelers, where it was customary for Muslims to pray for safety on their journeys.** Right: **The decoration of the ceiling of the Rukhobad Mosque, built about 1380, shows strong Chinese influence.**

The Chinese ambassadors were lavishly received and entertained—in striking contrast to the experiences of Chinese envoys described by Clavijo little more than a decade earlier. Again, Central Asian delegates accompanied the mission's return to China.

In 1419 and 1420, large-scale missions again set out in both directions. The delegation from Central Asia was of particular significance in that not only Shah Rukh but also five other princes and local rulers sent representatives. As in the case of the 1413 embassy from China, we are extremely fortunate in having an account of the journey, which has been preserved by the historians of the period:

> "In the year 822 [1419] his...Majesty Mirza Shah Rukh appointed a group, at the head of which was Shadi Khwaja, on a mission to Cathay. Along with them Prince Mirza Baysunqur sent Sultan Ahmad and Khwaja Ghiyathuddin Naqqash, who was an artist of no mean talent. He established with the Khwaja that, from the day they returned, they would record on the pages of their notebooks, without addition or deletion, all they witnessed—events, condition of roads, construction of towns, description of garrisons, situations of buildings, condition of kings, and so on. When the emissaries returned, Khwaja Ghiyathuddin, in compliance with the order, presented written down in the form of a journal all he had seen, the choicest marvelous tales and rare stories of which will be quoted from his report, for the verity of which he is responsible."

Unfortunately, none of Ghiyathuddin's sketchbooks, which must surely have accompanied the written text, are known to have survived.

What is so remarkable about Ghiyathuddin and Ch'en Cheng's narratives, and indeed also that of Clavijo, is the wide-ranging intellectual curiosity they exhibit and their generally tolerant attitudes. Although we know that two of the writers were, respectively, a devout Muslim and a devout Catholic, and that Ch'en Cheng, as a Chinese civil servant, must have been deeply imbued with Confucian ethics, in their accounts, interest overcomes prejudice. Obviously, there were things of which they must have disapproved: Clavijo, a teetotaler, did not much enjoy the partying at the Timurid court;

> In 1417 Emperor Yung Lo wrote that he and Shah Rukh "should lift the veil of difference and disunity...."



## From the Account of Ghiyathuddin Naqqash

### A Conversation With Yung Lo

The emperor asked, "In your country, is grain expensive or cheap? Is welfare for the privileged few or widespread?"

"Grain is beyond the boundaries of perfection," [the emissaries] replied. "And welfare is more inexpensive and more widespread than can be imagined."

"Yes," he said, "when the ruler's heart is with the Lord, the Creator bestows bountiful welfare." Then he said, "I have in mind to send an emissary to Qara Yusuf [ruler from Iraq to Anatolia] and request from him some good-tempered horses, for I have heard that in his realm there are excellent horses." Then he asked, "Are the roads safe?"

The emissaries answered, "Within the realm under Shah Rukh Sultan's command, people come and go with utter peace of mind."

"So I understand," he said. "Now, you have come a long way. Arise and have some food." *—Thackston p. 289*

### Yung Lo's Secretaries

On either side of the emperor's dais were seated two girls with faces like the moon and countenances like the sun, hair of ambergris knotted on top of their heads, their faces and necks exposed, and lustrous pearls in their ears. They held paper and pens in their hands and waited to write down what the emperor said in order to report when he went into the private quarters. If a correction or change was to be made, they sent the writing out to the clerks to implement the order. *—Thackston p. 288*

# Spin?

## The Chinese Version of Timur's Letter to Hung Wu in 1394

*The Chinese official histories recorded important letters—but did they record them accurately? There are elements in this letter of 1394 that suggest it is based on a genuine document, but neither the extreme humility nor the statement that the emperor, a non-Muslim, was bringing enlightenment to the world sound like anything Timur could conceivably have said or ordered written. Did Chinese clerks do a little rewriting? Or—less likely—was it Timur's own Persian scribes who discreetly rewrote the text before it was sent out? In either case, it is possible that the humble tone of this letter evoked the arrogant tone of Hung Wu's 1395 letter to Timur—the letter that so enraged him that it nearly precipitated a war.*

I respectfully address Your Majesty, great Ming Emperor, upon whom Heaven has conferred the power to rule over all countries. The glory of your charity and your virtues has spread over the whole world. The people prosper by your grace and the kingdoms lift up their eyes to you gratefully. All they know is that Heaven wishes to regulate the ruling of the people, and ordered Your Majesty to arise and accept the fate of the throne and be Lord over the myriads.... The nations which never had submitted now acknowledge your supremacy, and even the most remote kingdoms, involved in darkness, have now become enlightened.... Whereby have we merited such favor? ...I see with deference that the heart of Your Majesty resembles the vase which reflects what is going on in the world [a reference to the Vase of Jamshed, an image much used by the Persian poets].... I can only return Your Majesty's kindly disposed feelings by praying for your happiness and long life. May they last eternally like heaven and earth.

*—From the* Ming Shi (Ming Chronicle), *adapted from the translation quoted in E. Bretschneider,* Medieval Researches from Eastern Asiatic Sources, *Vol. II (London, 1888) pp. 258–260.*

UPPER: ALEXANDER STONE LUNDE; LOWER: PAUL LUNDE

Ghiyathuddin was disturbed by the implications of the *kowtow*. But on the whole, they were much more concerned with observing and comparing than with criticizing.

Their accounts are widely different in style: Ch'en Cheng is extremely informative, but rather dry and impersonal; Ghiyathuddin describes with an artist's eye the buildings and spectacles, and his pleasure at the lavish receptions and a wealth of visual details is obvious.

Of course, the emissaries were, in some sense, spies, or at least "intelligence operatives," and their diaries were intended to provide information and guidelines for subsequent missions, which may explain the detailed descriptions of architecture and entertainments, as well as data of use to merchants, details on the communications and postal systems, and the workings of the bureaucracy and law, in addition to general geographical and sociological information.

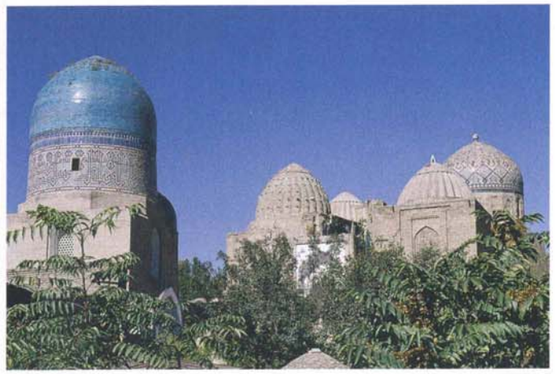
There is very little evidence of direct military reconnaissance, except in Clavijo, who was caught up in Timurid dynastic wars on his way home and who found military matters laid out before his eyes. Yet it is difficult to believe that such information would be absent from the reports of such embassies. Perhaps the ambassadors were closely guarded and unable to learn much, or, more probably, the classified information was reported only orally or in top-secret "burn after reading" reports that have not survived to this day.

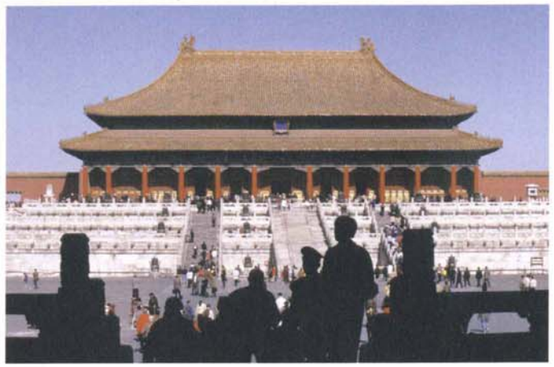
Envoys continued to be exchanged until the death of Yung Lo in 1424. His successor once again withdrew China from contact with the outside world: The voyages of exploration—notably those of Zheng He—were, like the embassies, felt to be extravagant and dangerous, potential sources of cultural, political and religious pollution by non-Chinese. This was a strict Confucian view, and the swiftness of China's withdrawal highlights the degree to which the voyages and contacts of Yung Lo's reign were due to the emperor's personal interest and intellectual curiosity.

Shah Rukh lived considerably longer, until 1447. After his death, things changed in Central Asia, too. Timur's empire fragmented, Uzbek invasions altered the cultural frames of reference, shifting trade patterns decreased Silk Roads trade and, increasingly, the area became a geopolitical and cultural backwater. Shah Rukh's intellectually curious, tolerant heirs looked southward and built another empire: that of Mughal India.

The events of these years marked an evolution in international relations. No doubt the changes were born of expediency. Shah Rukh's refusal to subscribe to the Chinese worldview forced the Chinese to approach him by a new path, as the shift in tone of the letters from China between 1410 and 1418 shows. And he, too, moved on a long way, in terms of openness and political sophistication, from the brutal methods of his father. Like Yung Lo, through effort and repeated contact, Shah Rukh had clearly come to realize that he was dealing with a complex culture, one that was as deep-rooted as his own and which could not be altered simply by threats. Both rulers learned how to adapt to another's point of view.

Each could have chosen war. Either could have cut off all relations, for neither empire needed the other in any vital way. But instead, Shah Rukh and Yung Lo both chose the long, slow path of compromise and diplomacy, thus earning peace and prosperity for their people and, for themselves, a historic reputation as rare rulers who were both wise and virtuous.





Upper: **Timur and his descendants, including Shah Rukh, are buried in the Shahr-i-Zindah complex in Samarkand.** Above: **The Hall of Supreme Harmony in Beijing's Forbidden City was built by Yung Lo in 1406.** Opposite: **An anonymous Chinese street scene during the Ming Dynasty.**

**Caroline Stone** (stonelunde@hotmail.com) divides her time between Cambridge and Seville. She is currently working with Paul Lunde on a book about the journeys of Ibn Fadlan and other Arab travelers to the north, scheduled to appear in 2007.

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## Diplomacy Along the Silk Roads

*In the late 14th and early 15th centuries, there were some 30 recorded diplomatic missions between China and Central Asia; two-thirds of them took place in the first quarter of the 14th century.*

| | |
|---|---|
| c.1330–1340 | Timur born. |
| 1395 | Embassy from China brings letter to Timur. |
| 1397 | Another mission from China to Central Asia. |
| 1398 | Timur sacks Delhi. |
| 1402 | Timur captures Ottoman Ankara and sends embassy with freed Christian women to Henry III of Castile. |
| 1403 | Yung Lo comes to the throne in China. |
| 1403–1406 | Timur's envoy returns to Samarkand, and Henry III sends Clavijo with him. |
| 1405 | Timur dies at Otrar. |
| 1405–1408 | Timur's heirs struggle for supreme power. |
| 1407 | Khalil Sultan, one of Timur's heirs, returns members of 1395 mission. |
| 1408/1409 | Shah Rukh emerges as heir to Timur's empire. |
| 1411 | Yung Lo orders Shah Rukh to stop fighting members of his family; diplomatic relations are again jeopardized. |
| 1413/1414 | Major mission from Yung Lo headed by Ch'en Cheng. |
| 1417/1418 | Another large Chinese mission to Central Asia. |
| 1419/1420 | Large mission from Central Asia to China accompanied by writer and court painter Ghiyathuddin Naqqash. |
| 1424 | Yung Lo dies. |
| 1426–1435 | Hsüan Re closes China to the outside world. |
| 1447 | Shah Rukh dies. |


**The Albolafia *noria*, or waterwheel, is the last vestige of an array of mills and dams built on the Guadalquivir River in Córdoba between the eighth and 10th centuries. It appears on this carved-stone seal of the city,** left, **and in its present condition,** opposite. Below: **Gravity-fed fountains embellish a courtyard at the heart of the Alhambra's sprawling, elaborate Generalife Gardens in Granada.**

TOR EIGELAND; BELOW AND OPPOSITE: DICK DOUGHTY

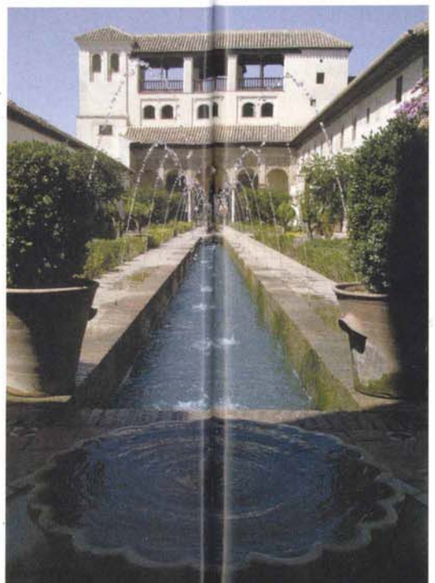
# THE ART & SCIENCE OF WATER

WRITTEN BY RICHARD COVINGTON

"Watch your step!" warns Pedro Marfil. As we gingerly pick our way across the slate rooftop of Córdoba's eighth-century Mezquita (Spanish for "mosque"), the medieval archeologist does not have to warn me twice. So what if we are a mere 21 meters (70') in the air? It's still a dizzying drop, made more so by the broiling July sun. With each step, I hear the disconcerting squelch of sandal-sole rubber melting underfoot in the 44-degree (112° F) heat. I think longingly of the cool, dark interior below, with its pillared forest of double-tiered red-and-white striped arches.

But Marfil is showing me the ingenious grid of gutters, pipes and miniature aqueducts once used to capture precious rainfall and channel it to giant cisterns (*aljibes* in Spanish; *jubb* in Arabic) beneath the patio below. From the Middle Ages until the 1950's, the patio was a cemetery, the derelict cisterns were filled with bones, and the runoff fed the fountains, he says. Now the patio's well-ordered grove of cinnamon, orange, olive, palm and cypress trees has been restored to the glory it originally enjoyed under the Umayyad rulers, and the cisterns once again collect water for use in the Mezquita. Up on the roof, on this blast furnace of a day, it is perfect weather for appreciating the historic Arab skill of trapping, storing and managing that evanescent, life-giving commodity, water.

Gesturing toward a towering wooden waterwheel a few hundred meters away along the broad Guadalquivir River, Marfil explains that it's the ruined Albolafia *noria*, among the last vestiges of the masterful panoply of mills, dams, flood protection and canals that the Umayyads built between the eighth and 10th centuries. (The name of the river comes from the Arabic *al-wadi al-kabir*, "great river.") Barely visible in the shallows are also the remnants of an imposing dam, a nearly three-meter-thick (10') barrier built of stone imported from North Africa and marble columns that once rose three meters above the waterline. In the Islamic era, when the mills were in operation, trip-hammers attached to the axles of waterwheels pounded out paper pulp, husked rice and crushed sugarcane in a process imported from China.



Peering down the narrow street between the Mezquita and its neighbor, the Alcázar, a palace converted into a museum, Marfil traces the former path of an aqueduct, now long gone, erected on Roman foundations by ninth-century Caliph Abd al-Rahman II to bring spring water from the Sierra Morena range, 80 kilometers (50 mi) west. By the 10th century, at a time when no city in western Christendom was larger than 10,000 souls, Córdoba boasted a cosmopolitan population of half a million, sustained by one of the most advanced water systems in the world.

Seven kilometers (4.4 mi) west of the city, among the sprawling ruins of Madinat al-Zahara, the garden capital built by Abd al-Rahman III, archeologists have uncovered evidence of a staggering 300 baths—many lavishly painted—as well as artificial fishponds, sculpted marble pools and basins fed by a network of aqueducts and subterranean canals.

From the ninth through the 16th centuries, Islamic societies from Spain to Oman experienced a "golden age" of science and technology. One of the most important of these technologies is also today one of the least thoroughly studied: hydrology, or the control of the movement of water. The rise of cities like Córdoba, Damascus, Baghdad, Fez and Marrakech all required increasingly sophisticated methods of water management to supply rapidly growing populations. Integrating, adapting and refining irrigation techniques and water distribution methods from India, Asia and Rome, Muslim water engineers, starting as early as the seventh century in Arab countries and around the 10th century in Spain, built an agricultural revolution. Unified by a common language, these Arabic-speaking scientific pioneers sowed their expertise from East to West, and their inventive solutions to the challenges of widely varied terrain underpinned the unprecedented prosperity of the era, says Mohammad El Faïz, an economics historian at Cadi Ayyad University in Marrakech.

MUSLIM CORDOBA'S 10TH-CENTURY POPULATION OF HALF A MILLION WAS SUSTAINED BY ONE OF THE MOST ADVANCED WATER SYSTEMS IN THE WORLD.

One of the earliest Arabic texts explaining how to locate aquifers, dig survey wells and build underground canals, *Anabat al-Miya al-Khofia (The Extraction of Hidden Waters to the Surface)* was written in Baghdad in the 10th century by the Persian

mathematician Muhammad al-Karaji. Meanwhile, physician-philosopher Ibn Sina (Avicenna), who lived primarily in Isfahan and Hamadan between 980 and 1037, established hydraulics as an independent discipline on a par with geometry and astronomy.

The methodology, machines and discoveries surrounding water had far-reaching impacts not only on agriculture, but also on science, law and social organization—both across the Arab empire and beyond, across the Atlantic. According to Ahmad Hassan of Aleppo University and the late British scholar Donald Hill in their classic 1986 analysis, *Islamic Technology*, "Muslim irrigation systems with their associated hydraulic works and water-raising machines remained the basis for Spanish agriculture and were transferred to the New World." After the 15th century, Arab-inspired techniques were adopted in the Canary Islands and as far away as Texas and Louisiana, partly to irrigate thirsty sugarcane fields, explains Antonio Malpica, a professor of medieval history at the University of Granada and an expert on Islamic technology in Spain. In France, he adds, Provençal engineers in the 11th to 13th centuries copied Islamic irrigation networks, and some of them are still in use today.

This quantum leap of experimentation shook the Islamic world. In Diyarbakir in upper Mesopotamia (now in present-day Turkey), the 13th-century engineer al-Jazari designed astonishing hydraulic pumps and ingenious water clocks based on principles so advanced they would not be seen in the West for another 300 years, when Leonardo da Vinci and other Italian inventors copied them. Hassan and Hill note that some are regarded as precursors of the first steam and internal-combustion engines.

In Iran, North Africa and Spain, subterranean canals equipped with a series of ventilating shafts leading to the surface were built to extend 20 kilometers (12 mi) or more. Like more basic devices, they had existed for centuries before Islamic civilization adopted and refined them: According to historian Charles Singer, they were carried from Armenia to Persia around the sixth century BC, and from there spread west to Egypt and across North Africa to Morocco.

Left: **In Iran, excavation spoil rings the entrances of the numerous vertical shafts that allowed for safe digging and periodic cleaning of the underground canals known as *qanats*.**

TOR EIGELAND; OPPOSITE: BILL HOCKER

Malpica observed that the Arabs preferred to irrigate by canals from underground springs because—unlike rivers, which often dried up in the summer—the water was available year-round.

Islamic engineers used astrolabes, spherical and plane trigonometry, and complex surveying techniques to lay out the canals and to site dams, many of which were built so solidly they have endured into modern times. In Saudi Arabia, for example, about one-third of the dams constructed in the seventh and eighth centuries are still intact, according to Dutch historian Nicholas Schnitter. In the Spanish province of Valencia, eight 10th-century Muslim dams spanning the Turia River still supply much of the region's irrigation needs. Elsewhere in the former al-Andalus (the Arab name for the southern Iberian peninsula), Syrian immigrants dammed rivers from the Ebro in the north, near Zaragoza, to Córdoba's Guadalquivir in their attempts to replicate the perfumed gardens of the Ghuta oasis of Damascus.

MANY TENETS OF CIVIL AND PROPERTY LAW ACROSS THE ISLAMIC WORLD ORIGINATED IN THE NEGOTIATION OF WATER RIGHTS.

Water projects frequently attained proportions not seen since such great Roman works as the 100-kilometer (62-mi) aqueduct from the Eifel Mountains to Cologne. In the 10th century, the chief hydraulic engineer of Merv (now in Turkmenistan) commanded 10,000 workers who built and maintained irrigation canals and dams, and the resulting series of 10 norias and attached mills stands out today as one of the hydrological wonders of the country.

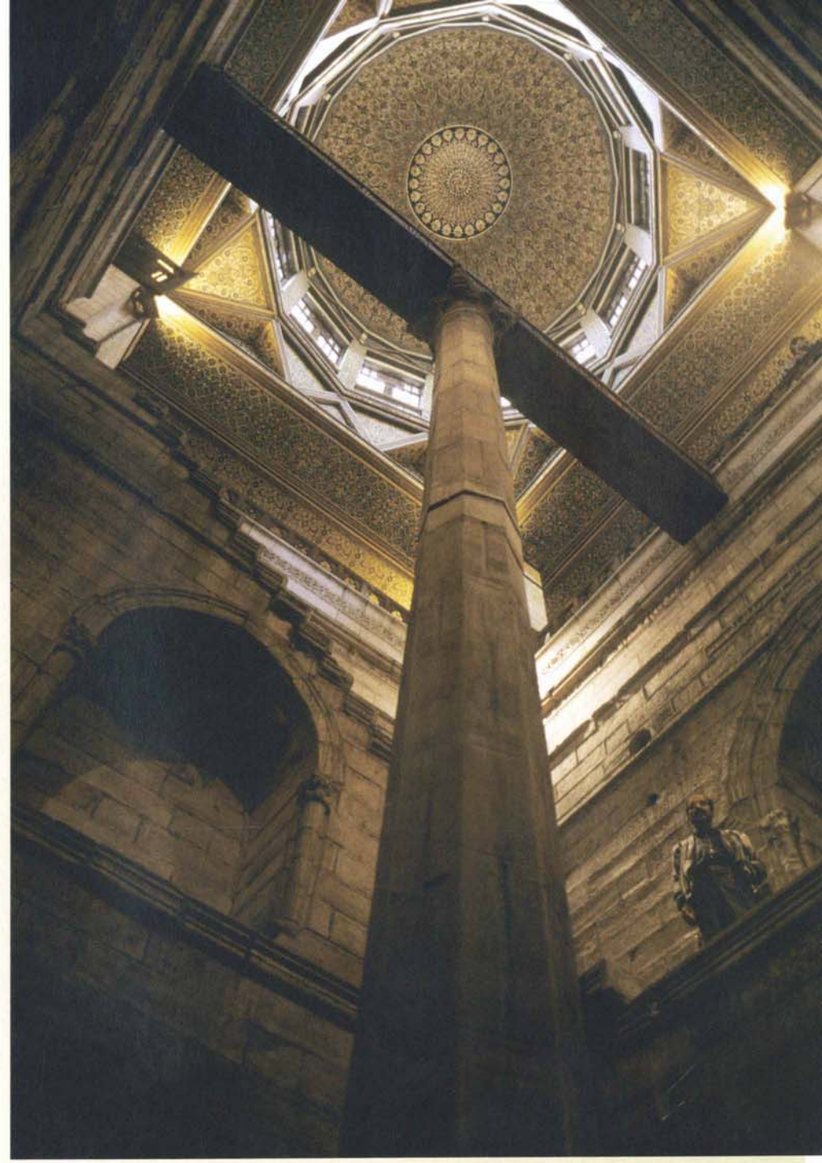
Earlier, in the ninth century, Zubayda, wife of the Abbasid caliph Harun al-Rashid, created a series of wells, reservoirs and artificial pools that provided water for pilgrims all along the route from Baghdad to Makkah. The route has been called Darb Zubayda ("Zubayda's Way") ever since. A century later, enormous floating mills, built of teak and iron, were moored midstream in the Tigris and Euphrates rivers to take advantage of the constant current to grind up to 10 tons of corn a day.

Such scale was not, however, without pre-Islamic antecedents: At Marib in Yemen, one colossal project in the seventh century BC raised a dam 600 meters long and 14 meters tall (1950' by 45'), flanked by sluices, spillways, a settling tank and a distribution tank. This technological marvel of the ancient world functioned for a thousand years, then collapsed and was rebuilt twice, and finally collapsed a third time, after which its Himyarite engineers lacked the ability to reconstruct it.

All this water management led to the creation of law: Many fundamental tenets of civil and property law across the Islamic world originated in the contentious give-and-take process of establishing water rights. An early example is the *Kitab al-Qina*, a code regulating water distribution drawn up by Ibn Tahir, the ninth-century governor of Khurasan province in Iran.

"Water tribunals are a much-neglected aspect of Arab civilization," El Faïz points out, "even though they frequently served as models for social organization." In a tradition harking back to Islamic rule, one of these tribunals continues today, in Valencia, where elected representatives of the Andalusian province's eight irrigation grids gather outside the city's cathedral every Thursday to share out water and settle disputes.

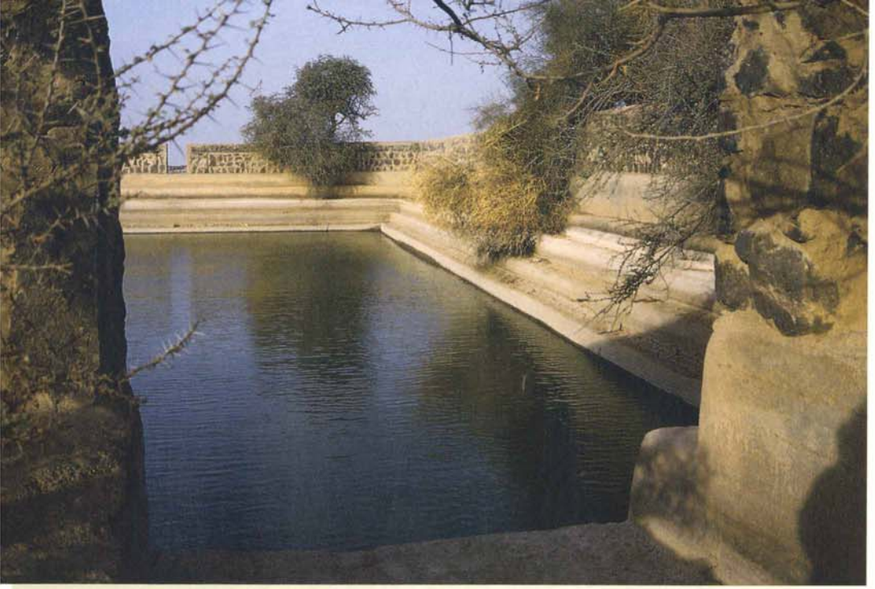
Although peasants and farmers generally managed smaller installations, major waterworks came under government control. Under the Ayyubids and Mamluks, sultans and large landholders took responsibility for digging and cleaning canals and maintaining dams, according to Salah Zaimeche, an Algerian-born historian of science at Manchester University's School of Environment and Development in the UK.



**In Cairo, the most elaborate of the "nilometers"—instruments which measured the height of the river's all-important annual flood—was built in 870; it served until the 20th century.**

Charles Singer, a pioneering Oxford professor of the history of science and the author of a landmark five-volume survey of technology, was one of the first western scholars to acknowledge Arab scientific primacy in the Middle Ages. Writing nearly 50 years ago, Singer contended that during most of the period from 500 to 1500, "technologically, the West had little to bring to the East. The technological movement was in the other direction." Hill pointed out that a crucial portion of this scientific edge lay in water management, where curved dams, desilting sluices and hydropower were all Muslim inventions.

And although Singer's and Hill's views are increasingly part of an emerging historical consensus, there remains a long-standing ignorance obscuring Arab scientific achievements that is particularly acute when it comes to water. "Many historians still believe that nothing important in hydraulic engineering occurred between the fall



One of dozens of rest and water stations on the pilgrim road from Iraq to Makkah, this pool at Aqiq, Saudi Arabia, still holds water more than a thousand years after it was constructed under the patronage of Zubaydah, the wife of caliph Harun al-Rashid. Below: Built to impound floodwaters in northwestern Saudi Arabia, the Sadd Qasr al-Bint dam was one of numerous engineering projects throughout the Arabian Peninsula.

of the Roman Empire in the fifth century and the beginning of the Renaissance in the 15th century," grouses El Faïz. Counterarguments from prominent scholars such as Lynn White Jr. of the University of California at Los Angeles and the late Jean Gimpel have largely dismissed Islamic contributions to science and insisted that most Arab technology was either imported from China and India or imitated from Greek and Roman models.

Zaimeche counters that while the Romans left aqueducts, dams and other hydraulic works in Spain and North Africa, most were close to ruin, and the Muslims brought more elaborate and efficient techniques.

Malpica points out that where the Romans ordered their troops to erect stone aqueducts and other massive structures, Muslim projects were typically undertaken by ordinary farmers. "It was Arab peasants who designed and built these systems, not soldiers," he says. "There were some specialists for large constructions like the Alhambra, but in general, everyone was familiar with the way irrigation worked."

This was, he explains, less intrusive, even eco-friendly. "The Moorish peasants found smaller solutions that were largely hidden, subtly transforming the landscape without moving great amounts of terrain," the Granada professor continues. "If you create a *qanat*, there's still a lot of vegetation around what is in effect a small stream." It was not at all the same scale of engineering required for a stone aqueduct to cross, for example, the 800-meter-long (2625') chasm in Segovia, he explains.

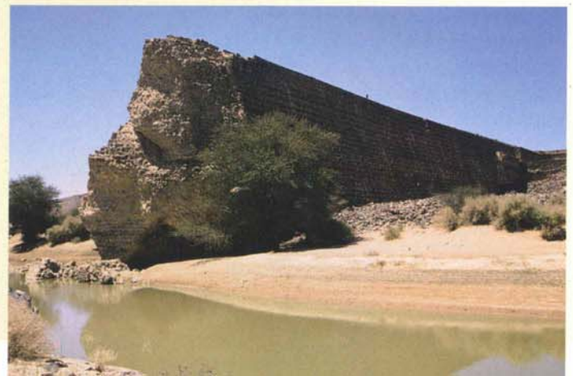
This leaves Islamic hydraulic technology largely a *terra incognita* in the West. Despite the existence of books and sources on the subject in Arabic and Spanish, only a handful have appeared in English and French. Miraculously, a number of key tracts by Arab scholars from the sixth to the 12th centuries that were translated into Latin survived the destruction of Islamic texts and libraries during the Spanish Inquisition. A number of these documents now belong to the Biblioteca Nacional in Madrid.

In one pivotal Spanish-language manuscript, the 16th-century *Libro di Agricultura*, author Gabriel Alonso Herrera passes on essential Arab knowledge about farming and irrigation in Spain. Books by al-Jazari and other medieval Islamic inventors are preserved in the Topkapı Library in Istanbul.

Scholars speculate that there may be further undiscovered knowledge of Muslim technology in general and hydraulic sciences in particular among the thousands of Arabic manuscripts lying untranslated and often uncatalogued in European and North American libraries. Before his death in 1994, Hill advised researchers to probe more deeply into historical material from Spain, Sicily, Syria and Byzantium to better trace the transmission of technologies from Islamic societies to the West.

After half a millennium or more, many proudly engineered feats from Spain to Iran and Oman are in various stages of repair. Some, like Granada's Alhambra, constructed in the 13th and 14th centuries, are splendidly preserved; others are in ruins.

Threaded by gravity-fed canals supplied by a reservoir of water raised from the Darro River, the Alhambra's gardens, called the Generalife, are without peer, embodying the Islamic visionary ideal of technology and aesthetics at its apex. The gardens' ornamental pools (*birka* in Arabic), basins and fountains are surrounded by stately cypresses and flowering tropical plants, all impeccably maintained for the 2.5 million visitors





# THE TOOLS OF MUSLIM WATER TECHNOLOGY

## THE SHADUF

One of the oldest known tools used to raise water from a well, river or lake is the *shaduf*. This simple mechanism, used since pharaonic and classical times, consists of a bucket attached to a rope at the long end of a wooden pole. The pole rests on a fulcrum with a counterweight at the short end of the pole. When an operator pulls down the long end of the pole, he lowers the bucket into the source, and the counterweight hauls the full pail back up to the surface. Shadufs were introduced in Spain in the sixth century of our era, but not until the 14th century did they spread north to Germany. They also were adopted in Flanders (in present-day Belgium), where the 16th-century artist Pieter Bruegel the Elder depicted them in engravings of Flemish farms. Although they have largely disappeared from northern Europe, shadufs remain widespread throughout the Middle East, notably along the Nile.

## ARCHIMEDES SCREW

This classical device, named for the third-century BC Greek mathematician who first documented it, is composed of a wooden screw mounted inside an inclined cylinder. As the screw is turned, the spiral thread lifts the water into a sluice. Writing around 20 BC, the Greek historian Strabo described just such an Archimedes screw raising water from the Nile.

## THE NORIA

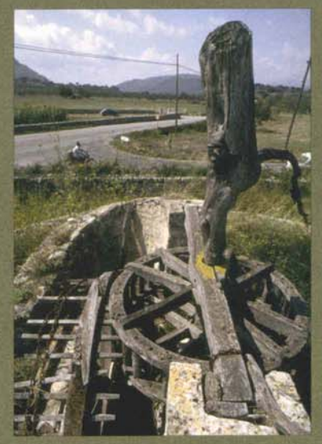
Rotated by water-power, *noria* waterwheels, such as the Albolafia in Córdoba, turned first in Iran, where al-Muqaddasi described numerous norias along the Ahwaz River around the year 1000. Later, the noria became a mainstay of irrigation throughout al-Andalus. Still today in Syria, the city of Hama's 20-meter-diameter (64') wheel, equipped with 120 compartments that empty into a stone aqueduct, lingers as a nostalgic landmark alongside the Orontes River. Writing in 1154, the geographer al-Idrisi marveled over an Andalusian noria twice that size that lifted water from the Tagus River to Talavera de la Reina near Toledo.

## THE QANAT

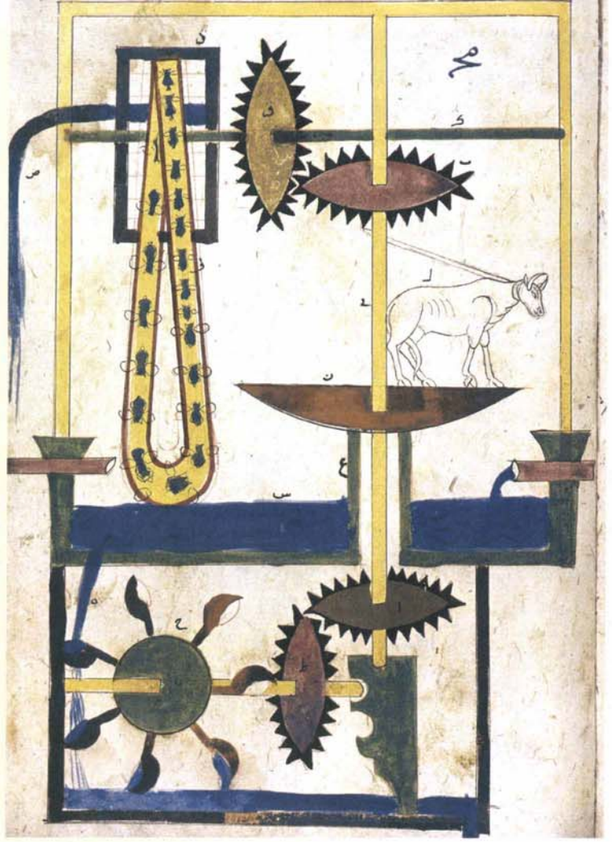
One of the most basic methods of controlling and moving water is the canal. When constructed above ground level, a canal is called an aqueduct; when buried below ground level, it may be called a *qanat* (in Iran), a *falaj* (in Oman), *foggara* (in the Sahara regions) or *khettara* (in Morocco). The oldest qanat may be one uncovered by the 2003 earthquake in Bam, Iran, that dates back more than 2000 years.

## THE SAQIYA

Originating in Persia around the same time as the qanat, the *saqiya* is an animal-powered mechanism of interlocking wooden gears, usually two, set at right angles to each other. A donkey or mule is harnessed to a pole fixed to the broad, horizontal wheel, which is set with posts generally less than a meter tall—the teeth of that gear. These posts mesh at right angles with thick pins set into a vertical waterwheel, the second gear. Attached around the circumference of the vertical wheel are clay pots. When the animal walks in a circle, rotating the horizontal wheel, it rotates the vertical wheel, which dips the pots into the water one by one. As each pot reaches the top of its arc, its water pours into a wooden sluice. According to historian Ibn Bassal, the saqiya was the most widely used method of irrigation in the Muslim world by the 11th century.



PATRICIA BARBOR (2); OPPOSITE: SHADUF, SAQIYA, QANAT: TOR EIGELAND; ARCHIMEDES SCREW: SUSAN SHEARS; NORIA: NIK WHEELER.



**Though al-Jazari built this water-raising machine as a decorative and mystifying attraction—the machinery in the lower level was hidden from viewers and the cow was a wooden dummy—it was nonetheless an entirely practical design, one of more than 50 hydro-automata he devised. Powered either by a real cow or by the scoop-wheel in the lower level, the upper horizontal axle drove the yellow belt with its attached water-pots to lift water to the upper level.**

who stream through the site each year, making it, with the Alhambra, one of the most popular tourist sites in Europe.

South across the Mediterranean, in the midst of the Algerian Sahara, the red-clay oasis of Timimoun has evolved around a human-made wetland irrigated by *foggaras*, an eighth-century labyrinth of channels and storage chambers built 10 to 15 meters (32'–48') below ground to minimize evaporation—much like the qanats farther east. Thanks to this system, farmers to this day grow 100 varieties of date palms—600,000 trees total—across some 25,000 hectares (62,750 acres) of this flourishing oasis, which also produces carrots, onions, fruits and other crops. Similarly, in Morocco, in the eastern desert region of Tafilalt, the landscape is crisscrossed with long, low ridges of earth, looking as if gargantuan moles have been at work. This 300-kilometer (185-mi) web of underground irrigation channels, here called *khettaras*, was built in the 14th century to tap into the aquifers fed by springs in the High Atlas mountains.

In neighboring Tunisia, a mammoth pair of walled cisterns—the larger one the size of a football field and eight meters (26') deep—diverts water from the Wadi Marj al-Lil near Kairouan and transfers it into irrigation canals. According to Zaimeche, these constructions were originally credited to Phoenician or Roman builders, but were actually devised by Muslim engineers in the ninth century.

In Egypt, "nilometers" had been used since pharaonic times to measure the height of the Nile's annual flood, but the most scientifically accurate one was built around 870 by the astronomer Alfraganus; it was used to gauge river levels until modern days. Positioned on the southern tip of Rhoda (Rawdhah) Island near Cairo, it is a domed stone edifice sunk more than 10 meters (32') into the riverbank. Three tunnels, placed at varying heights, connect it to the river. As the river rose, the water also rose inside the structure, and its height was measured on a calibrated, 9.5-meter (30') column. Used to calculate taxes and reckon water distribution, this nilometer and its predecessors have left a nearly unbroken hydrological record dating back to the early seventh century.

Continuing east to central Iran, a series of brick domes and wind towers poke distinctively above the skyline of the city of Yazd, indicating the presence of subterranean reservoirs called *ab anbars*. Relatively late constructions of the Safavid and Qajar eras in the 18th century, these buried pools, some 10 meters (32') below surface level, keep water cool by means of vented towers that circulate in fresh air from the outside, both by capturing breezes and by natural convection over the cool water surface. Some of the grander ab anbars include public baths, shops and coffeehouses. Although there are between 75 and 90 surviving ab anbars in the Yazd region, most are in a precarious state, and a number are on the verge of collapse.

SCHOLARS SPECULATE THAT THERE MAY BE MUCH KNOWLEDGE OF EARLY MUSLIM TECHNOLOGY IN GENERAL—AND HYDRAULIC SCIENCES IN PARTICULAR—LYING UNDISCOVERED IN MANUSCRIPTS NOT YET CATALOGUED OR TRANSLATED.

South across the Strait of Hormuz, Oman's *aflaj* (singular: *falaj*) are man-made networks of canals, both underground and on the surface, similar to qanats and their kin. The aflaj have watered the riverless country for more than 2700 years. Today, they still deliver more than 70 percent of the nation's total water needs.

In contrast to these North African and Middle Eastern waterworks that have on occasion remained in use, in Spain many of the Andalusian waterworks were forsaken when the Arabs left, according to Thomas Glick, a historian of technology at Boston University. As Christians switched from widely varied Arab crops to the planting predominantly of vineyards and cereals, they required less water for irrigation, he explains.

PHOTOS12.COM / ORONOZ / TOPKAPI LIBRARY



Recently, as housing development and tourism have displaced agriculture, Spain's medieval water systems have suffered further deterioration. For instance, the extensive qanats, stone tunnels, canals and wells constructed in Majorca and Ibiza by Berber settlers, starting in the 10th century, have been largely abandoned or filled in with concrete, according to Helena Kirchner, a historian specializing in water technology at the Autonomous University of Barcelona. Rapidly rising tourist demand for water has lowered the water table, rendering many of the networks dependent upon electric pumps to bring water from lower depths, she explains.

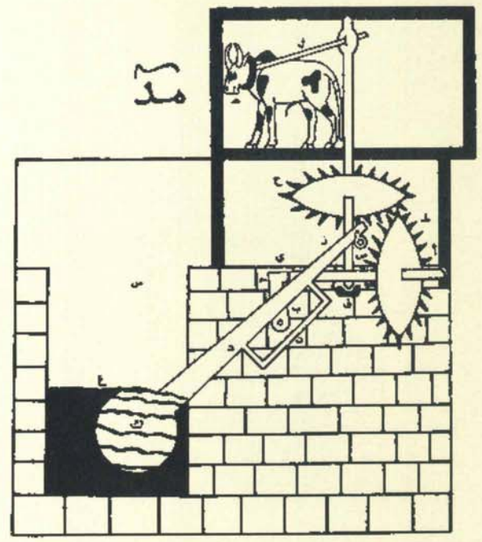
In Marrakech, El Faïz shows me around one of the most beautiful of North Africa's surviving waterworks, the Agdal Gardens. Here, the 12th-century Almohad sultans and successor dynasties received ambassadors and other dignitaries. The gardens' reflecting pool, the size of two football fields, is surrounded by swaying date palms and serried rows of orange and apple trees. From the walkway surrounding the pool, there's a glorious panorama south to the High Atlas mountains and north to the lower Jibelet foothills—both of which feed the city's canals, known here as khettara.

"The gardens demonstrated the sultans' mastery of water," El Faïz declares. "When one had water, one had power."

Beneath the approach ramp leading to the basin, he calls my attention to the metal gate that opens to let water flow by gravity into a web of small irrigation canals snaking through the fruit groves.

"The engineers calculated exactly the slope the canals needed to ensure that a precise amount of water reached each tree," he explains. "If a drop were released here, they knew where it would end up three kilometers [½ mi] away." Later, in the 16th century, the water was also used to power mills for pressing cane into sugar, then a luxury commodity that was exported as far away as London and Rome. Over the centuries, both the aboveground and underground canals, though they water the gardens to this day, have deteriorated, says El Faïz, and the walls of the reflecting pool are steadily eroding.

"If there's not some restoration soon, there's a risk the walls will give way, flooding the gardens with millions of liters of water and destroying them," he warns. And in a city like Marrakech, where a population explosion, along with a development boom in luxury villas and water-guzzling golf courses, is gobbling up sparse greenery and parkland, the loss of the Agdal Gardens would be nothing short of an ecological disaster.



**With this design, here sketched schematically after an original in the collection of the Topkapı Library in Istanbul, historians Donald Hill and Ahmad Hassan credit al-Jazari with the first known use of a mechanical crank. Animal power turns the large meshed gears, and the horizontal axle turns a crank whose rotation alternately pushes up a channeled, flume-beam swape and allows it to fall. In its lower position, the swape's scoop submerges to be filled; the shift in the crank's position raises the swape up out of the water and tilts it so the water runs down the flume-beam and pours into a cistern or irrigation canal. The sketch exaggerates the angle through which the swape is raised.**

Although Islamic science is generally underrepresented in museums in the West, there is one standout exception: Granada's Science Museum, which is constructing a major new wing dedicated to Arab contributions to world knowledge. Meanwhile, its smaller permanent exhibit, "Al-Andalus and Science," offers one of the few introductions to Islamic hydraulics and agricultural innovation. (Another is at the Frankfurt Institute for the History of Arabic-Islamic Science.)

Alongside a model of a noria and miniature paintings of gardens is a bumper crop of exotic foods and commodities imported from Islamic countries to al-Andalus, including sugarcane, cotton, rice, artichokes, eggplants (aubergines), spinach, citrus fruits, date palms and bananas. Such a cornucopia required highly organized irrigation to deliver a year-round water supply, one that employed qanats, *minas* (which resemble qanats, but without ventilating shafts) *cimbras* (ditches covered with slate slabs) and the man-made storage ponds called *albercas*, among other constructions.

One of the most mesmerizing exhibits is a small Plexiglas model of one of al-Jazari's water-raising devices: a contraption with a paddle wheel activated by flowing water. The wheel turns meshing gears which rotate an axle that turns a vertical chain of buckets that pour water into an elevated courtyard fountain. Hill speculated that this whimsical fantasy was intended as a decorative lakeside attraction "with an element of mystification about it." In the 13th century, a modified, full-sized version was erected on the Yazid River in Damascus; it raised water 12 meters (38') and directed it to a nearby hospital. The apparatus was used until 1960.

This is one of more than 50 water-raising machines, water clocks and other labor-saving hydro-automata that al-Jazari, among the most versatile inventors in the history of Arab science, presents in *Al-Jami' Bayn al-'Ilm w' al-'Amal al-Nafi' fi Sana'at al-Hiyal (A Compendium on The Theory*

**Flowing toward Granada from the spring in the village of Alfucar in the foothills of the Sierra Nevada, an *acequia* first built in the 13th century still flows today.** Below: **This larger acequia once helped bring water to the gardens of the Alhambra.**

*and Practice of the Mechanical Arts*, also called *The Book of Knowledge of Ingenious Mechanical Devices)*. His compendium includes colorful, minutely detailed illustrations. His designs for segmental gears, cranks, slot rods that convert rotary to reciprocating motion and suction pumps—some with double-acting, horizontally opposed pistons—all appeared some three centuries before they came up in the writings of Italian engineers.

Hill's assessment of al-Jazari is categorical: "It is impossible to overemphasize the importance of al-Jazari's work in the history of engineering."

AFTER THE 15TH CENTURY, ARAB-INSPIRED WATER-MANAGEMENT TECHNIQUES WERE ADOPTED AS FAR AWAY AS THE CANARY ISLANDS, MEXICO, TEXAS AND LOUISIANA.

Yet like any genius, al-Jazari had his predecessors: Nearly four centuries earlier, in ninth-century Baghdad, the Banu Musa—the brothers Mohammed, Ahmed and al-Hassan, sons of Musa bin Shakir—drew on the work of their own Hellenistic predecessors Philon and Heron to devise fountains and trick vessels that replenished themselves using a variety of valves, siphons and floats. In the *Kitab al-Hiyyal (Book of Ingenious Artifices)*, written around 830, the brothers conjure up more than 90 machines, some of which use convoluted, double-concentric siphons that create airlocks to regulate water flow.

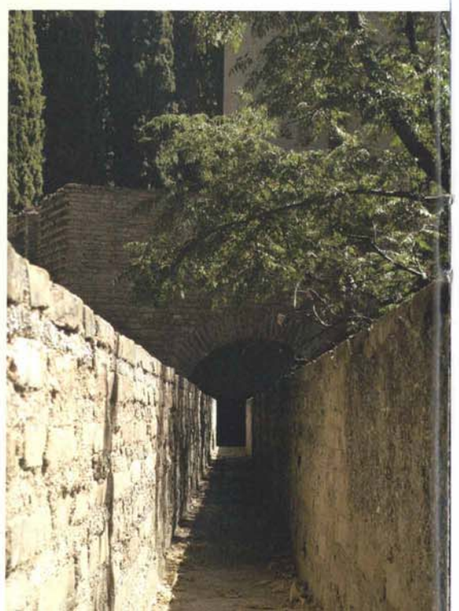
In 16th-century Damascus, the polymath judge Taqi al-Din penned some 19 books on physics and hydraulics, including the intriguingly titled *Al-Turuq al-Saniyya fi al-Alat al-Ruhaniyya (Sublime Methods of Spiritual Machines)*, an illustrated catalog written around 1551 that describes clocks, pumps, load-lifting equipment and other contrivances, including a water-powered six-cylinder "monobloc" pump. Its scoop paddle-wheel turns an axle that sets cams and piston rods in motion, drawing water through a series of valves and accelerating it with great force into a delivery pipe. In the West, ironically, Agostino Ramelli, Italian physicist and author of the 1588 tome *Le diverse et artificiose machine*, received credit for devices Taqi al-Din had published 37 years earlier.

After exploring the hydraulic machines at Granada's Science Museum, I drive across town to the city's Nasrid-era Albaicín quarter to meet Carlos Vílchez, director of Granada's Museum of Archaeology and Ethnology and the author of a handsome volume detailing the city's cisterns, wells, tunnels and waterworks. Eight hundred years ago, in this warren of densely packed, whitewashed houses in the heart of the old city, some 30,000 Spanish Muslims enjoyed running water, an efficient sewage system and 28 large, interconnected cisterns fed by shallow channels that brought spring water from a pool 12 kilometers (7½ mi) away in the foothills. Although these 13th-century *aljibes* were abandoned in the 1950's with the introduction of a piped domestic water supply, the remote spring still functions as an auxiliary source of water for the city.

"Actually, the water from the spring tastes sweeter than the main supply from the Sierra Nevada mountains," says Vílchez with a grin, when I meet him on Calle del Agua (Water Street) for a tour of the city's medieval cisterns. Accompanied by Gracía Lopez of El Legado Andalusí, an influential cultural organization dedicated to spreading awareness of the Arab heritage in Spain, Vílchez leads me up the narrow, shop-lined lane, pausing periodically to inspect circular paving stones the size of saucers.

"See the holes and grooves?" he asks. "Those held the small ceramic sluice gates, the *partidors* that diverted water into individual houses and shops." Beneath our feet is a maze of arched stone tunnels that channeled the spring water to various cisterns. Zigging and zagging past crowded markets that remind me of the *suq*s in Fez and Marrakech, we emerge into a quiet, sun-drenched square with a large niche in one wall where the residents lowered their buckets into the cistern to draw up water.

"This is the famous Aljibe del Gitane, the gypsy cistern, the one Federico García Lorca wrote about in 'Romance Sonámbulo,'" says Vílchez reverently, as he launches without further ado into an impromptu recitation from the poem by Granada's illustrious son:



TOR EIGELAND; OPPOSITE, TOP: RICHARD COVINGTON; LOWER: DICK DOUGHTY

**Much resembling its counterparts in Spain, a narrow irrigation channel meanders through a grove in Oman. Some of Oman's *aflaj* and other waterworks date back 2700 years; nationwide, such systems still deliver some 70 percent of the country's water.**

Over the mouth of the cistern
The gypsy girl was swinging,
Green flesh, her hair green,
With eyes of cold silver.

Winding our way past the quarter's well-preserved Moorish baths, Vílchez explains that updated archeological research has overturned the mistaken notion that the Muslims built baths, canals and aqueducts in Granada on Roman foundations.

"Their works were completely separate, erected in different locales," he asserts. "Even the source of the water was directed into town from another village than the one the Romans used."

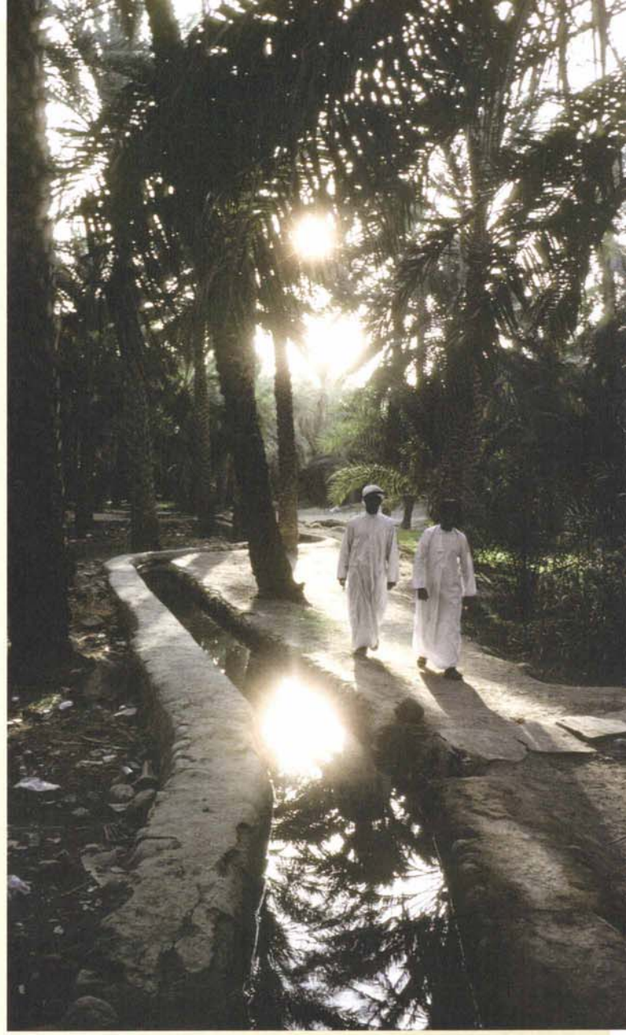
Outside the 11th-century western wall of the Albaicín, we enter the Aljibe del Rey, the royal cistern, a recently renovated compound of courtyards, gardens and fountains above what is, hands-down, the largest aljibe in the city and, no doubt, one of the most impressive in the world. Carefully descending a shaky ladder into the empty cavern, we encounter a cool, echoing interior of lime-covered brick, 25 meters (80') square and four meters (13') high, a reservoir capable of storing some 300,000 liters (72,000 gal) of water. Originally, when the aljibe was constructed for the Nasrid Dynasty around the 13th century, it was open to the sky. Now it is covered by a vaulted roof supported by thick pillars and dotted with round and square holes that cast shafts of light into the shadowy recesses. Peering up near the roofline, I can see the small rectangular opening where residents used to gather to lower their buckets.

Back outside, as our eyes gradually adjust to the blazing sunlight, we climb into Vílchez's car to have a look at La Fuente Grande, the big spring, the main source of water that once fed all of Granada's aljibes, and that is now diverted into the city's main reservoir. As the road climbs east past olive groves, we turn into a regional nature preserve, the Parque de Sierra del Huétor. We stop briefly to admire the *acequias*, the slender aqueducts that meander downhill into Granada.

"The 13th-century engineers were incredibly accurate surveyors," marvels Vílchez, "able to incline these canals so that the water moved neither too fast, which would cause overflowing, nor too slowly, which would make it stagnate." Although the distance to town is 12 kilometers (7½ mi), the canals cross farmlands and olive groves, so their actual length is close to three times as long, he says. Farmers in Valencia province to the north and also in the Alpujarras mountains south of Granada still use open-air, Islamic acequias for irrigation, Vílchez remarks.

It is at the village of Alfucar, surrounded by lofty pine trees and scrub brush, that the spring itself bubbles forth into a tear-shaped pool of invitingly pellucid water, vivid green lichens waving in the bottom. Sweeping an arm toward the scree-covered hills above us, Vílchez explains that rainwater filters into the aquifer from the mountains and surges up in a continuous flowing volume that to the Muslim settlers, accustomed to drier climes, appeared nothing short of miraculous.

"The Berbers and Arabs were absolutely astonished at the amount of water available here," he muses, gazing across at the parched landscape. "So they took advantage of the abundance." ⊕



Paris-based author **Richard Covington** writes about culture, history and science for *Smithsonian*, *The International Herald Tribune*, *U.S. News & World Report* and the London *Sunday Times*. His e-mail is richardpeacecovington@yahoo.com.

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*Aflaj* in Oman: N/D 72
Water in Al-Andalus: S/O 91

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# The Last Nile Flood

Written and Photographed by John Feeney

Flowing out of a barren desert, from a source "beyond all known horizons," the Nile had baffled the world for thousands of years. Regular as sun and moon, in the middle of burning summer, without a drop of rain in sight, when all other rivers on earth were drying up, for no apparent reason at all, the Nile rose out of its bed every year, and for three months embraced all of Egypt.

The Colossi of Memnon, 3400-year-old statues of Amenhotep III, stand reflected in Nile floodwaters during the summer of 1964.

The ancient Egyptians knew when the flood would come, almost to the hour, but they never knew how much water it would bring to irrigate their fields. Egypt's prosperity depended not only on the flood but also upon the accurate measurement of its height, for on that depended the allotment of water to its many users and the taxes they would have to pay in the coming year. "Nilometers" built into the river's banks to measure the flood had, for 4000 years, decreed how much water would be available to irrigate each man's field. The oldest measuring devices were at Memphis and Dendera, and at Aswan, in Upper Egypt, but the most important one was in a secluded grove of orange and lemon trees on the Isle of Rhoda, or Rawdhah, close to Cairo. Rebuilt by the Fatimids in the year 870, a deep stone-lined pit went down below the surface of the river to where three tunnels, at different levels, led water in and where the flooding river's daily height was measured against a central stone column. (See page 17.)

In the Middle Ages, each day during flood-time, the town crier walked the streets of Cairo announcing to the city the height of the rising Nile, although in drier years the actual height might be kept secret for fear of causing financial panic. "Twelve cubits today and the Lord is bountiful. God hath given abundance and watered the high fields," he would say, to which a boy accompanying the crier would reply in his high-pitched voice, "Bless ye Muhammad."

The people's happiness or misery depended upon the annual flood—yet sometimes, the flood failed to come entirely. Written upon a rock on an island in the Nile at Aswan is this lamentation:

For seven years the Nile has not risen.
The fields are dry, no man buries his neighbor....
Children weep.... All Egypt perishes.

What was it that prevented the ancient Egyptians from finding the source of their great stream and perhaps learning how high it would flood in any given year? In its waters the Nile held many secrets. Fierce roaring cataracts, six series of them in a thousand kilometers (600 mi), guarded the river's upstream reaches, and neither the pharaohs nor the power of Rome could conquer all the cataracts. And beyond the cataracts, deep within southern Sudan, lay "The Land of the Swamps," a wilderness of trackless reeds that, even in the 19th century, marked the end of the known world. For hundreds of years, no one who followed the Nile into this swamp ever returned.

The Nile's source was only revealed a little more than a hundred years ago. In the heart of Africa, European explorers discovered a vast chain of equatorial lakes. And rising to nearly 5000 meters (16,000') above these immense lakes, on the equator between Uganda and the Congo but nonetheless capped with snow, were mountains known as the Ruwenzoris, often identified with Ptolemy's "Mountains of the Moon." Around their silent peaks they clasp the frozen vapors of distant oceans. Earth's greatest single stream, the White Nile, begins upon them. But this was not the complete answer. Why did the river rise so mysteriously every summer to flood Egypt?

Away to the east, as impenetrable to outsiders as the swamps, wild as the cataracts, Ethiopia towers above the deserts of Egypt and Sudan. And it was Ethiopia that held the ultimate secret, for here there was another Nile, the Blue Nile, more distant and mightier than even the White.

Forty-two years ago, in June 1964, I and my four-man Egyptian film crew set out from Cairo to capture on film the very last Nile flood that would come to Egypt. From the moment the flood began in Ethiopia, we followed its progress for 3200 kilometers (2000 mi). This had never been done before, and the CinemaScope feature documentary we produced, "Fountains of the Sun," became the only filmed record ever made of this momentous event.

**Inscribed on a rock on the island of Seheil, in the Nile at Aswan, is an account carved in hieroglyphics of a drought during the reign of Djoser in the 27th century BC. It was written some 2500 years later by scribes of Ptolemy V. In Miriam Lichtheim's translation, it begins:**
***I was in mourning on my throne,***
***Those of the palace were in grief,***
***My heart was in great affliction,***
***Because [the Nile] had failed to come in time***
***In a period of seven years.***
***Grain was scant,***
***Kernels were dried up,***
***Scarce was every kind of food....***
***Everyone was in distress.***



We left an Egypt blistering in the summer sun, every city, town and village anxiously awaiting the last flood of all. In the sultry heat of Aswan, thousands of sweating workers toiled day and night, hurrying to complete six giant tunnels in time to carry the coming flood safely past the unfinished Aswan High Dam. The dam was being built to create a vast inland sea that would capture every future Nile flood. Instead of the river irrigating the land once a year, Nile water stored behind the new dam would irrigate Egypt all year round, and produce electricity into the bargain. Yet for all the wonders of technology the dam represented in 1964, the age-old question remained: Would there be too much water? Too little? Or just the right amount? All Egypt waited.

Much of Ethiopia is some 2000 meters (6400') above sea level, and its thin air can cause your heart to race, until you get used to it. From Addis Ababa, Ethiopia's capital, we made our way in a four-wheel-drive truck up and down steep, Italian-built mountain roads toward the central high plateau. The summer winds of Africa had begun blowing in masses of storm clouds laden with moisture from the South Atlantic. They curled menacingly around gigantic mountain ridges. Millions of years of rain clouds had ground down these mountains into strange shapes.

To capture this cloud spectacle, we began filming in time-lapse. Instead of a normal 24 frames per second, we reduced the camera speed to just one or two frames per second so that, when projected at normal speed, the power and wrath of the swirling clouds was visually enhanced.

A week later, the sky over these strange mountains darkened further. Endless peals of thunder and immense flashes of sheet lightning accompanied the commotion in the sky. Nowhere else on earth does lightning flash and thunder roar so constantly as in the highlands of Ethiopia. Vicious streaks of forked lightning began to endanger man and beast alike: Every year hundreds of people die here from lightning. One day, near where we stood, a family's straw hut caught fire and quickly burned to ashes. Now I knew why the very young children we met on our journey had small wreaths of leaves tied around their wrists and ankles, and older children had small leather pouches tied around their necks: They were amulets for their protection.

We did not have long to wait before "the big rains," as the Ethiopians call them, streamed out of the sky. Each time we attempted to film the deluge, we had quickly to hoist a large umbrella before we could get out our camera and CinemaScope lenses, hurriedly swathing them in sheets of plastic, as we ourselves huddled under another umbrella. Often there was no time for a tripod, and the camera rested on a shoulder or a head.

**Far to the south, Ethiopia towers above the deserts of Sudan and Egypt, and storm clouds curl menacingly around mountains.**

During the big rains, it is the custom in Addis Ababa to hold concerts that go on into the wee hours of the morning. In a large shed, with the descending torrents beating an endless tattoo on the corrugated metal roof, we filmed a sequence of Ethiopian jazz music played by the Emperor's Army band, their trombones and trumpets raised toward the sky as if to symbolically catch the pouring rain. We later cut these musical antics in with the lightning, thunder and torrents pouring out of the heavens.

For three weeks on end, we worked in the drenching rain, driving across mountain plateaus, heading upriver further still to the source of the Blue Nile, passing boys of 10 or 12 sheltering from the rain beneath small, straw-peaked tents mounted on their head and shoulders, watching their herds of cattle, cows and goats. What tales, I thought, these young ones must conjure up as they watch their flocks in the rain. We stopped at the town of Bahardar, where we heard radio voices talking in Amharic and English reporting rising water levels that we knew were being transmitted also to anxious hydraulic engineers waiting in distant Egypt.

# Fountains of the Sun

"Fountains of the Sun" was produced as an 83-minute feature film that showed briefly in several Cairo theaters. It then fell into obscurity because of disputes over distribution rights. In 2001, it was nominated for inclusion in the "Memory of the World" register of the United Nations Educational, Scientific and Cultural Organization (UNESCO), which regarded it as "one of the most important films about the River Nile, ...showing for the first time on the screen the sources and wonders of the White and Blue Niles." The author hopes that a re-release may be possible in the near future.

**The author, second from left, with his film crew in the foothills of the Ruwenzoris, or "Mountains of the Moon."**

We reached the Debri Sinai Pass late at night during a break in the weather, and we decided to rise early next morning to get the sun rising in time-lapse out of nearby mountain peaks—the same sun that had lifted up these masses of water from the South Atlantic and sent them crashing against these Ethiopian peaks. It rose eerily and swiftly out of the dawn mists, serving in the film as a prelude to images of the mighty Tisisat Falls, "the fountains of the sun."

With a name that means "roaring fire," the Tisisat Falls must be one of the loneliest places on earth, little known and rarely seen by outsiders. Until the mid-20th century, they could only be reached by mule. Now a road got us to within a kilometer or so. Proceeding on foot through the rain forest, each person carried a piece of camera equipment. We first heard the murmur and then the roar as we got our first glimpse through the trees.

Then we stood transfixed before the answer to the riddle that had baffled the world for thousands of years. There before us, pouring forth with the sound of thunder in one colossal fuming torrent, the Blue Nile was anything but blue, plunging from its source in Lake Tana above, down into a deep dark abyss that was the beginning of its great journey to Egypt.

A boy of about nine summers appeared out of the bush and offered to hold the umbrella over the camera to protect it from clouds of spray floating off the falls. When we had finished our filming, we rested on the damp grass until our reverie was broken by a procession of six men

"A great river flows from sky to sky, eternally, from ocean to ocean."
—*The Fountains of the Sun*

From Lake Tana over Tisisat ("Roaring Fire") Falls, the Blue Nile pours toward Egypt the waters of countless South Atlantic spring storms. Above: **Lake Tana residents paddle canoes; riding in front, a boy plays the flute.** Opposite: **Members of the film crew watch storm clouds reflected in Lake Tana.**

**The flood of 1964 proved to be the greatest of the 20th century, and at Aswan, it surged north after passing through the sluice-gates of the old dam.**

emerging out of the bush, each carrying a stout stick over his shoulder, all guiding a solitary cow. A thief had stolen her, they said, and they were returning to their village from the local police station.

By August, the most colossal Nile flood of the century was pouring out of Ethiopia. We followed the surge as it moved like a slow-motion tidal wave across the deserts of eastern and northern Sudan, into Egypt.

"The canals are overflowing.
Praise be to Him who has given Egypt this great stream."
—Coptic prayer

Early in the morning we ascended out of Cairo aboard an Egyptian Air Force helicopter, and we aimed our lenses down on the surrounding splendor of Egypt's last Nile flood. A vast sea lay beneath us. How amazed pharaonic Egypt would have been to have observed the flood from our exalted altitude, the realm of Horus, "whose left eye is the moon, whose right eye is the sun."

From above the town of Suhag, in Upper Egypt, we sighted a traditional scene that has never been repeated since. Below us, a group of villagers was following the creeping floodwater down a dry, earth-cracked canal. When we landed, we joined two men on horses, 10 on donkeys and some 20 children all singing and shouting, beating small drums, expressing sheer joy as they accompanied the creeping water. It reminded me of an Upper Egyptian chant:

O flood newly coming,
Take from us our bitter pain!
Thou wilt be good and dear to us in thy coming,
And the day we see thee will be a happy one.

Children splashed their bare feet in the water. Elders waded in their shoes, "to get the blessing of the Nile." Soon they would be sailing in boats to visit friends, as each village became an island; with no work possible in the fields, it would be the time for weddings. At another site, as the water rose and became stronger, babies a few months old, held by their tiny wrists, were being dunked, three times, in and out of the rushing water, and then handed back dripping to their delighted mothers. This was how it had been, every summer, during thousands of years of Nile floods.

"I shall make (the Nile) gush for you... / Gone will be the hunger years."
(from the "Famine Stelae," trans. Miriam Lichtheim)

Next morning we ascended in the helicopter again, out of Luxor this time, and we circled over the flooding Nile basins, or lakes. Some of these were several miles long and they took a week to fill to a depth of two meters (6½'). We landed beside one still filling, and filmed. In each basin the water stayed for some weeks, drenching the land, slowly depositing the precious brown volcanic sediment it had brought down from the Ethiopian mountains. The water was then slowly led into another large basin, and so on until the remaining water flowed back into the Nile.

**In the Nile Delta, villagers welcomed the flood by cutting one of the earthen dams that conserved water during the winter months. Within a few hours, no trace of it was left.** Left: **With fieldwork impossible during the flood, a modern tapestry from Haraniya shows how the season was popular for weddings and visiting.**

In the soft sediment left by the floodwaters, the *fellaheen*, the farmers of Egypt, set about planting their crops of beans, wheat and barley as they had done for thousands of years. But after this year, all would change.

The Nile flood still comes, of course, but no one in Egypt sees it. Instead, it is contained in the immense inland sea called Lake Nasser, behind the Aswan High Dam. Here, Nile water collected year by year is led along neat narrow canals as unobtrusively as water coming out of a bathroom tap.

But in 1964, the oldest problem of all remained: No one could tell exactly when the flood would reach its peak. For three weeks at the height of this particularly vast flood, it was touch-and-go whether Cairo and large parts of Egypt that were normally not flooded could be saved from catastrophe. Hydraulic engineers stationed along the river in Sudan and Egypt worked day and night to try to control the surging waters. The flood reached to within a few inches of the top of the six tunnels meant to lead the flood safely past the unfinished High Dam. Ramses II's 3500-year-old temple at

Above: **Throughout the Nile Valley, villages became islands.**
Right: **An aerial view of the flooding Nile near Qena.**

Abu Simbel, in the process of being moved to higher ground, was threatened. Basements in Cairo filled with water. Perimeters of concrete were hurriedly built around sewage and telephone conduits. Immense sheets of water began flowing up out of cracks in even the paved streets. This last Nile flood was a reminder that the river could still bring both life and death. Then, a few inches short of disaster, the river ceased its rise.

"The river having reached its anxiously awaited peak, preparations were made for the annual 'Procession to the Nile.'"

In 1047, the visiting Persian scholar Nasir Khosrau left a particularly rich description of the annual Fatimid procession celebrating the Nile's inundation of Egypt. For this great occasion, he wrote, the caliph went personally to his treasury to select his symbolic regalia: parasol, turban, scepter and sword. The sound of the palace band, which would accompany the procession, was so enormous that for three days before the event, massed drums and trumpets played continuously in the palace stables to accustom the animals to the noise. The job of decking out the processional route fell to the jewelers and tailors of the city, and this, too, always took three days and nights to arrange.

When the Nile reached its peak, the golden parasol was unfurled, trumpets sounded, and the caliph, "mounted and clothed in sapphires and emeralds," emerged to the wonderment of his subjects.



Khosrau left a particularly rich description of the Fatimid procession celebrating the flood.

Amidst clouds of incense, the procession of 10,000 men on horses moved off toward the great gate of Bab Zuwaylah, and beyond it to the flooding Nile.

From the surrounding rooftops, joining the din of drums, clashing cymbals and trumpets, "which sounded like thunder," came choruses of the women's ululations, "made by holding one hand under the nose and waggling the tongue in mid-scream."

Leading the great procession were the sons and soldiers of the caliph's princes (*amirs*). Then came the "amirs of the silver rods," their symbols of office hung with little silver bells that jingled as they marched. Next came the "amirs of the collar," two bearers of "the standards of praise," and bearers of the symbolic inkstand and sword. Next came the mounted caliph surrounded by "men of the stirrup," two at his horse's bit, two at the neck, two at the stirrups, with the "commander of commanders" holding the caliph's whip. The bearer of the golden parasol "took care to keep the caliph shaded from the sun," while strategically placed in front of the caliph's horse were two designated fly-swatters.

Amidst such a vast assembly of courtiers and crowd, it was difficult for many spectators to catch even a brief glimpse of the passing caliph. But the very act of seeing him, it was believed, conveyed blessings upon the beholder.

On reaching the Isle of Rhoda, the caliph dismounted, and the ceremony of anointing the Nilometer began. A mixture of saffron and mastic was handed to an official. Still in his clothes, he plunged into the floodwater and hung by his legs around the measuring column, dabbing on the perfumed mixture as readers above recited verses from the Qur'an.

The caliph went on to attend the opening of the "Canal of Egypt" (Al-Khalij al-Misri), which was kept dammed with stagnant water during the river's winter months. At the canal, one of the caliph's most magnificent silk tents was ready to give him protection from the summer sun. (Fatimid tents, transported on the backs of many camels, were portable palaces that took seven to nine years to make.) Amid more trumpet fanfares, the caliph thrust a spade onto the winter earthen dam and at once diggers attacked the dam with their hoes, cutting a series of narrow trenches across its surface. The impatient floodwaters quickly took over, eroding deeper channels, washing the dam completely away, and within an hour the life-giving flood reached the heart of all Cairo.

This annual spectacle was the most important event of the Egyptian year in the Middle Ages and well into the 19th century, as were similar ceremonies during pharaonic times.

The narration of "Fountains of the Sun" closed with these words:

*"The waters of the Nile have known Aristotle and Alexander, Anthony and Cleopatra and great Caesar, Joseph and Moses found beside the river, and the Christ child brought into Egypt, Saladin and the Crusaders, Arab princes and the pharaohs of ancient Egypt. All have drunk from this stream, for water is everlasting. Water cannot be created. Water cannot be destroyed. A great river flows from sky to sky, eternally, from ocean to ocean."*

New Zealand-born filmmaker, photographer and writer **John Feeeney** was among the early developers of wide-screen and large-format film techniques. He has contributed to this magazine since 1973. He divides his time between residences in Cairo and New Zealand.

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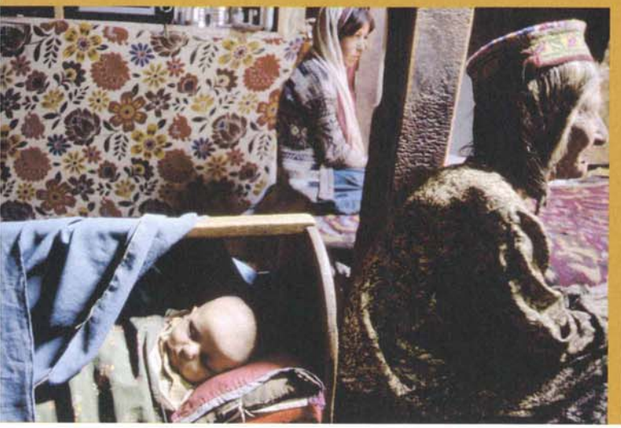
Nile ecology: N/D 87
Aswan: S/O 85
Nile Monuments: J/F 65

**For Further Reading:**

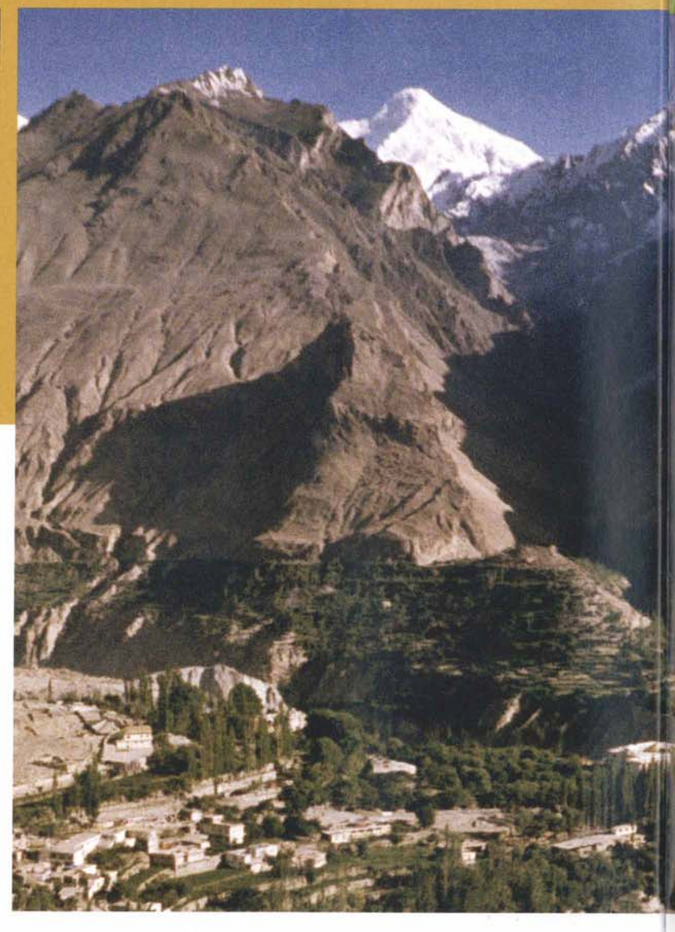
**Ancient Egyptian Literature: A Book of Readings, Volume III, The Late Period.** Miriam Lichtheim. 1980, University of California Press, 0-520040-20-1, $19.95 pb.

**The Aswan High Dam began to fill after the 1964 flood, and construction on it continued until its official inauguration in 1970.**

# COOKING IN HUNZA



Overlooked by the shining slopes of Rakaposhi, which rise nearly 6000 meters (19,200') from the valley floor, the apricot orchards and wheat fields of the Hunza Valley wind along the Hunza River. Opposite: Over less than a generation, Hunza foodways have adopted many imports that come via the Karakoram Highway that runs through the valley, connecting Islamabad to the south with China to the north.



*Written by Julie Flowerday*
*Recipes by Mareile Paley*
*Photographed by Matthieu Paley*

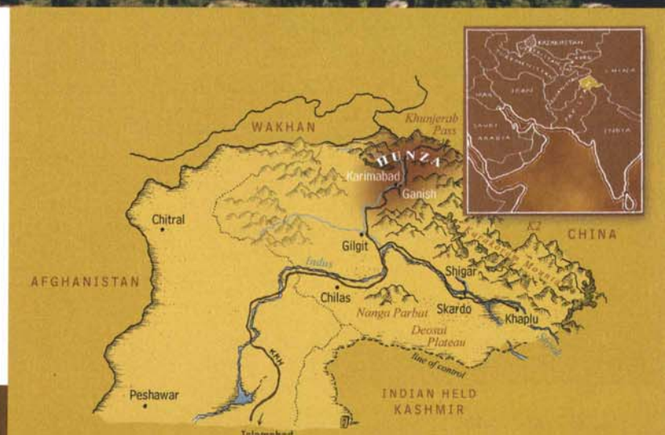
Taste has a strong effect on our sense of well-being and our social identity. Food informs us who we are, how well we are, and even how far we are from home. Few things are more intimately linked, more closely implicated, and more sweetly (or bitterly) sensed in our life's journey than food. Just how closely food resonates with other changes in a society is, therefore, an intriguing issue.

In northern Pakistan, in the high valley of Hunza, food practices have changed profoundly during the last 50 to 60 years. For decades, access to Hunza, in the heart of the Karakoram mountains (Western Himalayas), was quite difficult. But following its secession in 1947 from the maharajah's government of Jammu and Kashmir, Hunza shifted from an indentured agricultural economy, anchored by local hereditary rule (*mirdom*), to a state-driven national and global market economy. A benchmark of these changes was the completion in 1978 of the international Karakoram Highway. Traversing the valley, the highway became a thoroughfare between Islamabad and Beijing, and it opened Hunza to a variety of extraordinary changes. The changes in food and foodways reflect much of what happened and bring to view a new awareness of what "traditional" means.

It is actually something of an irony to document this cooking as "traditional" because most Hunza households are still making the dishes reproduced here. The difference is that older people knew a time before the construction of the Karakoram Highway when rice, chutneys, curries, processed sweets and other delectables were rare. Now they are commonplace in local bazaars, and younger people accept the various national and global products as ordinary. Yet with the opening of Hunza to outside influences, local women saw Pakistani foods privileged over their local dishes. They saw the time-honored fare that they offered as young brides relegated to sideshow events at community celebrations. They recognized that, as the new and tasty foods from beyond the valley became popular, part of their own identities was being diminished and marginalized as "traditional." Disappearing from view was the earlier context to which both the food and the women who cooked it belonged. If you were to read these recipes from the perspective of an elder Hunzakutz, you would know the time of year any dish was eaten, as well as its place in a disciplined sequence of annually consumed foods. You would also know folktales to go with different dishes, steeped in tradition, told and retold.

The disappearing context that cradled such stories also included the punishing labor of women's lives. They tended

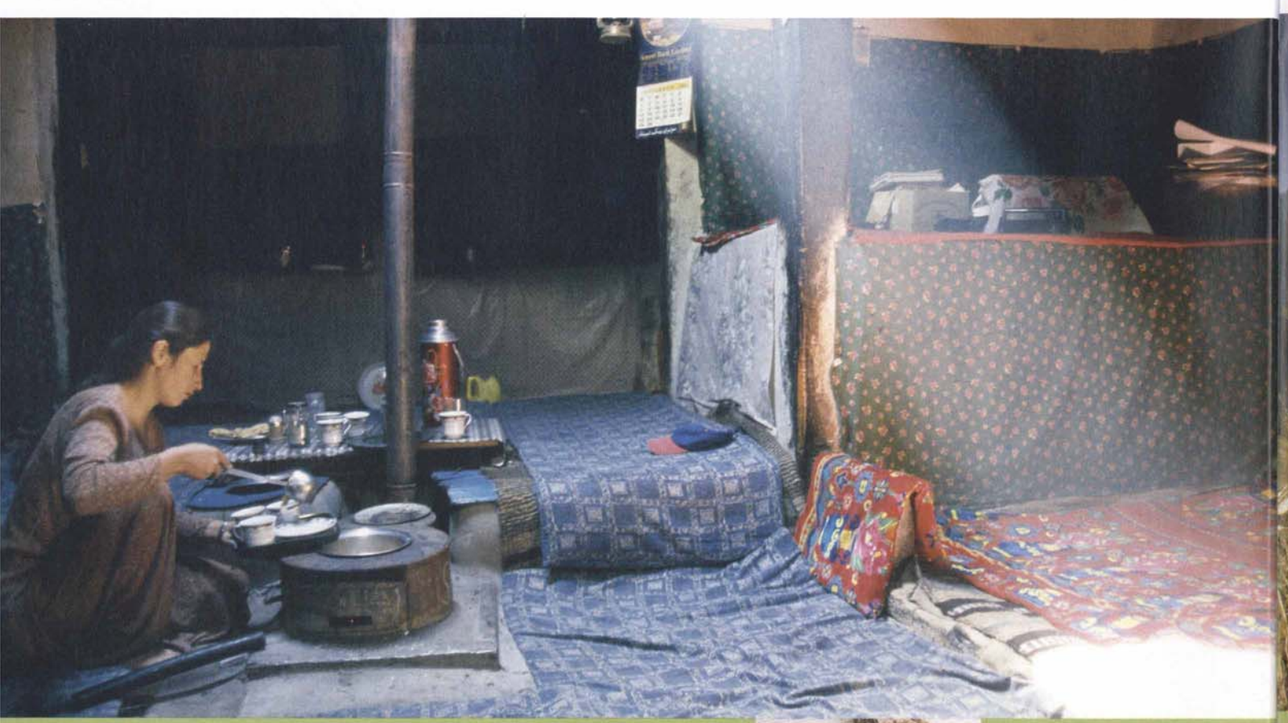
MAP: MARIELE PALEY



fields scattered up the mountainside, while at the same time raising babies and feeding their families. They carried loads on their backs that weakened their knees and stiffened their joints. They raced against time and shuddered at the tempests of rain and sandstorms, hoping to protect their perishable harvests. In their "free" time, they searched for salty-tasting earth and hauled it back home to enrich their cooking stock.

While preparing the dishes for this book, the women of Karimabad in the Hunza Valley lamented that their recipes could never taste the same as they had in the past. Salt sold in the bazaar, either granulated or as hunks of rock, had a different flavor than salt from local sources, they said. Flour formerly ground at a local water mill had a different texture than the flour now produced by an electric mill, and this was different again from flour imported from China. For the oldest, the *bokhari* (steel oven) had itself been an innovation, for they had learned to cook at the *shee* (hearth), using stone pots, when there was no *shuli* (stovepipe) to remove smoke from the single-room farmhouse. All of them knew the difference in taste between *phitti* (wild-yeast bread) buried to bake in hot ashes and phitti baked in an electric oven. All knew a time when there was only one cooked meal in a day—two, if they were lucky—and when a meal was a single dish sometimes eaten out of a common pot. They also knew that their simplicity and their manners sometimes embarrassed young people: Why offer the same glass of water to others when there were glasses enough for everyone, a younger person might ask—and yet elders remember when there was only one glass in the house and it was customary to offer that filled vessel to everyone present before raising it to one's own parched lips.

So it is that the "traditional" underlies life-shaping experiences. The Karimabad women thus added something of their life histories to the recipes we collected through their fierce labors of love, which have made generations of women and their fathers, husbands, brothers, sons and daughters happy and well-nourished. We, in collecting these recipes, and you, in recreating them, honor the cultural heritage of the unspoken heroes and heroines of Hunza.



**Rice does not grow at Hunza's altitude, but wheat thrives, and it provides the staple grain of Hunza cuisine.** Opposite: **A woman uses a wood-fueled stove inside her home in the town of Karimabad.**

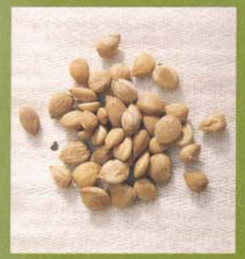
## INGREDIENTS

Wheat is Hunza's main staple food. Rice, otherwise so common in Asia, cannot be grown in the mountainous terrain and high-altitude climate, and so different breads and wheat-based dishes replace it. Other grains such as buckwheat and barley are also cultivated.

Maltash is "aged butter," prepared from milk that is scalded before churning. Its strong taste is so valued that maltash is a gift for births, weddings and funerals—taxes can even be paid in maltash. The older the maltash, the more valuable it is. Wrapped in birch bark and buried in the ground, it may lie for years or even decades before the head of the family decides it is time to dig it out.

Kurutz is a salty, sour, rock-hard cheese that is a favorite soup flavoring. It is made by boiling down lassi (see page 43), together with a piece of older kurutz that gets the enzymes started, as in sourdough bread. The resulting soft paste is pressed and sun-dried. Similar cheese is made from Mongolia to Tibet.

Dried apricots are a favorite snack and an ingredient for soups and juices. The valley is known for its abundance of apricots, most of which are collected in late summer to dry in the sun on rooftops, walls and boulders.



Apricot kernels are very similar to almonds in taste and used in much the same way, as a snack and for cooking. Children often crack the hard shell of the apricot pits with a stone to get to the delicious kernel.

Apricot oil is traditionally extracted from the kernels by hand, though machines are slowly replacing the hand-work. There's a sweet and a bitter apricot oil: The sweet is for cooking; the bitter is a beauty product for skin and hair.

Tumuro is a native wild thyme which is found in the mountains surrounding the valley. It is used fresh and dried.

Coriander is not native to Hunza, but it grows easily in the harsh climate, and it is a very popular herb to season soups and meat dishes.

Turmeric usually comes as a bright yellow powder and is also a favorite import. It is mainly used in small quantities to color soups and other dishes.

# THE RECIPES

The selections that follow have been chosen for ease of preparation in a western kitchen and for their adaptability to non-Hunza palates. Because the women of Hunza cook from heart and habit, measuring cups and scales don't exist in their kitchens, so use these guides casually. Unless otherwise specified, the recipes are for three to four people. Be creative, adapt, substitute—and enjoy the result!

## Appetizers

### BALOGANZE PITCHU

*Here is an easy tomato dip that can be eaten warm or cold, as a snack or as part of a meal.*

3–4 small tomatoes
1 large onion
1 small green fresh chile pepper
3 spring onions
3–4 garlic cloves
1 strand fresh coriander
1 tsp salt
20 ml (1½ Tbs) cooking oil
250 ml (1 cup) water

Chop the onion and the tomatoes into medium sized chunks. Cut the chile pepper in half, remove seeds and chop very fine. The spring onions, garlic and coriander leaves should also be chopped very fine. Mix the chopped tomatoes with the spring onions, garlic and coriander and salt in a bowl and set aside.

In an iron pan, heat the oil and fry the onion until transparent and starting to brown. Add the water and then the tomato mixture and simmer on low heat for at least 10 minutes. Add a few minutes cooking time if the sauce is too liquid or add more water if too thick.

Decorate with a few fresh coriander leaves. Eat with chappati (or any other flat bread).

### BURUTZ BERIKUTZ

Burutz *is similar to a fresh cream cheese or cottage cheese, and this cheese chappati is not unlike a Mexican* quesadilla.

250 gr (9 oz) *burutz*
2 spring onions
50 gr (≈2 oz) fresh coriander leaves
50 gr (≈2 oz) carrot greens or dill
50 gr (≈2 oz) mint leaves
salt to taste
100 ml (≈ ½ cup) lassi (optional)
apricot oil
8 chappatis

Make eight chappatis according to the basic chappati recipe (see page 40) and set aside.

To make the cheese filling, chop the onions and herbs very fine and mix together in a bowl. (Other herbs and spices could be used.) Add the burutz and salt and mix well. To get a more spreadable filling, mix in some lassi or yogurt.

Spread four chappatis with ¼ of the cheese mix each and cover with a second chappati on top. Generously brush top with apricot oil. Cut in slices for serving.

## Soup

### CHAPSAE DOUDO

*This meat soup is simple mountain fare that can be adapted to nearly any type of meat—and it takes care of old bread.*

30 ml (2 Tbs) cooking oil
1 big onion, chopped
pinch of turmeric
200 gr (7 oz) meat (mutton is traditional in Hunza)
1 tsp salt
750–800 ml (≈ 3½ cups) water
2 chappatis, sliced

In a saucepan, heat the oil and fry the chopped onions until they become transparent and start to brown. Add a pinch of turmeric. Cut the meat in small chunks and add it to the onions. Continue frying for about 5 minutes, stirring frequently until the meat is well browned.

Add salt and water and bring to a boil. Lower heat, cover and simmer for about 15 minutes until the meat is well cooked. Add sliced chappatis and cook for a few more minutes.



## Main Courses

### GIRGIR ALOO

*This brown lentil and potato dish will taste familiar to western palates.*

300 gr (1½ cups) brown lentils (washed)
2 medium sized onions, chopped
2–3 tomatoes, chopped
4 Tbs fresh coriander leaves (use more or less according to your taste)
1 Tbs red chile powder
1 tsp turmeric powder
1 tsp salt
3 fresh green chile peppers
3 big potatoes, peeled and cut into chunks
30 ml (2 Tbs) cooking oil

Cook the lentils in a pressure cooker in 250 ml (≈ 1 cup) of water for 20 minutes, or for 1 hour in a regular saucepan or pot. Drain them and set aside.

Fry the chopped onions in oil until slightly brown. Then add the chopped tomatoes, chopped coriander leaves, chile powder and turmeric. Cover with 250 ml (≈ 1 cup) of water and bring to boil. Boil for 5 minutes, then mix in the salt, fresh chiles (whole) and potato chunks. Cover and stir occasionally.

Finally, add the cooked lentils and more water if necessary. The vegetables should be barely covered. Boil over medium heat for 15 to 20 minutes until potatoes are soft. Serve with chappatis.

### HOSARYE HOI

*This is pumpkin curry stew, which is eaten in Hunza with chappatis, but elsewhere it adapts gracefully to the accompaniment of other flatbreads or even rice.*

1 kg (35 oz) fresh pumpkin
30 ml (2 Tbs) cooking oil
2 small onions, chopped
2 tomatoes, chopped
1 Tbs turmeric powder
1 tsp red chile powder
1 tsp salt
250 ml (≈ 1 cup) water

Cut the pumpkin in half and take out the seeds before you cut it into bite size chunks. Leave the skin on. Heat the oil in a frying pan, add the chopped onions and cook until transparent. Then add tomatoes and spices and fry on high heat for 5 minutes.

Stir in the pumpkin chunks and the salt. Pour water over the vegetables and cook over low heat, covered, for approximately 10 minutes or until the pumpkin is soft.

### CHAP SHURO

*Hunza meat cakes are fun to make with children, and if you don't have time to make the dough, you can use a ready-made pizza crust.*

**For the dough:**
300 gr (2½ cups) flour
½ tsp salt
150 ml (7 fl oz) water

**For the filling:**
2 green chile peppers, chopped
1–2 onions, chopped
2 spring onions
1 tomato, chopped
3 Tbs coriander leaves, chopped
200 gr (7 oz) ground/minced meat
1 tsp salt

Mix flour with salt and water to make a solid dough. Divide it into four pieces and roll out each piece into a flat round about 20 cm (8") in diameter.

For the filling, chop the chile peppers, onions, spring onions, tomato and fresh coriander leaves quite fine, then mix with the ground meat and salt in a bowl.

Take one round of dough and wet the rim with some water. (Use your finger.) Spread half of the meat mixture on the dough, leaving a space of 1 cm (⅓") around the edge, and top with a second round of dough. Press down the edges and fold over a small rim to seal. Repeat.

Bake on medium heat on both sides for 15 minutes each, until golden brown.

# Breads

## BURUM HANIK

*Chappati and butter—especially the precious* maltash—*is one of Hunza's strongest symbols of hospitality, and it is usually served at the beginning of an event, whether there will be more food or not. It is best cooked using the open flame of a gas stove.*

500 gr (4 cups) flour
200 ml (≈6 fl oz) water
Butter to taste

In a large bowl, mix the flour with about two-thirds of the water and start kneading the dough. Slowly add more water until the dough gets firmer and doesn't stick to the bowl anymore. Knead for at least 10 minutes. Chappati dough should be soft but not sticky. Add more flour if necessary.

Divide the dough into eight even pieces and roll into balls. Sprinkle some flour on a wooden board and roll out each piece with a rolling pin, flipping, rotating and sprinkling the dough with flour to get an evenly round chappati that won't stick to the rolling pin. Each chappati should be about 20 to 25 cm (8–10") in diameter and as thin as your skills allow.

Place the chappati on a heated griddle or iron pan (no oil!) and brown on each side for not more than one minute. Arrange the chappatis on a plate and place some butter in the middle while they're hot. Makes eight chappatis.

## SHURO

*This is a festive white bread.*

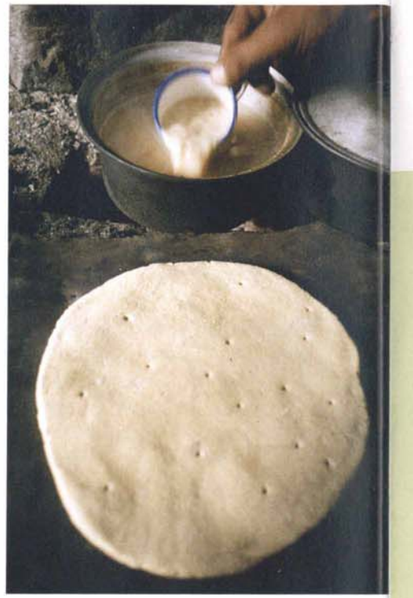
250 gr (2 cups) flour
1 tsp baking powder
2–3 Tbs butter, soft or melted
2 eggs (optional)
1 tsp salt
100 ml (3½ fl oz) milk

Place the flour and the baking powder in a large bowl. Mix in the butter and eggs. Add the salt and milk, and knead until a firm dough forms. Let rest in a warm place for 30 minutes.

Roll the dough out in a round shape. Use a fork to make a nice pattern on the top. Cook on a hot pan or griddle for 1 minute. Finally place the bread in a preheated 250° C (475° F) oven for 20 to 30 minutes. When the shuro begins to turn golden brown, it is done.

## QISTA

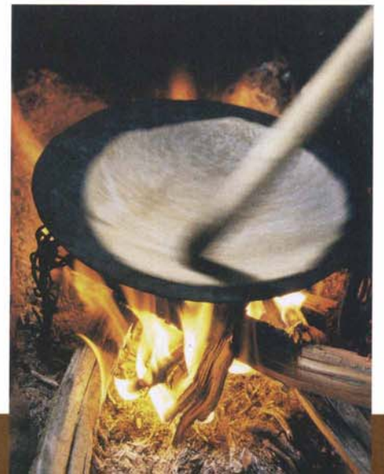
*Even though this Hunza chappati uses self-rising flour, it is actually a yeast bread. In the past, women used a sourdough method, keeping dough near the fire for a long time until natural fermentation produced the desired amount of leavening.*



**Ingredients for two qista**

250 gr (2 cups) self-rising flour
100 ml (3½ fl oz) water
½ tsp salt

Knead the ingredients into a firm dough. Cover the dough with a moist cloth and let it rest for 30 minutes in a warm place. Divide the dough into two balls and roll out each piece with a rolling pin until it is about 7 mm (⅓") thick. Cook on a flat iron pan or griddle on both sides until golden brown.



## MALTASHTZE GIYALING

*These Hunza pancakes are the traditional dish prepared when a daughter visits her parents' home after her marriage. It is eaten with chai (tea). Try it for breakfast.*

200 gr (1⅔ cup) sifted white flour
250 ml (≈1 cup) water
30 ml (2 Tbs) oil
1 egg (optional)

In a bowl, whisk the flour briskly into the water and oil. Add the egg and mix well. Let the mixture sit.

Heat a griddle or crêpe pan and spread with some oil. When the oil starts smoking, pour a generous spoonful of the mixture into the center of the pan and spread it out to a crêpe of about 20 cm (8") in diameter.

When the pancake starts bubbling, flip it over, lower the heat and cook for another one to two minutes. Spread each layer with melted butter and stack.

## BREAD: THE STAPLE FOOD OF HUNZA

Hunza's ubiquitous chappati is actually a culinary import from the south. *Really* traditional Hunza bread is a thin wheat bread known as the *khamali*. Compared to a chappati, it is much larger in diameter, and the reason was practical: Wood for cooking fires is precious, and by baking a large piece of bread you can take advantage of the heat on the rather large cooking plate of a traditional Hunza stove. *Phitti* is probably the most famous of all Hunza breads and a common breakfast food. Thick and nutritious, with a crusty outside and a soft interior, it is time-consuming to prepare: The dough is put into a sealed metal container, and after all the other cooking has been done at night, the phitti is tucked into the embers of the hearth, where it bakes overnight.

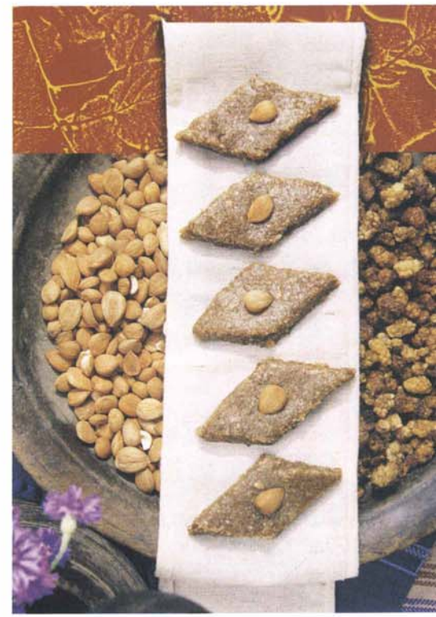
# Dessert

## SULTAN QOQ

This healthy fruit-and-nut bar also makes good carry-along food. It can be adapted to other dried fruits depending on availability and taste. If it's not sweet enough, add a bit of brown sugar.

200 gr (1½ cup) apricot kernels or almonds
200 gr (1¾ cup) walnut halves
200 gr (1¼ cup packed) dried mulberries or sultanas
2 Tbs water

In a coffee grinder or mortar, finely grind the apricot kernels and walnuts and set aside. Then grind the dried mulberries. Mix the ground nuts and the fruits, and add water to make a thick paste. This can either be done in a blender or by hand in a bowl. Roll the paste into a ball and shape it any way you like.



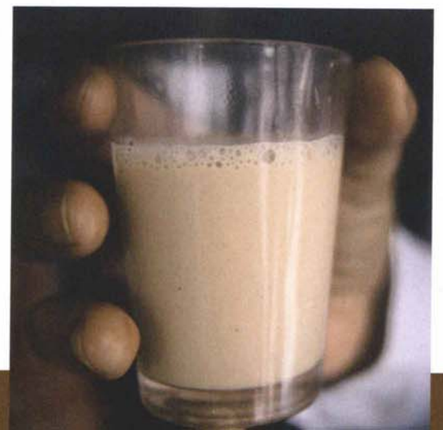
# Drinks

## CHHAMUS

*This is a handmade apricot juice.*

200 gr (1½ cups) dried apricots
1 liter (4 cups + 3 fl oz) water or less, depending on desired thickness

Soak the dried apricots in hot water for about one hour. Traditionally, this juice is literally kneaded by hand for hours until the apricots become soft and finally mix completely with the water. For an easier and much less labor-intensive solution, simply mix the soaked apricots with water in a blender. You can also use fresh apricots with less water.



## TUMURO CHAI

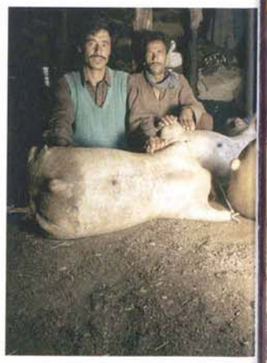
*An interesting tea for westerners, most of whom don't think of thyme as a herb used in tea. In Hunza, it is valued for its medicinal properties: It is said to alleviate headaches, calm nerves and soothe sore throats.*

4 tsp dried wild thyme
500 ml (≈2 cups) water

Add the thyme to the water in a pot and bring to a boil. Let the tea boil for a few minutes to extract the flavor from the leaves. Strain before serving.

## BALINGI CHAI

*Or try walnut tea.*

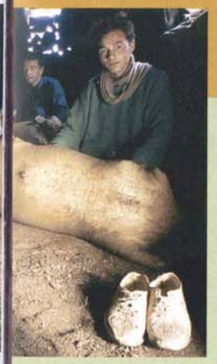


8 walnuts, shelled
4 tsp black tea
500 ml (≈2 cups) water
milk if desired

Crush the walnuts in a mortar or process in a blender. Mix with the black tea and add to the water in a pot. Bring to a boil. Once the water is boiling, add the milk. When the milk starts to rise, take the tea off the heat. Serve with sugar or honey.



Above: **Apricots dry in the sun.** Right: **The cooks, community members and project coordinators, from left to right: Dadai, Huri, Kanzul Nisa, Bibi Rashida, Bibi Ghulab, Bibi Soni, Salma Karim, Bibi Hawa, Bibi Kaniza, Rahmat Ali, Zalbu Nisa, Tahmina Begum, Mariele Paley, Marta Luchsinger, Ghulam Sarwar, Naseema, Bibi Taheera, Shahzadi, Janimo, Khosh Baig, Tahmina, Bibi Mariam, Parveen, Bibi Zaineb, Gulala, Brig, Hissam Ullah Baig, Khalifa Bulbul Shah, Ghulam Mohammad, Bibi Kaniza, Dr. Khawaja Khan, Tajo, Ali Madad. The women of Karimabad are deeply knowledgeable about the art of caring for others, especially the less fortunate. The women agreed that the funds obtained from the sale of their small recipe book would be devoted to improving the provision of health services for their community. The book sold out its 1700-copy first printing quickly, and the funds are awaiting the community's decision.**



## *DILTAR:* THE REFRESHING YOGURT DRINK

People call it buttermilk, *lassi* or simply a yogurt drink. Traditionally, diltar is prepared in a goat- or sheep skin which is shaken or rolled on the ground until butter forms. An alternate method uses a tall, narrow wooden cylinder and a long, thick pole in a process much like churning butter. Nowadays, the simplest way to make diltar is to mix yogurt with an equal amount of water and blend at high speed for a few minutes. Add salt, sugar or fruits like bananas or mangos as you please.

Social anthropologist **Dr. Julie Flowerday** has lived and worked extensively in the Hunza Valley. Her e-mail is flowerda@email.unc.edu.

**Mareile Paley** is a graphic designer who lives in Hong Kong with her husband, free-lance photographer **Matthieu Paley** (www.paleyphoto.com).

**Marta Luchsinger,** who coordinated production of the recipe book, visited Hunza as a doctoral student at the University of Bath.

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

Hunza: J/F 83
Hunza flatbreads: S/O 95

# ClassroomGuide

WRITTEN BY JULIE WEISS

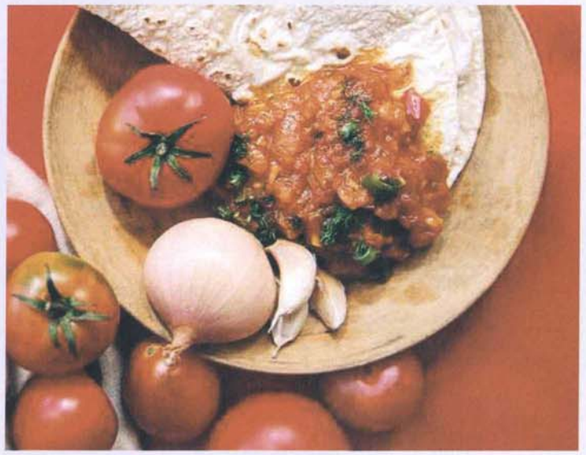

**For students:** We hope this two-page guide will help sharpen your reading skills and deepen your understanding of this issue's articles.
**For teachers:** We encourage reproduction and adaptation of these ideas, freely and without further permission from *Saudi Aramco World*, by teachers at any level, whether working in a classroom or through home study.

—THE EDITORS

## Analyzing Visual Images

Food photography is big business. If you've ever seen the glossy and expensive cookbooks at any bookstore, you can see why: People like to look at food, and it sells. The food may be as basic as it gets, but photographing it is anything but basic.

How do photographers make food look interesting? One way is by creating an interesting composition. Look at Baloganze Pitchu, **right** (and on page 38). Which part of the photograph is the actual appetizer, and which parts show ingredients that went into making it? Why do you think the photographer included the ingredients? What shapes do the ingredients have in common with the food and the plate? Why do you think most—but not all—of the food in the photo is on a plate? Why might the photographer have chosen a red background for the photo? As you answer these questions, imagine that the photograph were different: What if it included only the finished Baloganze Pitchu on a plate? What if the background were blue? What effect might that photo have on a viewer? What other questions can you think of to ask about the photo?



For another photo that includes both ingredients and a finished product, look at Sultan Qoq on the cover and on page 41. What can you tell about Sultan Qoq because the ingredients are included? This photo also has a particularly complex composition. What shapes do you see in it? How are they situated relative to each other? Where does the boldest color come from? How would the photo look if it weren't there? Would the photo be different emotionally? Do you think that would be better, or worse? Why?

Photographers also choose the perspective, or angle, from which they shoot the food. Often it's looking down, as you would look at a plate set before you. Sometimes it's not: Look at the photos of Chap Shuro and Hosarye Hoi on page 39. The photographer wasn't exactly at eye level with the food, but these are not bird's-eye views, either. See if you can describe how these photos differ from the first photo you examined.

Sometimes a photograph of food contains other objects—say, a spoon in a bowl of soup, or a hand holding a glass. Why? Do you like the effects? How many different effects do you see in "Cooking in Hunza"?

## Class Activities

### Theme: Global Connections

Many countries have histories that involve periods of isolation and periods of connection. One particularly well-known example of isolation is Japan between the 1600's and the 1800's, when the Japanese restricted contact with the outside world almost completely. But today, advances in communications and transportation have made isolation far more difficult. Every country struggles to find the right mix of keeping to itself and interacting with others. (Much like individuals!)

**How can you tell that a place has connections to other parts of the world?**

Without thinking much about it, you're probably "in touch with" other parts of the world just about every hour of every day. If you use the Internet, for example, you can read articles published all over the world. Any vehicle you ride in is probably made from pieces manufactured in many different countries. How many countries are represented by the clothes you are wearing?

With a small group, look for objects that show how you, your town or your school are connected to other parts of the world. Start indoors, and then go on an outing. List the evidence of "global connections" that you see. If you aren't sure where something connects, research it.

Three articles in this issue of *Saudi Aramco World* address this global-connections theme. Read "An Oasis in the Balance," "The Diplomacy of the Sons" and "Cooking in Hunza." Use a highlighter to identify the objects in each article that let you know the places are not isolated. Add them to the list your group put together from your outing.

With your group, study your list. Use at least three different highlighters to categorize the objects as related to communication/information (e.g., telephone, computer), transportation (e.g., highway signs), and food. What other categories do you find?

**What encourages connections between people in different places? What discourages them?**

Now think about what makes such connections possible, or what would make them impossible. Read "The Diplomacy of the Sons." Start with the problems. Discuss with your group what made relations between Central Asians and Chinese difficult in the late 1300's and early 1400's. Think broadly. Include physical features, people and beliefs. Summarize your thoughts by writing a short paragraph to follow this topic sentence: *Several factors inhibited connections between the people of Central Asia and the people of China around the turn of the 15th century.* Then discuss what drew the two groups of people together. Write the same kind of summary paragraph. When you look at the two paragraphs, what generalizations can you make about what encourages connections and what discourages them?

For the next step, try applying these generalizations to a situation in the world today. Start with two countries that are allies. What brings them together peacefully? Then think about two countries that are not on friendly terms. What factors contribute to the tensions? Do any of these current situations fit the model you put together based on the history of Central Asia and China?

**What are the benefits of being connected to faraway places? What are the drawbacks?**

Make a T chart. Title the left-hand column "Benefits of Connection" and the right-hand column "Drawbacks of Connection." Reread "An Oasis in the Balance," "The Diplomacy of the Sons" and "Cooking in Hunza." Use the information in all three articles to fill in the two columns. You can also refer back to the list of objects that show you're connected to the rest of the world: Which of those objects improve your life? Which, in your opinion, don't? Add them to your chart. Then, would you say the benefits outweigh the drawbacks? Or is it the other way around? What's your opinion of the balance? Write a persuasive first-person essay about whether the benefits of global connections outweigh the drawbacks or vice versa.

### Theme: Water

We humans depend completely on water for life. We are, even today, at its mercy. Think, for example, about droughts, tsunamis and hurricanes. For thousands of years, people have tried to manage water, trying to exert some control over this crucial—and often unpredictable—resource. In the following activities, you'll explore the complex relationship between people and the elixir of life.

**How does water shape society?**

In modern life in many places, people don't see where water comes from. In such places, it's easy to think of water as something that automatically comes out of a faucet no matter what. There always seems to be enough. Of course you know that's not necessarily true, but if you're far enough away from the sources of water, you can easily think that there's an endless supply. But in some places, people are acutely aware of water's scarcity—or its overabundance.

Think about water in your daily life. Write a journal entry that answers some of these questions: Where does your water come from? What questions do you have when you think about water? Can you have as much as you want? Has it always been that way? Imagine how your life would be different if you couldn't get enough water. How would the scarcity of water affect your life? How would your life be different if you could not have as much water as you wanted?

Now read about how water has shaped whole societies in the past. Read "The Last Nile Flood" and "The Art and Science of Water." Divide the class into groups. With your group, make a web. Put water in the center. From the center, make three spokes: one for government, one for agriculture and one for culture. According to the articles, how did water influence each of these areas at the times and in the places the articles discuss? Make the web by writing your answers across the spokes of each topic.

With your group, study the web. Think about life today. Does water affect it in any of the same ways it affected the long-ago societies you read about in the two articles? Does water affect those areas of life in different ways now? If so, use a different color to add them to your web. Discuss what other resources might have a big impact on modern life where you live.

**How do people try to manage water?**

Hydrology, according to "The Art and Science of Water," is the study of the control of the movement of water. For thousands of years, people have tried to alter where water goes.

"The Last Nile Flood" reports that in 1964 Egypt first sealed the Aswan High Dam to begin controlling the river's flowing and flooding. Do some historical research about the building of the dam. (Or, for a larger project, dams in general.) Who decided to build it, and how did they decide? Was the decision controversial? Who opposed it? Why? What effects, both positive and negative, has the dam had? If time permits, research these questions in regard to other dams.

Of course, there are many less drastic ways of managing water. "The Art and Science of Water" describes some of them. Underline the different ways people written about in the article managed water's movement. What surprises you most about what you've underlined? Why does it surprise you?

Now look back at the journal entry you wrote about water. Add to it. What have you discovered? How might your discoveries affect your thoughts and feelings about water? How might they affect how you use water?

**Julie Weiss** is an education consultant based in Lowell, Massachusetts; she holds a Ph.D. in American studies. Her company, Unlimited Horizons, develops curricula in social studies, media literacy and English as a second language, and produces textbook materials.

# Events&Exhibitions

**The Road to Byzantium:** Luxury Arts of Antiquity challenges the conventional idea that the art of the newly Christian Byzantine Empire, usually represented by icon painting, completely rejected the styles and themes of classical Greece and Rome. By presenting objects of luxury from this period, rather than icons, the exhibition demonstrates the remarkable continuity of the classical traditions, especially in precious metalwork, jewelry and ivory. More than 160 objects from the State Hermitage Museum in St. Petersburg, such as finely decorated silver and gold, cameos and Athenian red-figure vases, along with objects from the British Museum and the Victoria and Albert Museum, tell the story of the development of art over a thousand-year period from sixth-century Greece to the Middle Ages. Somerset House, **London,** through September 3.

**Though it dates from the age of Justinian (AD 527–565), and from his capital, Constantinople, this silver dish, with its beautifully executed image of a goatherd with his animals, is reminiscent of the art of Hellenistic Greece. The dish is not quite 24 cm (9.4") in diameter.**

© THE STATE HERMITAGE MUSEUM

**Mountains, Monasteries and Minarets** is an exhibition of Caroline Lees' recent paintings of Russia, Oman, Egypt, Yemen, Morocco and London. Rafael Valls, Ltd., **London,** through May 25.

<< Ongoing

**Teaching About the Arab World and Islam** is the theme of teacher workshops conducted by Arab World and Islamic Resources and School Services (AWAIR) of Berkeley, California and sponsored by Georgetown University's Alwaleed Center for Muslim–Christian Understanding. The program is fully funded and workshops may be requested by any school, district, office of education or university. ⓘ www.awaironline.org or 510-704-0517. Cities and dates currently scheduled include: **Las Vegas,** May 18–20; **Honolulu,** July 10–13; **Asilomar, California,** September 28–30.

**Treasures from Olana:** Landscapes by Frederic Edwin Church features 18 of the artist's own paintings that he displayed in his carefully devised interiors at Olana. The majority are landscape oil sketches, which illustrate the artist's favorite domestic landscapes and his journeys not only to the Middle East, but also to South America and Europe. During a period of debate regarding the artistic merit of an oil sketch versus a finished painting, Church boldly exhibited these *plein-air* oil sketches as finished works of art alongside his precisely rendered "Great Pictures"—a testament to his belief in the quality of these smaller works. This is the first time they have been displayed together outside Olana. **Portland [Maine]** Museum of Art, May 20 through September 10; Huntington Library, **San Marino, California,** October 14 through January 3, 2007.

**Crescent Moon:** Islamic Art and Civilization in Southeast Asia refutes the European assumption that Islamic art stops at India by presenting secular and religious artifacts from Indonesia, Malaysia and the Philippines and from the Muslim communities of Thailand, Burma, Cambodia and Vietnam—all lands largely cut off from the influence of Ottoman, Persian or Mughal art. Gold jewelry, blue-and-white porcelain, silks, lacquer, batiks, a banner showing the Sword of Zulfikar and more than a score of illuminated manuscripts, including a 19th-century copy of the Kur'an from Aceh, illustrate the transformation of indigenous motifs and techniques into new art forms. National Gallery of **Australia, Canberra,** through May 28.

**1001 Inventions:** Muslim Heritage in Our World demonstrates the scientific contributions made by scholars of the Muslim world, using engineering principles, historical manuscripts and multimedia technology to recall a "golden age" of scientific innovation by Muslim scholars between the years 500 and 1500. Coffee, soap and public baths, clocks, experimental optics and the first attempt at flight are among the contributions discussed. Museum of Science and Industry, **Manchester, UK,** through June 4.

**Tiraz:** Early Islamic Textiles comprises nine rarely seen fabric fragments, one bearing the name of Caliph Marwan II. Created between the seventh and 13th centuries, *tiraz* are a type of textile popular in the early and medieval Islamic periods. Although the term comes from the Persian word for "embroidery," it came to signify the luxurious and expensive textiles produced as gifts of honor and symbols of power in public and royal factories throughout the Islamic world. Particularly through the 10th century, examples of tiraz from North Africa showed continuity with the artistic forms of the Greco-Roman period, and when Egypt came under Muslim control, North African craftsmen incorporated aspects of that symbolic vocabulary into Arab artistic forms. Thus some early Islamic textiles in this exhibition demonstrate combinations of such late antique and Coptic motifs as human and animal figures. **Brooklyn** Museum, **New York,** through June 4.

**Layered Lives:** Iranian Armenian Identity Through Contemporary Arts features a cross-section of work through which Iranian-Armenian artists reveal both their contemporary identity as a minority and their strong attachment to Iran. Brunei Gallery, SOAS, **London,** through June 24.

**The World in Colours:** Ceramics With Coloured Decoration Dating From 700 to 1920 goes beyond blue-and-white to explore other methods of decorating ceramics that had been used in China long before cobalt and were influential far beyond its borders. Besides Chinese pieces, vessels from Japan, Vietnam, the Middle East and Europe demonstrate the broad impact of Chinese techniques. Catalog £10. Seminar June 14, £25. Brunei Gallery, SOAS, **London,** through June 24.

**Gentile Bellini and the East** explores the convergence of influence and cultures in the Mediterranean during the Renaissance and highlights Bellini's role as a conveyer of cultures between East and West. Bellini, an important Venetian artist, traveled to Constantinople in 1479 to work at the court of Mehmet II, the Ottoman conqueror of Constantinople. The sultan had been at war with Italy, but requested an artist's services as soon as a peace was signed with Venice; the artist was to paint Mehmet's portrait and help decorate the new Topkapı Palace. The exhibition centers on Bellini's portrait of Mehmet II and on his *A Seated Scribe*, but also includes all the works Bellini created in Turkey, as well as other Byzantine and Islamic artifacts. National Gallery, **London,** through June 25.

**From Córdoba to Samarkand:** Masterpieces of the New Museum of Islamic Art in Doha is a preview of 42 of the finest and most representative objects among the several thousand that make up the Qatari national collection. These 42 objects, and many others, will be displayed in the resolutely innovative, 31,500-square-meter Doha museum designed by I. M. Pei and scheduled to open in 2007. Two models of the museum complex—which will also include a national library, a museum of national history and a museum of photography—are also on display. Musée du Louvre, **Paris,** through June 26.

**Egypt Through Other Eyes:** The Popularization of Egypt presents more than 30 books to document western fascination with ancient Egypt in the 19th and early 20th centuries. Showcasing many works never before on public view, the exhibition includes rare material from the museum's Wilbour Library of Egyptology, one of the world's most comprehensive Egyptological research collections. **Brooklyn** Museum, **New York,** through June.

**Saladin and the Crusaders.** Sultan Saladin, considered the epitome of religious tolerance, and his opponent King Richard Lionheart, the ideal of knightly virtue, are the focus of this



<< Ongoing

exhibition, which takes the visitor into the encounters and confrontations of the Middle East at the time of the Crusades. The meeting of European and eastern cultures was of great importance in European history, and this exhibition shows that it included peaceful relations and cultural exchange as well as armed conflict. The exhibition views events in the Crusader States between 1099 and 1291 from both eastern and western perspectives and is the first to juxtapose Christian and Muslim cultural artifacts. At its Oldenburg venue, it emphasizes the role of the Near East as a mediator of knowledge; at Mannheim, the artistic transfer and historical aspects of the meeting. Focusing on regional history, the State Museum at Halle demonstrates the effects of the Crusades on Central Germany. The various exhibits include jewelry, weapons, coins, astronomical instruments and sculptures, reliquaries and the Magic Ring of Paussnitz, and are supplemented by models, paintings, photographs and large-scale installations. 600-page catalog, €28. State Museum for Nature and Mankind, **Oldenburg, Germany,** through July 2; Reiss-Engelhorn Museums, **Mannheim, Germany,** July 23 through November 5.

**Hatshepsut:** From Queen to Pharaoh. The great female pharaoh of Egypt's 18th Dynasty ruled for two decades, first as regent for, then as co-ruler with, her nephew Thutmose III. During her reign at the beginning of the New Kingdom, trade relations were reestablished with western Asia and extended to the Land of Punt far to the south, as well as to the Aegean Islands in the north. The prosperity of this time was reflected in its art, which is marked by innovations in sculpture, decorative arts and such architectural marvels as Hatshepsut's mortuary temple at Deir al-Bahri. Items from the museum's own collection are supplemented by loans from American and European museums, and from Cairo. Metropolitan Museum of Art, **New York,** through July 9.

**The Tablet and the Pen:** Drawings from the Islamic World uses 28 examples from Turkey, Iran and India to explore the development of drawing as an independent artistic medium; as part of the process of design for paintings, textiles and metalwork; and as a catalyst for artistic experimentation. It emphasizes aspects of technique and illuminates the historical circumstances that affected the development of the medium and the increased demand for single-sheet drawings in the 16th and 17th centuries. Sackler Museum, **Cambridge, Massachusetts,** through July 23.

**The Royal Tombs of Ur:** Ancient Treasures From Modern Iraq. Ur was one of the most powerful city-states in ancient Mesopotamia. By 2600 BC, the city may have had 40,000 residents. It traded its surplus grain, wool and manufactured textiles with Egypt, Anatolia, Iran, the Persian Gulf region, and South and Central Asia—then the entire known world. It was during this period of prosperity that the kings and queens of Ur were laid to rest in the magnificent tombs Sir Leonard Woolley uncovered between 1922 and 1934. The Royal Cemetery of Ur proved to be the most amazing archeological find of the period; it included the tomb of Lady Puabi, identified by a seal bearing her name that was found on her body. Miraculously untouched by looters, her tomb was filled with beads and gold jewelry, and she wore an elaborate gold headdress; an ornate diadem of gold and lapis lazuli lay near her head. Many more artifacts, now world-famous, were found in the larger cemetery, including extravagant jewelry of gold, lapis lazuli and carnelian; cups of gold and silver; bowls of alabaster; extraordinary objects of art and culture; and several of the world's earliest known musical instruments, such as a gold and lapis bull-headed lyre. More than 400 artifacts from the excavations are on display. **Houston** Museum of Natural Science, through August 13.

**Tut Unwrapped** explores the life of ancient Egypt's King Tutankhamun and reveals what has been learned by analyzing his mummified remains. From archeologist Howard Carter's examination of the mummy in the 1920's to x-rays made in 1968 and 1978 and CT-scans taken of the body in 2005, some questions have been answered, but many more are raised. **Houston** Museum of Natural Science, through August 13.

**Harpies, Mermaids, and Tulips:** Embroidery of the Greek Islands and Epirus Region includes some 70 textiles created between the 17th and 19th centuries for bridal trousseaux and domestic use, and explores the great diversity of design, structure and function that developed in a geographically small area. Epirus—under Ottoman rule for almost five centuries—and the islands of the Aegean and Ionian Seas were located at a crossroads of trade among western Asia, the Black Sea and Europe, and the region was exposed to and assimilated artistic influences of the Venetians and the Ottomans, the two principal cultures vying for dominance—and influencing each other—in the early modern period. Catalog $35. Textile Museum, **Washington, D.C.,** through September 3.

**Persian Steel:** The Tanavoli Collection presents more than 300 intricately designed steel items—tools, household implements and ceremonial objects—that carry the visitor back to the Safavid and Qajar periods in Persia, where steel was an integral part of economic, social and religious life, and every tool and instrument, be it never so humble, was a work of art meant to be cherished. The objects were collected over the past 30 years by Iranian sculptor Parviz Tanavoli, who admired their superb workmanship and their makers' keen attention to form. **Vancouver** Museum, through September 4.

**African Mud Cloth:** The Bogolanfini Art Tradition of Gneli Traore of Mali exhibits some 40 textiles made between 1966 and 2000, mostly by Gneli Traore (died 2002) and her children. Made of locally produced narrow strips of white cotton cloth woven together, bogolanfini is covered with geometricized designs that depict legends, historical events, heroes, morality tales, life situations, and the physical elements and animals in the world of the Bamana people. The designs are created by artists painting in the backgrounds with mud on cloths previously treated with a herbal mordant. An catalog accompanying the exhibition shows changes in both techniques of making bogolanfini mud cloth and in its designs and patterns, and explains their symbolism. African Art Museum of the SMA Fathers, **Tenafly, New Jersey,** through September 4.

**Nomads in the Art Gallery:** Encounters with Modernity from Bayer to Sol LeWitt juxtaposes magnificent Anatolian kilims from the Norbert Prammer collection with 20th-century artworks from the Lentos Museum's holdings to present a multifaceted view of design in its fundamental forms. Paintings, drawings, objects and photographs meet kilims that date from the 17th century to the early 19th century. ⓘ +43-732-7070-3602; www.lentos.at. Lentos Kunstmuseum **Linz, Austria,** through September 10.

**The Fabric of Life:** Ikat Textiles of Indonesia. Renowned for the richness and variety of their textiles, the peoples of Indonesia have the most complex and esthetically sophisticated fabrics of all of the Pacific islands. Their lives are interwoven with textiles, beginning in earliest infancy and continuing until the wrapping of the funerary shroud. This exhibition examines the variety of form, function and imagery of a single important and technically intricate Indonesian tradition known as *ikat*. A number of distinctive regional traditions will be included. The imagery ranges from boldly geometric compositions to figural patterns woven with astonishing artistic and technical virtuosity. Metropolitan Museum of Art, **New York,** through September 24.

**No Place for a Lady** explores aspects of the history of women's travel, from the difficulties of transportation to visiting harems and climbing the Pyramids. Featuring artifacts related to travel complemented by others reflecting the many cultures women travelers encountered, the exhibition focuses on women from the 18th century to the 1930's, including Lady Mary Wortley Montagu, Lady Hester Stanhope, Ida Pfeiffer, Jane Dieulafoy, Isabella Bird and Gertrude Bell. **Vancouver** Museum, through October 1.

**Petra:** Lost City of Stone, a traveling exhibition, features extraordinary art and artifacts from the red sandstone cliff city in southern Jordan. Petra was a major crossroads of international trade routes from the first century BC to the second century of our era, when it was governed by the Nabataeans, who were renowned for their skills in trade, agriculture, engineering and architectural stone carving. The exhibition presents some 200 objects, including stone sculptures and reliefs, ceramics, metalwork and ancient inscriptions, and a selection of 19th-century artworks documenting the European rediscovery of Petra. Canadian Museum of Civilization, **Ottawa, Canada,** through January 2, 2007.

**Mummies:** Death and the Afterlife in Ancient Egypt features 140 objects—including 14 mummies and/or coffins, the largest collection ever to leave the British Museum—and illustrates the fascinating story of how Egyptians prepared and sent the dead into the afterlife. It covers embalming, coffins, sarcophagi, *shabti* figures, magic and ritual, amulets and papyri, and displays furnishings created specifically for an individual's coffin, such as spectacular gold jewelry and a wooden boat to transport the dead into the underworld. Bowers Museum, **Santa Ana, California,** through April 15, 2007.

<< May

**Beasts of the Nile** explores the important role that animals of all shapes and sizes played in ancient Egypt, exhibiting mummies, bronzes, textiles, pottery and wooden sculptures and including 20 remarkable objects from the British Museum. North Lincolnshire Museum, **Scunthorpe** [UK], May to July; **Swansea** [UK] Museum, August 14 through mid-November.

**Word into Art:** Artists of the Modern Middle East demonstrates the powerful and imaginative ways in which artists across the Middle East and North Africa are using the Arabic script today. Based largely on the museum's own collection, the exhibition features beautiful Arabic calligraphies, books of poetry and works which reflect current political issues of the Middle East. British Museum, **London,** May 18 through September 3.

**Woven Jewels From the Black Tents:** Baluchi, Aimaq, and Related Tribal Weavings of Iran, Afghanistan, and Pakistan. The women of the nomadic and settled Baluchi tribes have long produced distinctively beautiful weaving, largely for their own use, that includes kilims and pile rugs, pile and flat-woven bags, and animal trappings. Baluchi weaving tends to be rich but somber in color, and the rugs are known for their velvety pile and the silky sheen of the wool, the result of minerals in the soil of Baluchi pasturelands. The exhibition presents the whole range of Baluchi and related weavings, including some "war rugs" produced during the late 20th century in Afghanistan. **Georgia** Museum of Art, **Athens,** May 20 through July 30.

**Arabia's History in the Nineteenth Century:** A List of Petty Wars and Internecine Broils. Social anthropologist Paul Dresch lectures following the annual general meeting of the Society for Arabian Studies. 5:30 p.m. Khalili Lecture Theatre, SOAS, **London,** May 24.

**Tutankhamun and the Golden Age of the Pharaohs** includes 130 works from the Egyptian National Museum and presents a selection of 50

*Continued from previous page*

<<< May spectacular objects excavated from the tomb of Tutankhamun, including one of the canopic coffinettes, inlaid with gold and precious stones, that contained his mummified internal organs. Additional pieces in the exhibition derive from the tombs of royalty and high officials of the 18th Dynasty, primarily from the Valley of the Kings. These additional works place the unique finds from the tomb of Tutankhamun into context and illustrate the wealth and development of Egyptian burial practice during the New Kingdom. The exhibition, more than twice the size of the 1979 "King Tut" exhibition, marks the first time treasures of Tutankhamun have visited America in 26 years. Field Museum, **Chicago**, May 26 through January 1, 2007.

<<< June **The Quest for Immortality:** Treasures of Ancient Egypt dramatically illustrates the ancient Egyptian concept of the afterlife through 143 magnificent objects and a life-sized reconstruction of the burial chamber of the New Kingdom pharaoh Thutmose III (1490–1436 BC). This exhibition includes objects that have never been on public display and many that have never been seen outside Egypt, selected from the Egyptian Museum in Cairo, the Luxor Museum of Ancient Art and the site of Deir el-Bahri. Ranging in date from the New Kingdom (1550–1069 BC) through the Late Period (664–332 BC), the works of art include luxurious objects that furnished tombs, including jewelry, painted reliefs, implements used in religious rituals, a sarcophagus richly painted with scenes of the afterlife and an ancient painted model of the royal barge that carried the pharaohs along the Nile. Frist Center for the Visual Arts, **Nashville**, June 8 through October 8; **Portland [Oregon]** Art Museum, November 5 through March 4, 2007.

**Textile & Tribal Art:** The HALI Fair presents rugs, other textiles and ethnographic art for sale by some 75 international dealers. Their offerings are divided into three areas: traditional (rugs, kilims, textiles, embroideries and tapestries from Africa, the Middle East, the Caucasus and the Americas), tribal (ceremonial and decorative works from Africa, Australasia, Oceania and the Americas) and the "Design Zone" (contemporary ceramics and weaving that use traditional skills). National Hall, Olympia, **London**, June 8–18.

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Box 2106
Houston, Texas 77252-2106

<<< July **Facing East:** Portraiture Across Asia explores how portraits expressed cultural identities in Asia and the Ancient Near East over millennia. Paintings and sculptures of Egyptian pharaohs, Chinese empresses, Japanese actors, Indian rajas and a host of other subjects reveal how the identities, importance and power of historical subjects were diversely constructed, understood and represented. The exhibition raises questions not only about how portraits are used, valued and understood in Asian cultures, but also about their employment in works of art. Sackler Gallery, **Washington, D.C.**, July 1 through September 4.

**Teachers' Institutes on Understanding and Teaching About Islam** include classes on Islamic faith, practice, history and culture taught by university professors from the US and abroad. Participants will become more familiar with teaching resources, as well as techniques for integrating them into the social studies, religion or world-history curriculum. There is no charge to educators who attend this program: Participants pay only for their travel to New Mexico. Dar al Islam provides books and supplementary teaching materials, on-site room and board, and transportation to and from the Albuquerque Airport. ⓘ www.daralislam.org; kdalavi@valornet.com; 505-685-4515, x 24. **Abiquiu, New Mexico**, July 5–16.

**Indian Jewelry at the Time of the Grand Moghuls:** The Al-Sabah Collection, National Museum of Kuwait is a landmark exhibition of more than 300 spectacular examples of Mughal and other related jeweled objects. The grand imperial vision, refinement and opulence for which the Mughal rulers of India (1526–1858) were renowned found ultimate expression in their jeweled arts. Among the highlights of the exhibition are a historically important spinel inscribed with the titles of multiple imperial owners from several Islamic dynasties; splendid ornaments for personal adornment, such as a cameo pendant carved with a portrait of the emperor Shah Jahan; a gem-encrusted dagger; brilliantly enameled courtly objects; and jade and rock-crystal bowls set with precious stones. In addition to jewelry and gems, the exhibition includes magnificent works of hardstone inlay, delicate sculptural forms in hardstones, ornate hammered relief in precious metals (primarily gold) and "Oriental damascene" (gold-embellished steel). Enamels from the Mughal period—characterized by a tremendous range of brilliant colors, distinctive motifs and decorative effects—are also on view. Musée du Louvre, **Paris**, July 6 through September 4.

**Sovereign Threads:** A History of Palestinian Embroidery highlights magnificent embroidery and colorful dresses from the late 19th and early 20th century in the Munayyer Collection. Complementing the dresses is contemporary embroidery work by Ina'ash in Lebanon. Embroidery patterns, some traceable back to pre-Islamic and pre-Christian times, were incorporated into the rich designs and brilliant colors that identify the specific village or town in Palestine where the dress was made. The collection, one of the most extensive in America, is presented by the Palestinian Heritage Foundation. Craft and Folk Art Museum, **Los Angeles**, July 15 through September 15.

**The Jameel Gallery of Islamic Art,** renovated thanks to a gift from the Abdul Latif Jameel Group, opens to house treasures from the V&A's collection of 10,000 Islamic objects from the Middle East, including the famous Ardabil Carpet from 16th-century Iran and an exquisite rock-crystal ewer from 11th-century Egypt. The displays will explain how Islamic art developed from the great days of the Islamic caliphate in the eighth and ninth centuries. Other objects include ivories from Spain, metalwork from Egypt, Iznik ceramics from Ottoman Turkey and oil paintings from 19th-century Iran. The collections highlight the fruitful interchange between the Islamic world and its neighbors in Europe and Asia. Victoria & Albert Museum, **London**, July 20.

<< August **Modern Indian Works on Paper** includes 50 works produced since 1947 by a broad range of Indian artists, from members of the groundbreaking Progressive Artists Group to other first- and second-generation modernists, and from M. F. Husain and Anish Kapoor to Krishna Reddy, Francis Newton Souza and Arunanshyw Chowdhury. At times drawing on their own deep cultural heritage, at others looking forward with novel techniques, these artists have extended modernism beyond the western world. **Georgia** Museum of Art, **Athens**, August 12 through October 8.

<< October **Art of Being Tuareg:** Sahara Nomads in a Modern World. The elegance and beauty of the Tuareg peoples—their dress and ornament, their large white riding camels, their refined song, speech and dance—have all been rhapsodically described by travelers in Niger, Mali and Nigeria. This exhibition explores the history and culture of the Tuareg through their silver jewelry, clothing, leather purses, bags and saddles, and other highly decorated items. UCLA Fowler Museum of Cultural History, **Los Angeles**, October 15 through February 25, 2007.

**Cultural Connections of the Red Sea** is the third conference on the Red Sea sponsored by the Society for Arabian Studies. ⓘ j.c.m.starkey@durham.ac.uk. British Museum, **London**, October 27–28.

**Persian Visions:** Contemporary Photography From Iran presents more than 80 images that provide a revealing view of Iranian life and experience. The 20 artists featured are among Iran's most celebrated and include Esmail Abbasi (references to Persian literature), Bahman Jalali, Shariyar Tavakoli (family histories), Mehran Mohajer, Shoukoufeh Alidousti (self-portraits and family photographs) and Ebrahim Kahdem-Bayatvin. Some have lived abroad and returned to view their homeland from a changed perspective. Anti-exotic and specific, these images make up the first survey of contemporary Iranian photography to be presented in the United States. Michigan Avenue Galleries, **Chicago** Cultural Center, October 28 through December 31.

<< March 2007 **Venice and the Islamic World:** 828–1797 examines this important artistic and commercial relationship over a thousand-year period, focusing on artistic and cultural ideas that originated in the Near East and were channeled, absorbed and elaborated in Venice, a commercial, political and diplomatic "magnet" on the shores of the Mediterranean. The exhibition focuses on the reasons many Venetian paintings, drawings, printed books and especially decorative artworks were influenced by and drew inspiration from the Islamic world and its art. Its second theme deals with works of Islamic art that entered Venetian collections, exploring how and why they got there and the nature of the artistic relationships between Venice and the Fatimids and Mamluks, the Ottomans and the Safavids. "Orientalism" in Venice was based on direct contact with the Islamic world and the transfer of new technological, artistic and intellectual information; Venetian objects will be studied face-to-face with Islamic works of art, providing immediate, comparative visual references. Catalog. Metropolitan Museum of Art, **New York**, March 27 through July 8, 2007.

<< Permanent **Arts of the Islamic World Gallery** at Doris Duke's estate, Shangri-La, houses her magnificent collection of tiles, textiles, paintings, jewelry and furniture, and other objects reflecting both the secular and religious life of Islam in countries around the world. ⓘ 866-385-3849. **Honolulu** Academy of Arts.

**Nubian Gallery.** New permanent installation of artifacts documenting Nubia from the fourth millennium BC into the common era. The gallery displays sculpture, glass, pottery and metalwork, including never before exhibited objects such as a heavily tooled archer's quiver and 2000-year-old textiles. Oriental Institute Museum, **Chicago**.

**Glimpses of the Silk Road:** Central Asia in the First Millennium documents an astonishing amalgam of different influences, combining Hellenistic imagery and Near Eastern motifs with Chinese and Indian features. Goods and raw materials as well as new ideas, religious beliefs, artistic styles and motifs, and technological innovations were transmitted throughout the region along the Silk Road. Wall paintings from the Kushan kingdom and later Kucha illustrate this blend of eastern and western traditions. Two Parthian ivory rhytons from Nysa exemplify the transmission of technology and motifs in the applied arts, combining Iranian and Greek themes and styles. Metropolitan Museum of Art, **New York**.

**Egypt Reborn:** Art for Eternity is an installation of over 1200 Egyptian artifacts that makes available masterpieces of every period of ancient Egyptian history, including some of the most important in the world. The exhibition ranges from the Predynastic Period (ca. 4400 BC) to the 18th Dynasty reign of Amunhotep III (ca. 1353 BC), including such treasures as an exquisite chlorite head of a Middle Kingdom princess, an early stone deity from 2650 BC, a relief from the tomb of a man named Akhty-hotep, and a highly abstract female terra-cotta statuette created more than 5000 years ago. Additional exhibits illustrate themes in Egyptian culture, including women's roles, permanence and change, temples and tombs, technology and materials, art and communication, and Egypt and its relationship to the rest of Africa. Brooklyn Museum, **New York**.

**Alexander's Image and the Beginning of Greek Portraiture** illustrates the reign of Alexander the Great of Macedon and the beginning of portraiture through ancient coins. Alexander opened the way to revolutionary economic and ideological changes in the ancient monetary system, and his idealization and deification on the coins of his successors led to new ways of representing the human figure. With the images of Alexander the Great, the use of individualized portraiture for purposes of political propaganda began in the western world. Sackler Museum, **Cambridge, Massachusetts**.

**The Saudi Aramco Exhibit** relates the heritage of Arab-Islamic scientists and scholars of the past to the technology of today's petroleum exploration, production and transportation, set against the background of the natural history of Saudi Arabia. **Dhahran, Saudi Arabia.**

Information is correct at press time, but please reconfirm dates and times before traveling. Most institutions listed have further information available on the World Wide Web, and our Web site, saudiaramcoworld.com, contains more extensive listings. Readers are welcome to submit information for possible inclusion in this listing.

**Flowing Robes:** Saudi Arabian Dress displays several late-19th-century sets of clothing and footwear for men and women, and a wide selection of 20th–century traditional garments from all four of the Kingdom's main geographical and cultural regions, which reflect the various economic and cultural influences on Saudi Arabia. The exhibition also includes traditional silver jewelry and daggers. ⓘ textile@rmv.nl or geke@rmv.nl. National Museum of Ethnology, **Leiden, The Netherlands,** October 2006 through January 2007.

**The gold and silver embroidery down the front of these festival *thawbs* from central Saudi Arabia includes the national emblem of crossed swords and palm tree.**

TEXTILE RESEARCH CENTER AND NATIONAL MUSEUM OF ETHNOLOGY, LEIDEN




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