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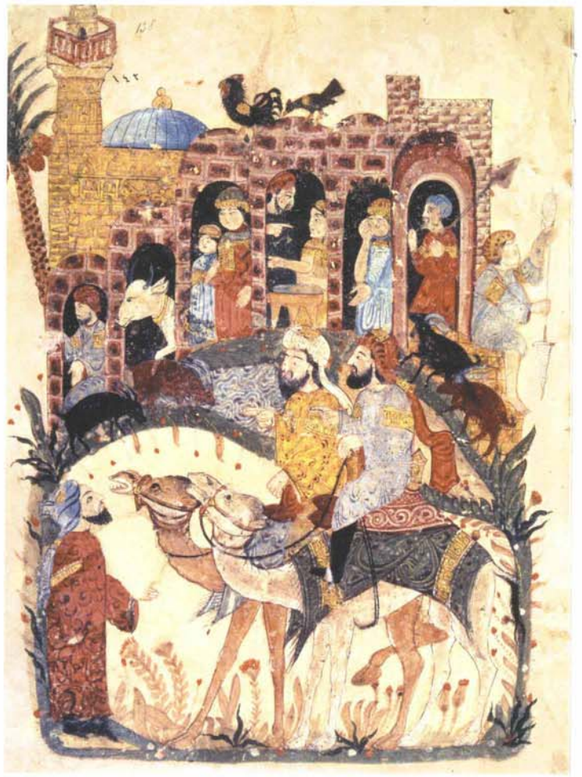

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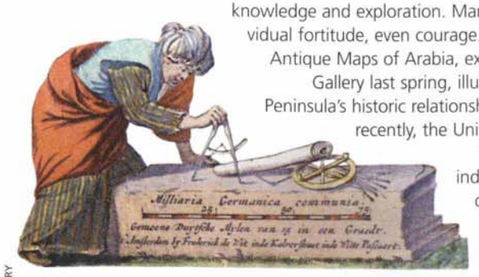
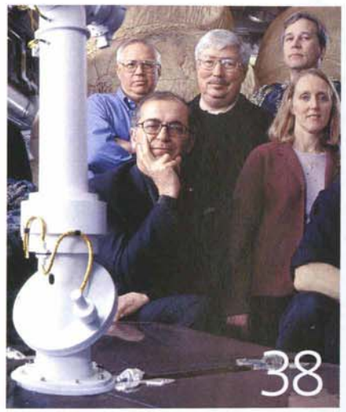
Mapping Arabia 20

Written by James V. Parry
Maps courtesy of the Bukhari Collection of Antique Maps of Arabia

Works of science, art and occasionally imagination, European maps of the Arabian Peninsula from the 15th to the 20th centuries underpinned commerce, politics, knowledge and exploration. Many were the results of individual fortitude, even courage. The Bukhari Collection of Antique Maps of Arabia, exhibited at London's Brunei Gallery last spring, illuminates anew the Arabian Peninsula's historic relationship with Europe and, more recently, the United States—and highlights the significance of today's independent local production of the most modern of the region's maps.

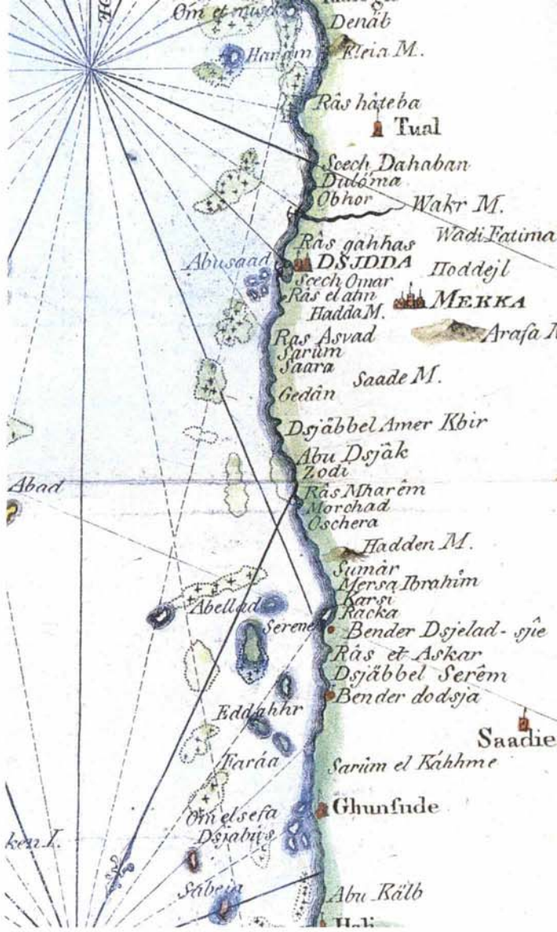




Lebanon, Pasadena—Mars

Written by Pat McDonnell Twair

At the helm of the *Spirit* and *Opportunity* robot missions to Mars, the comet-sampling *Stardust* and the *Cassini* mission to Saturn, Jet Propulsion Laboratory director Charles Elachi (at center) is the youngest in a historic lineage of scientists of Arab origin who have expanded knowledge of our universe.



Cover:

That European maps of the Arabian Peninsula drawn during the Age of Discovery were based on the accounts of mariners shows in a 1616 map by Dutch cartographer Pieter Bertius. The contour and coastal features, which the map's sources likely knew from experience, are reasonably accurate, but the interior towns and landforms, knowledge of which came to the mariners only through tales heard in ports, are approximate or fancifully decorative. Map courtesy of the Bukhari Collection of Antique Maps of Arabia.

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JOURNEYS OF FAITH, ROADS OF CIVILIZATION

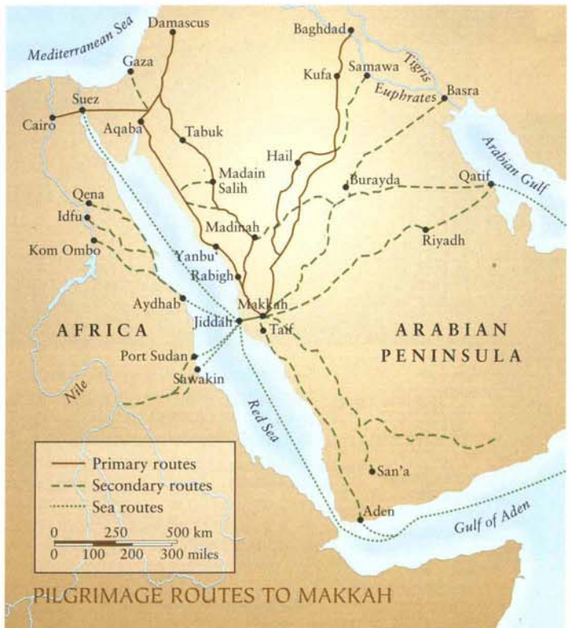
Written by David W. Tschanz

ROPED FOUR ABREAST, THE COLUMN OF CAMELS SHUFFLED IN THE DARKNESS ACROSS THE ROCKY PLAIN, EACH FOLLOWING THE SHADOWY FORMS OF THE FOUR IN FRONT. THE DRIVERS AND PASSENGERS INTERMITTENTLY DOZED IN THE SADDLE, THEN JERKED AWAKE, THEN DOZED AGAIN. FROM A DISTANCE THE SWEEPING TRAIN WAS MARKED BY THE SWAYING OF LANTERNS AND THE FAINT ACCOMPANIMENT OF TAMBOURINES.

IN THE EAST THE SKY LIGHTENED, MARKING THE CARAVAN'S 40TH MORNING, NOW IN A LANDSCAPE SHAPED BY VOLCANIC UPHEAVALS. AS THE SUN ROSE, SO DID THE TEMPERATURE. CAMELS GURGLED, BRAYED, BALKED AND STRODE ON, AS TIRED AS THE PILGRIMS RIDING THEM AND THE HARDY ONES ON FOOT, ALL STOLIDLY GOING ON AT THE INSISTENT COMMAND OF THE CARAVAN LEADERS.

IT WAS A SHARP-EYED CAMEL BOY AT THE HEAD OF THE COLUMN WHO FIRST SPOTTED THE TINY SMUDGE ON THE HORIZON, APPEARING, THEN DISAPPEARING IN THE SHIMMERING LIGHT. PUSHING TOWARD IT, THE CARAVAN MOVED ONTO THE FLOOR OF A SMALL VALLEY, THEN FORCED ITS WAY UP A STEEP RIDGE AND STOPPED. EVERYONE LOOKED, THEIR GAZES AWASH WITH EMOTION BORN OF A LIFETIME OF FAITH AND MONTHS, EVEN YEARS, OF TRAVEL. IN THE VALLEY OF ABRAHAM NOT FAR OFF, ITS WHITEWASHED HOUSES GLISTENING IN A LITTLE ISLAND OF GREEN, WAS THE REALIZATION OF THE PILGRIMS' EXTRAORDINARY EXERTIONS: MAKKAH, THE CITY OF GOD.

The Hajj, as the pilgrimage to Makkah is called in Arabic, is the fifth and final pillar of Islam. Performing it at least once is required of every Muslim who is able. A deeply spiritual event, it underscores the historical continuity of Islam's 14 centuries. By returning to pray at the site of the Ka'bah, and by commemorating in the rites of the *'Id al-Adha* Abraham's willingness to sacrifice his son at God's command, Muslims annually reinforce the links that bind them to each other, to the Prophet Muhammad and to the beginnings of monotheism.



PILGRIMAGE ROUTES TO MAKKAH

From Islam's earliest years in the seventh century, the desire to perform the Hajj set large numbers of people traveling to Makkah, the heart of Islam, and to Madinah, the city where the first Muslim community formed and where the Prophet Muhammad is buried. As a result, certain existing trade roads took on new importance and new routes developed that crisscrossed the Muslim world. To ease the pilgrims' journey, and for the sake of reward in the hereafter, rulers and wealthy patrons built caravanserais, supplied water and provided protection along these roads to Makkah and Madinah. Individual Muslims, in the name of charity, helped others to

PHOTOS12 / BIBLIOTHÈQUE NATIONALE DE FRANCE

make the journey, and giving to poor pilgrims was considered a pious act.

So beyond what each pilgrim's Hajj meant to him or her spiritually, the Hajj took on great importance as a social phenomenon, contributing enormously to forging a melded Islamic culture and a worldwide Islamic community whose shared characteristics bridged differences of nationality, ethnicity and custom.

Over the centuries, the padding of human and animal feet and the muffled sounds of their caravans were heard through every valley, village and mosque from the Atlantic shores of Africa and the Iberian Peninsula to the Pacific coast of China, from Zanzibar in the south to the Caucasus and Central Asia in the north. The stream of pilgrims passed even the most out-of-the-way corner of the *Dar al-Islam* (the Islamic world), and everywhere everyone knew someone who had been on the Hajj. Each passing pilgrim was a tangible reminder of the scope of the faith and the reach of the culture.

Hajj was the heartbeat of the Earth's first genuinely transcontinental culture. The Dar al-Islam, for nearly a millennium, was a composite Afro-Eurasian free-trade zone through which not only pilgrims but also traders, merchants and bureaucrats traveled with relative freedom and ease. By creating and nurturing this commons, the Hajj expanded the possibilities of science, commerce, politics and religion.

Pilgrims quickly discovered that, within the vast network of the Hajj, they were never really outsiders. Music, dress and accent could change a dozen times between Tangier and Delhi or between Samarkand and Makkah, yet the calendar, etiquette and much of human behavior remained almost identical. Everywhere Muslims prayed five times at the same times each day facing Makkah, everywhere they fasted together during Ramadan, everywhere they joined the pilgrims in sacrificing an animal at the end of the Hajj rituals, everywhere they practiced hospitality, and everywhere they drew their laws from the Qur'an. Commerce was supported by the system of caravan and sea routes. The closer one got to Makkah, the more the Hajj roads were the main arteries of this system, swelling with pilgrims from all points of the compass. No traveler came to the Holy Cities empty-handed, for some carried goods to pay their way, others bore local news that they carried among the provinces, and more learned ones brought the latest concepts and ideas, essential nutrients for the intellectual life of the Dar al-Islam.

The Hajj likewise affected many who were not on the road. The desire to assist the pilgrim's orientation, observation and movements spurred Muslim advances in mathematics, optics, astronomy, navigation, transportation, geography, education, medicine, finance, culture and even politics. The constant flow of pilgrims turned the trails into channels of cultural and intellectual ferment.

To go on the Hajj during the first 13 centuries of Islam required far more than booking a flight through a travel agent. It was an extraordinarily long and difficult marathon across often unforgiving terrain, and an individual's travel could take years or even decades if he had to stop en route to work and save before setting out again. The land routes were often littered with the remains of caravans ravaged by raiding tribes, stricken by disease, short of water or just plain lost, and every seafaring pilgrim knew that the sea had swallowed many a boat. The risks often taxed pilgrims to their limits, but this did little to inhibit the remarkably steady flow of the Hajj. It outlasted empires and persisted through war, famines and plagues. The journeys of the past inspired Muslims for centuries and provided images and experiences of real sacrifice, absolute faith and exaltation. The Hajj—or more precisely, the pilgrims, the caravans and the routes that comprised it—became the glue binding together the whole of Islamic civilization. The journey to Makkah has always been more than just the destination.

Paintings by one or more anonymous artists appear in *The Maqamat (The Assemblies)* of al-Hariri, a collection of stories and poetry that the author wrote in Baghdad near the beginning of the 12th century. It was recopied many times, and the paintings date from the early 13th century. On the previous page, a group of pilgrims sets off toward the Holy Cities. Above: Two of *The Maqamat*'s characters, al-Harith and the narrator and traveler Abu Zayd, bid each other farewell before the pilgrimage. Opposite: An old man and a young man of modest means take their rest in front of the fine tents of wealthy pilgrims.

MOST PILGRIMS EXPERIENCED TWO SEGMENTS OF CARAVAN TRAVEL. THE FIRST WAS THE JOURNEY BETWEEN HOME AND ONE OF THE THREE GREAT MARSHALING POINTS AT BAGHDAD, CAIRO OR DAMASCUS. FROM THERE, THE SECOND SEGMENT WAS THE FORMAL, ANNUAL HAJJ CARAVAN TO MAKKAH AND MADINAH.

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Caravan travel is probably as old as civilization. Most pilgrims experienced two segments of it, the first, the journey between home and one of the three great marshaling points at Baghdad, Cairo or Damascus. From there, the second segment was the formal, annual Hajj caravan to Makkah.

To reach the marshaling points, some came by boat, braving the waters of the Red, Black, Mediterranean or Arabian Seas, as well as the Arabian Gulf and the Indian Ocean. The vast majority, however, spent months slowly crossing great tracts of land. Pilgrimage from lands such as Indonesia or Morocco could entail round-trip journeys of 16,000 kilometers (10,000 mi) or more. In the 14th century, it took Ibn Battuta nine months to traverse just the northern coast of Africa, from Tangier to Cairo.

I HAVE ESTIMATED THE PACE OF THE HIJAZI CAMEL, LADEN AND WALKING IN CARAVAN LINE, UNDER ORDINARY CIRCUMSTANCES, AT TWO GEOGRAPHICAL MILES AN HOUR. A SANDY PLAIN OR ROCKY PASS MIGHT MAKE A DIFFERENCE OF HALF AN HOUR EACH WAY, BUT NOT MORE.

—Richard Burton, 1893

Some part of the distance and duration was by design. Some outlying Hajj roads do not follow the shortest distance between two points, but were intended to allow the pilgrim to visit mosques and holy places along the way to Makkah. For the pilgrim, the Hajj was not merely a religious duty, but also a process of personal renewal and growth.

Pilgrims carried the provisions they needed. The inbound caravans were well-supplied if the person traveling were rich, but the poor often ran short, and they often interrupted their journeys to work, save up their earnings and continue.

Until about 1930, when King 'Abd al-'Aziz Al Sa'ud brought the tribes of Arabia under one flag, the pilgrims' danger was greater the nearer they came to the Holy Cities. The climate was harshest in the Hijaz, where water was at its scarcest and banditry by tribes who made a living on caravans of all sorts was at its most rampant. Together, these factors made joining one of the major caravans a virtual necessity, and protecting those caravans became a major responsibility of the ruling power of the time. Failure to assure the security of the Hajj caravan was seen as a tacit abdication of political legitimacy.

Although some pilgrims always came to Makkah by sea, through the port of Jiddah, their numbers were far less significant than overland travelers' until the 19th century. Likewise, while there were also northbound caravans from Yemen, their numbers too paled by comparison with the great caravans from Damascus, Cairo and Baghdad.

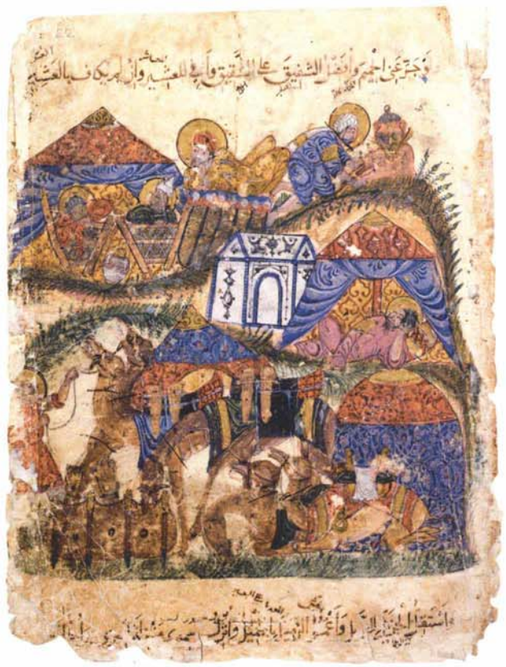
How many people made the Hajj each year? Reliable numbers are hard to come by, but the best estimates suggest that some 40,000 persons attended each year until the coming of steamship, rail and air travel. The size of a major Hajj caravan was typically reported by a variety of sources as numbering between 5000 and 8000 pilgrims, a number that gradually grew toward 10,000 by the end of the 19th century. In addition there were an unspecified number of merchants, soldiers, officials and others who took advantage of the relative security of the Hajj caravan to travel to and from the Hijaz and the ports of the Red Sea. Each caravan thus required about 25,000 to 30,000 camels, which had to be gathered each year outside Damascus, Cairo and Baghdad. The supply of these camels was a key economic and logistical factor both for the state, which operated the caravan and its support system, and for the individual pilgrims.

Each person was responsible for paying for his animal, supplies and expenses. Poorer pilgrims were often given their mounts and were assisted with expenses either by the government or as an act of charity by another person. The total cost was substantial. Official Ottoman registers from 1750 show that the fee from Damascus to Makkah was 70 piasters: 40 for food and transport; five for a place in the two-sided litter atop the camel; 15 for luggage (there was a weight allowance of 57 kilograms [126 lbs]); five for water; and five for the camel driver. The return trip cost 110 piasters because of the greater weight of goods being brought back and the consequently greater danger of attack. To put the cost in perspective, the annual salary of the imam of Damascus's Great Mosque was 20 piasters, and 200 piasters was more than enough to buy an average-sized house in that city.

The Ottoman *terke defteri*, which catalogued the possessions of pilgrims who had died en route, shows that most pilgrims traveled simply. One typical example is Mehmet Ağa, a Cretan landowner who died on the 1705 caravan. His possessions included a fur-lined cloak (his most expensive article of clothing), two other outer wraps, two shirts, a pair of boots, a coverlet and a napkin. His other equipment consisted of a small basin, four platters, two plates and a drinking cup. He also carried with him a kind of cardboard desk, writing implements and a basket.

The caravans were highly organized, and social historians note that their logistical feats indicate a high degree of sophistication from the earliest times. An annually appointed leader, the *amir al-hajj*—in some instances the caliph himself or a governor—oversaw a collection of high officials, who in turn governed a complex, mobile pilgrim-service industry of cameleers, medics, water carriers, torchbearers, cooks, scouts, guides and soldiers. Those who worked the caravans often did so year-round: Preparations would take six to eight months, with another three months being devoted to the round trip.

The amir al-hajj set the order of march and, en route, his word was absolute. No one could change position or drop out without his permission.



Above: At a rest stop along the route, pilgrims sleep in tents, care for their mounts and arrange their gear.
Opposite: Travelers rest in a caravanserai, traditionally designed with a large courtyard for stock and equipment overlooked by an arcade, off which lay small bedrooms.

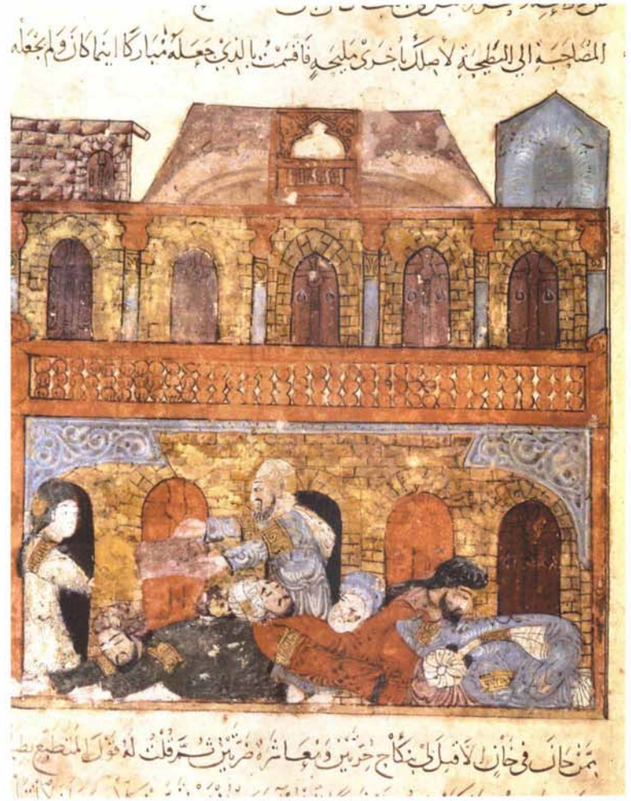
In accordance with the Qur'anic recommendation, the caravan typically departed on a Friday immediately after the noon prayer. By tradition, it was preceded by an unladen donkey, either for luck or for guidance. The camels were roped head-to-tail in strings of about 50, and the lead camel was decorated with parti-colored trappings, tassels and bells. Normally one third of the soldiers preceded the column, another third rode in the middle and the final third served as the rear guard.

The first day's march, being mostly a shakedown, typically did little more than clear the starting point and get below the horizon. Travel times differed slightly by season and terrain, but normally each day's travel was broken into sections. The first marching sequence ran from about two or three a.m. to ten a.m., followed by a rest period lasting until two or three p.m. The second march ran until about seven or eight p.m., followed by a rest until two a.m. This meant about 12 hours of travel each day, at a speed a bit more than three kilometers per hour (about 2 mph). The caravan arranged for several rest stops of two to four days' duration at prearranged locations where abundant water was available. While the caravan was on its way, the five daily prayers were often combined and performed at times that best coincided with the regular and necessary halts, a practice authorized by Muslim tradition.

Despite the sacred nature of the journey and the increased safety and security of a large caravan, each pilgrim needed nonetheless to have his wits about him. These were still mortal affairs rife with risk. Ibn Jubayr, laconic but observant, wrote in 1183 or 1184 of the "many hells that strew the road to Makkah." Some pilgrims perished along the way—it has long been considered a blessing to pass from this life while undertaking the Hajj—and some undertook the journey knowing that death, from disease or old age, was imminent. Others died in less timely ways, from exposure, thirst, flash flood, disease or attack. In 1361, 100 Syrian pilgrims died of cold, and in 1430 some 3000 Egyptians died of heat and thirst. In 1757 virtually the entire Damascus caravan was lost to attack by raiders, a failure of state protection that cost the Ottoman governor of Damascus not only his office but his life.

The soldiers who accompanied the caravans were useless against the elements and disease, but they served as a deterrent to marauders who waited along the roads. The raiders were no quaint medieval threat: As recently as World War I, the lion's share of subsidies from Istanbul and London went to buying off the more predatory tribes in order to keep the land routes open for commerce and faith. Protection of the caravans was a major concern of the Ottomans, who became responsible for both the Egyptian and the Syrian caravans after taking Egypt from the Mamluks in 1517. In budgetary terms, protection of the Hajj caravans was equivalent to waging a large annual war.

While troops reduced the threat of raids, pilgrims were not immune to other forms of extortion, legal and otherwise. To everyone along the way, pilgrims were a potential source of income: To rulers, they were occasionally special taxpayers; to the keepers of city gates or bridges, they were toll payers; and to every entrepreneur and merchant along the way, they were potential customers. While direct taxes on pilgrims were generally illegal, taxes on their possessions or their camels were not, and in the towns merchants and shopkeepers increased their prices for items in demand by pilgrims, creating one more hazard of the road.



WHENEVER THE CARAVAN HALTED FOOD WAS COOKED IN GREAT BRASS CAULDRONS, CALLED *DASTS*, AND SUPPLIED FROM THEM TO THE POORER PILGRIMS AND THOSE WHO HAD NO PROVISIONS. WITH THE CARAVAN WAS ALSO A NUMBER OF SPARE CAMELS FOR THE CARRIAGE OF THOSE UNABLE TO WALK.... THIS CARAVAN CONTAINED ALSO BUSTLING BAZAARS AND GREAT SUPPLIES OF LUXURIES AND ALL KINDS OF FOOD AND FRUIT. THEY USED TO MARCH DURING THE NIGHT AND LIGHT TORCHES IN FRONT OF THE FILE OF CAMELS AND LITTERS, SO THAT YOU SAW THE COUNTRYSIDE GLEAMING WITH LIGHT AND THE DARKNESS TURNED INTO RADIANT DAY.

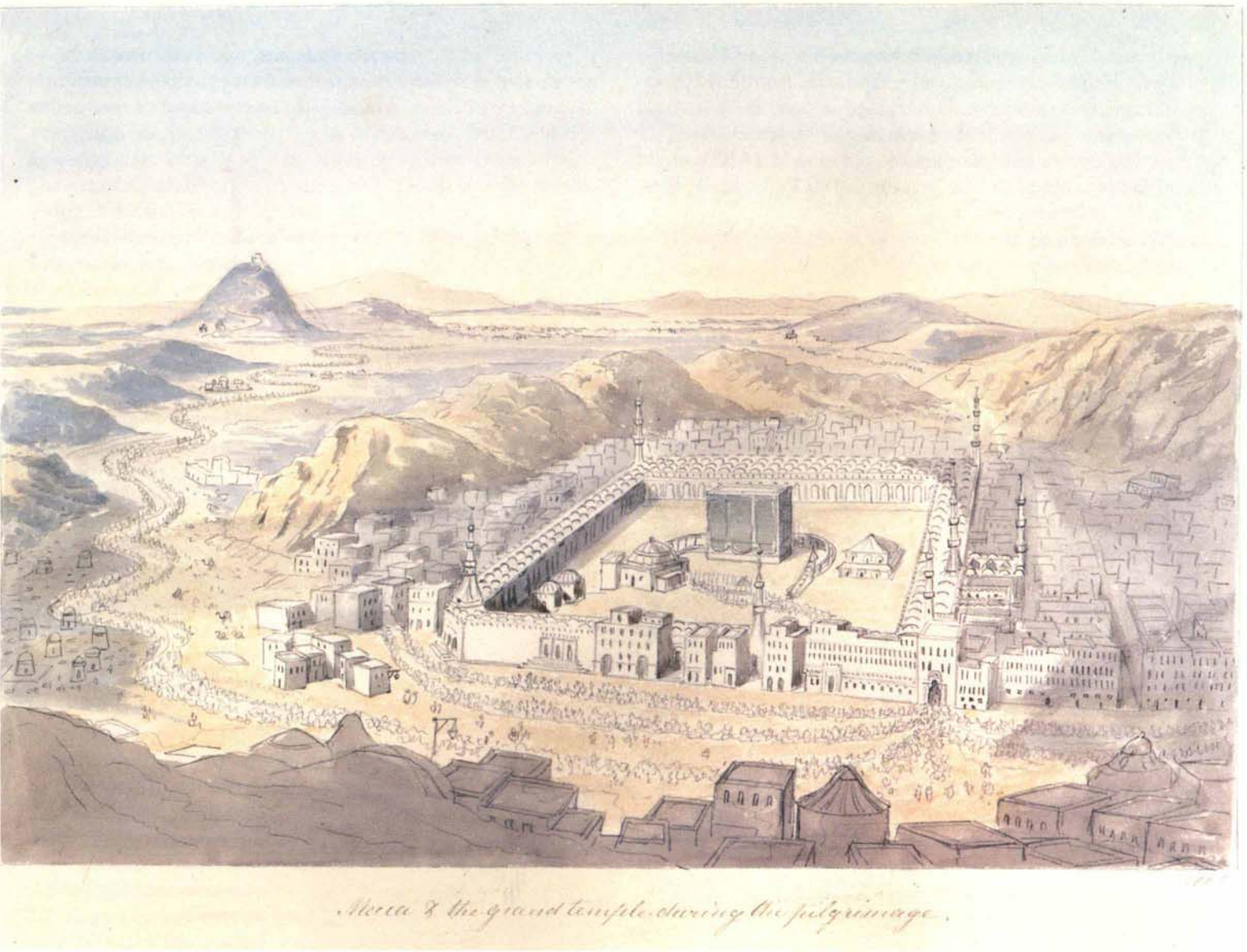
—*Ibn Battuta*

This was the commercial side of the Hajj, which economically was a kind of annual fair and transcontinental merchandising opportunity. Ever candid, Ibn Jubayr observed, "Not all go to Makkah out of devotion, and there are a number of people who make the pilgrimage only from hope for gain." Others fell somewhere in between, for it was common for a pilgrim to partially finance his Hajj expenses by becoming a trader along the way. On the roads, in the ports and in the Holy Cities there was always something to buy and sell.

The merchants of Damascus and particularly Cairo used the relative security of the Hajj caravans not only to sell at retail to the pilgrims, but also to transport funds and goods wholesale to Makkah. Additionally, the merchants would meet in the Red Sea ports with agents from India, China, Southeast Asia and elsewhere. The caravans would bring European textiles, foodstuffs and a notable amount of coinage and return laden with spices, drugs, coffee and Indian textiles. Returning pilgrims were often weighed down with various objects of piety such as prayer beads, often in such large quantities as to suggest the intention of resale to the folks back home.

This all affected culture. A Tajik from Central Asia, for instance, might bring a rug to sell in Makkah, which might

THE MERCHANTS OF DAMASCUS AND CAIRO USED THE SECURITY OF THE HAJJ CARAVANS NOT ONLY TO SELL AT RETAIL TO PILGRIMS, BUT ALSO TO TRANSPORT GOODS IN BULK TO AND FROM THE HOLY CITIES. IN JIDDAH, THEY MET AND DEALT WITH THEIR COUNTERPARTS FROM INDIA, CHINA, SOUTHEAST ASIA AND ELSEWHERE.



Mecca & the grand temple during the pilgrimage

Top: **A view of Makkah in the early 19th century by Charles Hamilton Smith, an English officer and artist who is not known to have visited the Arabian Peninsula and who thus probably drew this from other sources.** Opposite: **Pilgrims pray at the Ka'bah in the Great Mosque in Makkah. The painting, dated 1442, is by the Persian artist Bihzad, who created it as part of an edition of the *Khamsa* of Nizami.**

ART RESOURCE / CHARLES HAMILTON SMITH / VICTORIA AND ALBERT MUSEUM, LONDON

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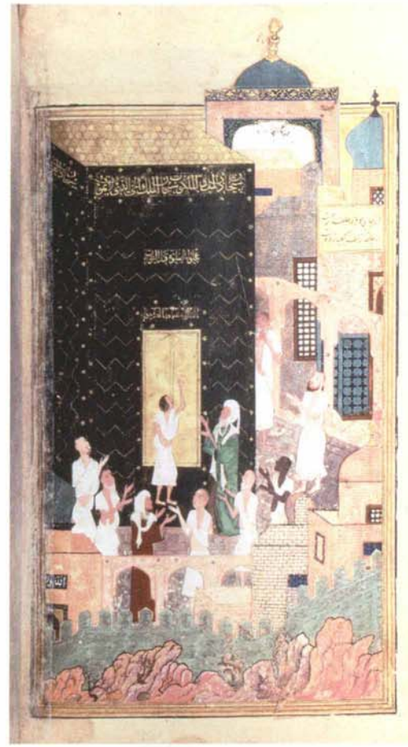
be bought by a North African pilgrim and transported back to Morocco. There, weavers could inspect and perhaps copy the workmanship and design of a craftsman thousands of miles away. Styles and techniques in art forms as diverse as leatherworking, calligraphy and ceramics were similarly disseminated along the routes of the Hajj.

Religious, scientific and literary manuscripts similarly changed hands along the same paths. With Arabic serving as a lingua franca throughout the Muslim world, the Hajj was no less an intellectual clearing-house. The Holy Cities were for centuries centers for some of Islam's great thinkers, who traveled there to perform the Hajj and then stayed on to study with the best and brightest. Provincial scholars, judges, lawyers, teachers, businessmen and traders from every corner of the earth shuttled almost routinely among North Africa, Egypt, Persia, India and Indonesia. The certificates of learning that Ibn Battuta earned in Makkah, for example, qualified him to land posts as a *qadi*, or judge, in Delhi, the Maldives and Indonesia, far from his native Tangier. Today's Bangladeshis working in Silicon Valley or Saudi families thriving in Japan would hardly have surprised the people who took to the Hajj roads.

The Hajj was in effect a traveling university, as significant to the wider *'ummah*, or community of Islam, as any of its fixed institutions of education, culture and creativity. Some pilgrims—such as Ibn Battuta, Ibn 'Arabi and Ahmad ibn Idris—became lifelong wanderers along the Hajj roads, returning several times to Makkah and Madinah to feed on and draw from the environment of passionate intellectual striving, then returning once again to the wider arcs of the Islamic world.

The end of the Hajj caravans came surprisingly fast. It took a mere 75 years for steamships, trains, buses and aircraft to render obsolete the pilgrimage routes that had endured for nearly 13 centuries. In the late 19th century, particularly after the opening of the Suez Canal, increasing numbers of pilgrims journeyed to Makkah by ship via Yanbu' or Jiddah. Not only Egyptians took to the sea, but Syrians and Anatolians sailed from Beirut through the canal, and ever-increasing numbers of Indian and Indonesian pilgrims arrived across the Indian Ocean. The 1908 opening of the Hijaz Railway from Damascus to Jiddah sounded the death knell of the Damascus caravan. After World War II, the route to Makkah was marked out increasingly by air, until by the 1990's fully 95 percent of non-Saudi pilgrims (and more than a few of the Saudi ones) arrived on chartered or commercial aircraft. The remaining handful of overland pilgrims, mostly from Middle Eastern countries adjoining Saudi Arabia, traveled high-speed highways in air-conditioned buses.

The new modes of transport also brought an exponential increase in the numbers of pilgrims altogether. According to the Saudi Press Agency, the number of pilgrims who made the Hajj was fewer than 100,000 as recently as 1950. That number doubled by 1955, and in 1972 it had reached 645,000. In 1983 the number of pilgrims coming from abroad exceeded one million for the first time, and since the 1990's the numbers have exceeded two million. With this, the experience of the Hajj changed dramatically. To future historians and writers is left the task of assessing the impact of these changes on the world of Islam.



A TRIBE FROM YEMEN, THE SARU, MAKE A TRADITION OF ARRIVING 10 DAYS BEFORE WITH THE DOUBLE PURPOSE OF PERFORMING THE HAJJ ON THE ONE HAND AND OF PROVIDING MAKKAH ON THE OTHER WITH WHEAT, GRAINS, KIDNEY BEANS AND OTHER COARSE PRODUCTS, BRINGING BUTTER, HONEY, RAISINS, ALMONDS, CONDIMENTS AND FRUIT. THIS YEAR THEY ARRIVED BY THE THOUSANDS, MEN AND CAMELS LADEN WITH GOODS AND BRINGING AN ABUNDANCE OF SUPPLIES TO THE BLESSED CITY AND TO THE PILGRIMS THAT HAVE SETTLED HERE.

—Ibn Jubayr, 1183/1184

THE DAMASCUS CARAVAN

With the longest continuous history of any of the Hajj caravans, the Damascus caravan was also the best known and the largest. Its roots stretch back to the Umayyad caliphate in the seventh century. Under the Mamluks and then the Ottomans, it was led by the governor of Syria. It also generally included the most foreigners, which swelled to include Iranians and Iraqis brought north by the loss of the Baghdad-based route in the 13th century. The distance from Damascus to Madinah was about 1300 kilometers (800 mi), and the caravan normally covered it in 45 to 60 days.

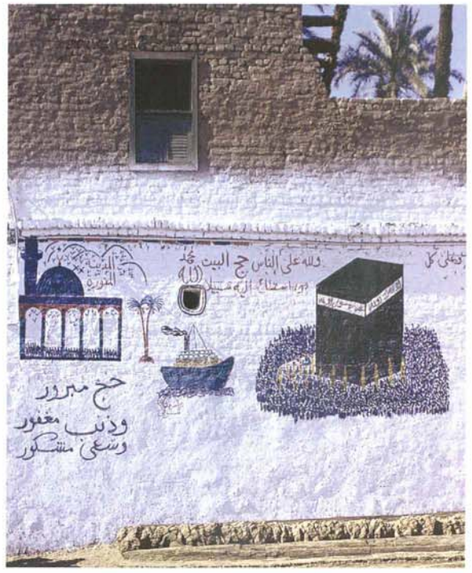
Generally the camels for this caravan were supplied by villages in southern Syria and tribes on the Syrian steppe around Palmyra. They were delivered at Muzaryib, the caravan's chief staging point, about three days' journey south of the capital. The best records of the caravan are from the Ottoman era starting in the 1450's, though many of the traditions would date back to the Mamluks and even earlier. The caravan was further accompanied by the *sürre amir*, or "guardian of the purse," an imperial officer from the Ottoman court in Istanbul.

From Muzaryib, the route ran across the fertile plains of Hauran, past the territory of the Druze people and over the rolling hills towards Roman Jerash. The flat stretch from Amman to Kerak to Ma'an traversed the "brow of Syria," an elevated plateau between the desert proper to the east and the hilly spine of the Rift Valley to the west. After a four-day stop near Kerak, the caravan would pass through Ma'an and make its way east into the desert through the Pass of al-Sawan and south through Dhat al-Hajj and Wadi Balduh to Tabuk, where the pilgrims would stop for another four days. Continuing across the desert, the caravan pushed on to al-'Ukhaydir, then Hijr (Madain Salih), al-'Ula and finally Madinah and Makkah. (If the caravan was joining up with the Egyptian caravan, it would detour at Ma'an to Aqaba and move into the Hijaz from there.)

After the Hajj, a secondary caravan, called the *jurda*, was sent from Damascus to meet and support the returning caravan.

THE EGYPTIAN CARAVAN

Pilgrims from the Maghrib (northwestern Africa) and al-Andalus (Muslim Spain) would follow the land routes to Cairo. Like the Damascus caravan, the route from there took roughly 40 days, broken up into 34 stages, each some 45 to 50 kilometers (28–30 mi) long. The caravan would muster at Birkit al-Hajj ("Pilgrimage Well"), a village just north of Cairo. After about four days, it would proceed in no particular order to Ajrud, the formal marshaling ground northwest of Suez. There, under both the Mamluks and the Ottomans, a government-appointed amir al-hajj was placed in charge, responsible for organization, security and the caravan's on-time arrival at the Holy Cities.



One or two hours after sunrise on the day of departure, the caravan would form and proceed either south to Quzlum (Suez) or, more typically, directly east. Both routes met at Thughrat Hamid, and then crossed the Sinai through Qala'at al-Nakhl to the port of Aqaba, which marked the quarter-way point of the journey. From Aqaba, the pilgrims made their way to al-Bad', and then followed the coast to Rabigh. At Rabigh they joined the *Darb Sultani*, "The Sultan's Way," connecting Madinah and Makkah.

Starting in the 12th century, the Crusaders' occupation of a large swath of territory from Aqaba to Edessa effectively barred the Egyptian caravans from crossing the Sinai. (They also forced the Syrian caravans far out east into the desert.) In response, the Egyptian caravan turned south from Qus to the Red Sea port of Aydhab, where pilgrims were often packed onto overloaded ships to sail to Jiddah. Noting this as well as the extortionate prices Aydhabis charged for the 20-day voyage, historian Ibn Jubayr called the port "one of God's least-favored places."

This particular difficulty ended in 1266 with the end of the Crusader presence, the year the Mamluk Sultan Baybars sent the *kiswah*—the embroidered cover for the Ka'bah that is made anew annually—along with the Hajj caravan by the Sinai route. In addition to the main caravan, Cairo rulers organized a secondary caravan that was sent out three or four months before the main one, which allowed some pilgrims to spend a longer time in the Holy Cities to perform optional rites in a more leisurely fashion.

Above and opposite: **Two paintings from the walls of houses in the Egyptian town of Farafra celebrate the residents' recent pilgrimages—by ship and by air, respectively.**

THE BAGHDAD CARAVAN

From Iraq, the route to the Hijaz, as well as the pace a traveler had to keep up, was determined by the location of water sources. Scattered thinly over the 1500-kilometer (900-mi), trans-peninsular route, these sources had from time immemorial tenuously linked the two areas. Assyrian armies, Babylonian and Egyptian merchants and countless others had relied on them.

With the accession of the Abbasids to the caliphate in AD 749 and the transfer of the capital from Damascus to Baghdad the following year, there was new interest in facilitating the pilgrimage from Kufa and from Basra farther south. Unlike their predecessors, the Umayyads, the Abbasid rulers had a penchant for leading the Hajj in person, and they put huge sums not only into the route, but also into the expansion and adornment of the Holy Cities.

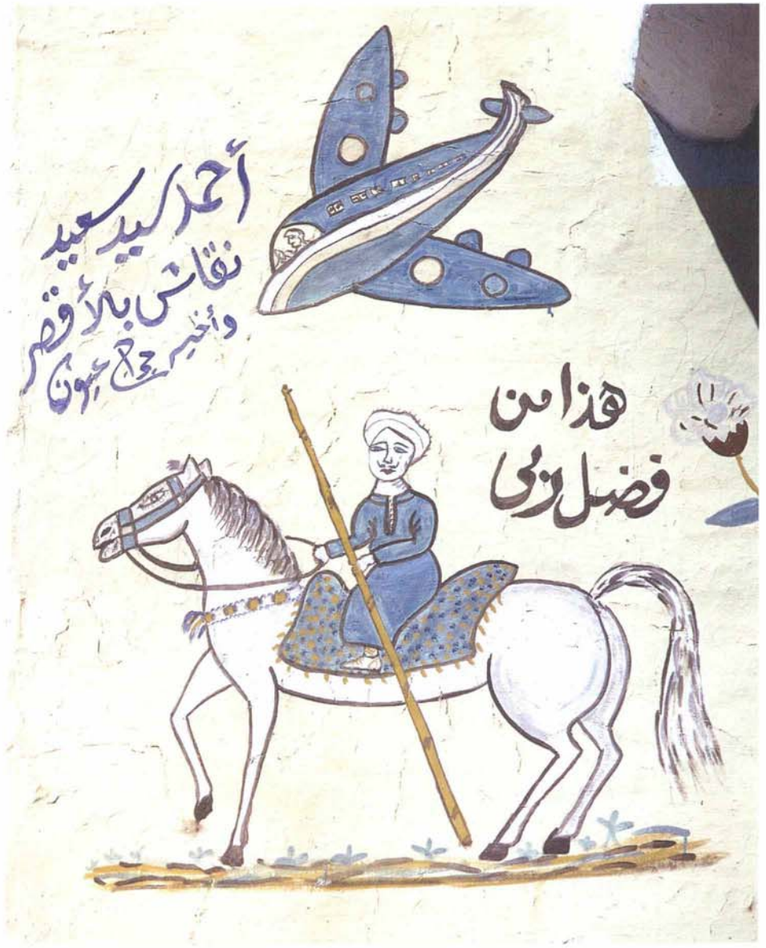
In 751, al-Saffah, the first Abbasid caliph, ordered fire signals and milestones established from Kufa to Makkah. His successor, Mansur, ordered additional forts built. Mansur's successor, al-Mahdi, undertook projects to clear and level the way. By 776, the passage could be made so quickly—at least under demonstration circumstances—that al-Mahdi had ice delivered to him in Makkah from Iraq.

The most generous patrons, however, were the storied caliph Harun al-Rashid, who ruled from 786 to 809, and his equally famous wife Zubayda. The caliph made the pilgrimage six or nine times, including the one in 790 which, in fulfillment of a vow, he made entirely on foot. His final one, performed in 804, was the last Hajj ever made by a caliph.

Zubayda made five or six pilgrimages herself, the first in the company of her husband in 790. Her name is attached to two notable projects: The first established abundant drinking water in Makkah, and the second built at least 10 new rest stops and three new way stations along the route, as well as a number of water tanks. Ever since, the route has been known as *Darb Zubayda* ("Zubayda's Way"). At its height, the route included milestones, 54 major way stations with cisterns, reservoirs or wells, fire signal towers, hostels and fortresses—all paid for by the Abbasid treasury.

The chief departure point for the Iraqi caravan was Kufa. Pilgrims starting from there crossed the Najd to Madinah, passing through Fayd just south of Hail. East of Madinah, the caravan would rest near al-Rabadha, where current archeology shows remains of large houses, fortified walls, watchtowers, mosques, pottery kilns, stone-working factories, jewelry shops and two large reservoirs.

A second and much smaller caravan, composed mostly of Iranians and others who did not wish to travel to Kufa, would set out from Basra following a more southerly route that passed through al-Hasa, then through al-Dir'iyya, which became the Saudi capital in the 18th century. The two groups would meet at Dhat Irq, complete the Hajj circuit and return together.



This route fell into disuse following the Mongol destruction of Baghdad in 1258. Cities such as al-Rabadha that had depended on the Hajj caravans were slowly abandoned. The Ottoman Turks showed little interest in reestablishing the route. Iraqi, Iranian and other pilgrims from the East took the longer but safer route via Damascus.

OTHER ROUTES

There were several lesser caravan routes. Some Iranians would journey from the lower Euphrates area of Suq al-Shayukh, in the neighborhood of Meshed Ali. East and Central Africans would make their ways to Darfur in Sudan, and then proceed as a group to Assiut, Aydhab and across the Red Sea to Jiddah. Another African caravan, primarily composed of Nubians, would cross the Red Sea at Kosseir and gather at Yanbu' for the march to Makkah. Indian and Malay pilgrims followed the sea routes, and they gathered after their voyages at Jiddah. From much closer to the Holy Cities, Arabs from Yemen to the south and the Najd to the east might form their own bands, often convening at Taif, near Makkah.

Each of the above caravans would have its own *amir* and its own guides or agents (*muqawwim*), whose business it was to see to provisions, water and the like. Given the lower economic status of most of these participants, they tended to move more quickly since, in the words of Ibn Battuta, they were "seldom encumbered with a numerous retinue of servants and other attendants." ⊕

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Related articles have appeared in these past issues of *Aramco World* and *Saudi Aramco World*:

Hajj: N/D 74; J/A 92; M/J 02

THE HAJJ WAS IN EFFECT A TRAVELING UNIVERSITY, AS SIGNIFICANT TO THE TRANSCONTINENTAL GROWTH OF EDUCATION, CULTURE AND CREATIVITY AS ANY OF ISLAM'S FIXED INSTITUTIONS OF LEARNING.

JOHN G. ROSS / ARAMCO WORLD / PADUA

GUARDIANS OF THE PILGRIM WELLS

Damascus to Aqaba

WRITTEN BY DAVID L. KENNEDY AND ANDREW PETERSEN
PHOTOGRAPHED BY DAVID L. KENNEDY

"I asked him of the road to Mecca and of the hardships that the pilgrims endure upon the way. 'By the Face of God, they suffer,' said he. 'Yet it is not the pilgrims that suffer most, but those that keep the forts that guard the water tanks along the road."

—*Gertrude Bell,* The Desert and the Sown, *1907*

Since the early 20th century, pilgrims to Makkah have sped to their destination in engine-powered vehicles. But for 13 centuries before that, they experienced very different conditions. Makkah lies in the heart of one of the most arid places on our planet, and the surrounding lands from which pilgrims journeyed were often nearly as harsh. Travel was hazardous and fraught with the risks of exhaustion, privation, illness, injury, scant or contaminated food and water, and attack. From the seventh century to the present day, Muslim states have done what they could—and some have gone to great lengths—to minimize these hardships. One way they did this was by offering pilgrims safe stopping places.

As the first Muslim rulers of the Middle East, the Umayyads established their capital at Damascus in the seventh century, making the *Darb al-Shami*, the "Northern Way," one of the earliest to be used for the Hajj. There were, of course, far older roads in the region that had been used for centuries by caravans traveling from Yemen in the south of the Arabian Peninsula to Damascus by way of Makkah, Madain Salih and Petra. The Mediterranean coast road was the Via Maris; east of the Jordan River, there was the King's Highway, which ran the length of the plateau; and farther east was the desert track, which provided the most direct route to Arabia from Damascus.

After the coming of Islam, as for centuries before, the choice of routes for the pilgrimage caravans was determined by considerations of geography and security. For long periods, raiders made the desert route unsafe, and pilgrims shifted westward to the King's Highway, which was guarded by fortresses at places like Kerak and Shawbak. But that route involved difficult crossings of the deep valleys that run laterally into the Dead Sea and the Rift Valley—places infamous, too, for their bandits.

Despite recent archeological hints of Roman or pre-Roman use of some of the sites along the desert road, the heyday of this route belongs to the Ottoman period, when it became the principal path both of the pilgrimage caravans and of Constantinople's communications with its distant Arabian province.

The attractions of the desert route included relatively flat terrain that allowed a swift 34-day journey from Damascus to Makkah. On the other hand, security was always a problem, and water was scarce—but these problems the state could help to solve. Between the 16th and 18th centuries, Ottoman sultans built—or in some cases refurbished—a series of 15 forts between Damascus and Aqaba whose primary function was the protection of the pilgrims' water supplies.

If there could be both water and security along the way, the relatively flat terrain of the desert route allowed a journey of only 34 days from Damascus to Makkah.

Dating from the 1570's, the interior of the fort at 'Unayza was typical: a single wall, a courtyard and a flight of stairs to the garrison's quarters. Opposite: An aerial view of the fort at Qatrana, built in 1559, shows its proximity to the now-dry reservoir.

Today, a few of these forts are in the middle of modern towns, but most of them stand alone in the desert. In the last five years, many have been repaired by Jordan's Department of Antiquities, and there is increased scholarly interest in them all.

The Ottoman legacy of the forts began when Süleyman I became sultan in 1520 and expanded Ottoman authority over vast areas that had not been unified under one ruler since the early Islamic period. Süleyman regarded it as his duty to ensure that, each year, the Hajj caravan traveled from Damascus to Makkah and returned again safely. He employed three measures to achieve this goal: an armed, mounted escort (*cerde*), payments to local tribes (*sürre*) and the construction of forts. Several of the forts can be dated by inscriptions or literary references, and their character can be explored archeologically.

In 1531 the first Ottoman fort along the Hajj road was built at 'Ukhaydhir. It was followed in 1559 by fortresses at Qatrana, Ma'an and Dhat al-Hajj. In the 1570's forts were built at 'Unayza and Hadiya. Three more forts were added in the 18th century, by which time the Bedouins had acquired firearms, which made them more dangerous than ever to the ponderous Hajj caravan. That fact probably explains the projecting corner towers of these later forts, whose defenders confronted different weapons. Regardless of design, however, all the forts stood within musket-shot of a water reservoir.

Their sizes and floor plans, too, are remarkably consistent: A square or rectangular outline measuring approximately 20 meters (65') on a side encloses a courtyard with a well or cistern and stairs leading to a single upper floor. Although this design has much in common with commercial *khans* or caravanserais, the forts were built to provide shelter not for the pilgrims but for officials and for the garrison, which averaged 20 men or fewer.

As pilgrims traveled from Damascus, the three principal features of the journey that they encountered were the route itself, the water supplies and the forts. In varying degrees all of those can still be seen today. The route is disappearing with the advance of agriculture and modern roads, but traces survive, and there are some bridges still visible. Most of the forts are well-preserved, and several have seen excavation in recent years and have revealed important information on the neglected Ottoman period and the extraordinary annual event of the Hajj.

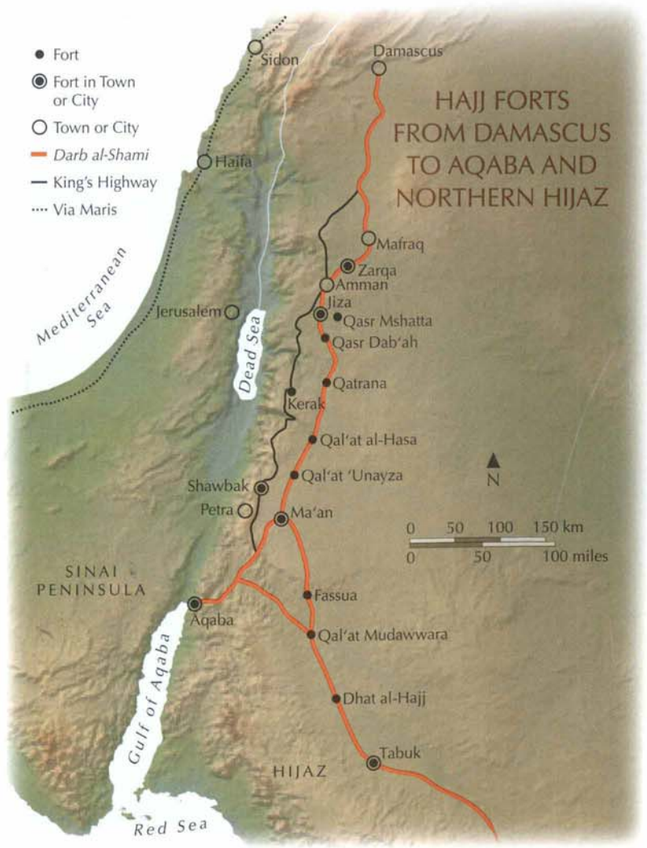
The Pilgrim Road, *Darb al-Shami*

1

The "road" was seldom more than a deeply worn, unsurfaced track that sprawled over a wide area. This is how Canon Tristram, author of *The Land of Moab*, saw it in 1872:

> We might have been galloping across a deeply ridged fallow. For about a quarter of a mile in width, every three or four yards was a deep wide rut, all in parallel lines. We were crossing the hadj road. Files of hundreds of camels, slowly following each other in the weary tramp to Makkah, had, in course of ages, worn the hard surface of the desert into these deep furrows.

Over 12 centuries, several million people followed the Darb al-Shami on foot, on camels, horses, mules or donkeys, or carried in a litter of some kind. In 1876, when Charles Doughty traveled with the Hajj through Jordan, he estimated that his caravan included up to 6000 people and 10,000 animals, often walking or riding in parallel columns. The photograph, which clearly bears out Tristram's description, was taken 131 years later near the area he described, between the forts of Mshatta and Dab'ah, in one of the few areas where the old Darb al-Shami has not been smoothed by modern agriculture.



Qasr Shabib

2

South from Damascus, one of the caravans' first stopping places was at Mafraq, which was also a stop on the 20th-century Hijaz Railway. Today Mafraq is a large town, but its fort was destroyed in the 1950's. It is thus at Zarqa, Jordan's second-largest city, that the first fort south of Damascus survives, an island in the midst of the city. It is a massive, compact tower, a single room with walls three meters (10') thick pierced by arrow slits. Outside are at least three cisterns. The famous Moroccan traveler Ibn Battuta visited it in the 14th century, and it seems to have been originally a Mamluk construction from the 14th century. It commanded a good view from its eminence beside the Wadi Zarqa.

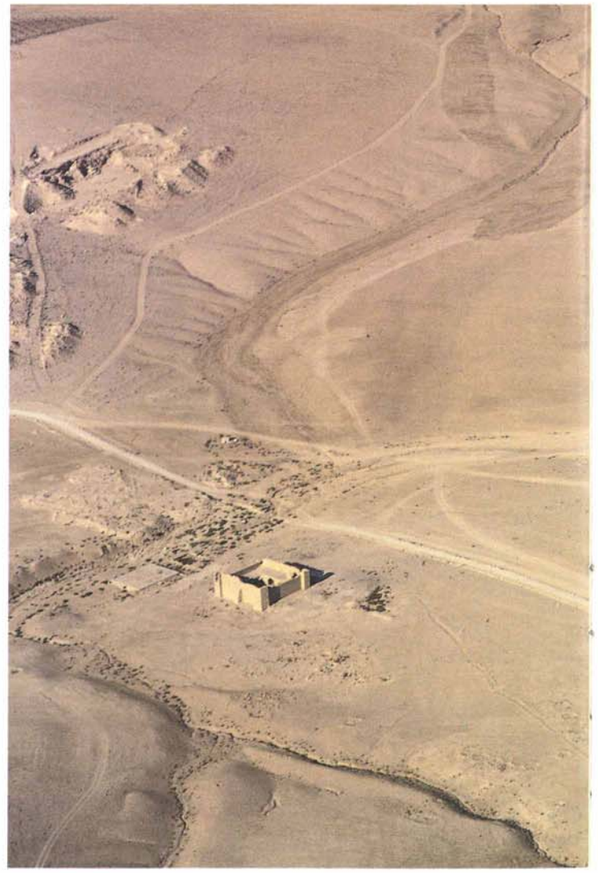
Jiza

3

From the earliest times, people had tackled the problem of desert water sources by tapping water in winter from natural seasonal watercourses (*wadis*) and storing it in deep, roofed cisterns or in open tanks. The system could be complex, including dams to divert the water, channels to carry it over distances and settling tanks to allow floodwater silt to sink before the clean water spilled over into the reservoir. The reservoir at Jiza was probably Roman if not Nabataean in origin and is the largest of any from the pre-industrial period in Jordan. It is still capable of holding some 68,000 cubic meters (18 million gal, 55 acre-feet) of water. This view looks southwest over Jordan's modern Route 25 with the reservoir in the center. The rectangular building on the high ground to its south is the Hajj fort described by Ibn Battuta in the 14th century. It was probably restored in 1569, when the reservoir was certainly extensively repaired, then devastated in 1833 by the troops of Ibrahim Pasha and rebuilt later in the 19th century. It became a post of the Arab Legion and, later, of the Jordanian army. The modern town overlies a considerable settlement from the Roman and early Islamic period.

Qasr Dab'ah

4



South of Amman, it seems the Darb al-Shami had alternative branch routes. One passed through Jiza, and another ran farther east through this remote site. The finely preserved doorway opens eastward, looking out over the fertile but dry "pre-desert" beyond.

To the north is a large reservoir, now roofed. This may be the *birka* (pool) recorded as constructed before the fort, during the reign of Sultan Selim I (1512–1520). The fort itself is 25 meters (81') square and has rooms arranged in two stories around a central courtyard. The square projecting towers, because they are reminiscent of Late Roman forts in this area, have led to the suggestion that this may be a reconstruction of an earlier Roman post. As it stands, however, we can infer some date in the 16th century for its construction—making it one of the oldest Hajj forts in Jordan—as well as repairs carried out in the 18th century. On the south side are traces of a cemetery.

Qal'at al-Hasa

5

The deep gash of the Wadi al-Hasa is one of the great obstacles for travel along the King's Highway, and it helps explain why a desert route, skirting around the wadi at its shallow eastern end, was favored. A glance at the photograph makes clear the significance of the forts, rare places offering security and water.

Until recently, the traveler approaching this lonely site from the north could cross the Wadi al-Hasa by a finely preserved and typical Ottoman bridge. Built by Aydınlı Abdullah Pasha between 1730 and 1733, its two main arches spanned 30 meters (97'). The paved road beyond, seven to 10 meters (22–32') wide and extending for 1.5 kilometers (nearly 1 mi), is made of flint cobbles set into square limestone panels. This is one of only two places on the Hajj route in Jordan where the road was actually paved, in this case to prevent the caravan's getting bogged down in the mud that inevitably formed each year after the winter rains. (The other paved section is near Qal'at Mudawwara in the south, where there are soft desert sands.)

The fort is almost 24 meters (78') square, and it has the typical central courtyard and well with two stories of rooms on each side. The entire north wall has collapsed in recent years, leaving only the vaulted entrance passageway standing until recent restoration. An inscription dates its construction to the reign of Sultan Mustafa III (1757–1774), making this the youngest of the Hajj forts in Jordan.

Coming in from the east is a channel carrying water from the wadi into the northeast corner of a reservoir. Two more channels lead from the well in the courtyard of the fort to the middle of the west side of the cistern.

When Charles Doughty visited in 1876, the fort was garrisoned by five soldiers, who lived there with their families.

Ma'an

6

The town is famous for its ancient remains stretching back to Nabataean, Roman and early Islamic times, and lies on a desert route whose use predates Islam. During the medieval period, Ma'an seems to have been bypassed in favor of a more southerly route via Aqaba, but in the 16th century the Ottomans revived the Ma'an route, built a fort in the middle of the town and renovated some of the old water systems.

Ma'an offered a different environment for the pilgrims, who there confronted mud-brick architecture and irrigated gardens resembling those in Arabia to the south: a veritable oasis, with springs and abundant precious water. In 1882, J. L. Burckhardt wrote in *Travels in Syria and Arabia Deserta*:

> The inhabitants cultivate figs, pomegranates and plums in large quantities but they do not sow their fields. They purchase their wheat from Karak, which their women grind: and at the passage of the Hadj they sell the flour as well as the fruits to the pilgrims....

Unsurprisingly, the pilgrims remained for two days at Qal'at Ma'an, a relief after the lonely route they had traveled from Syria.

The Ottoman fort, originally built in 1532, is the oldest dated Ottoman building in Jordan. For much of the 20th century, it was a jail, but today it is the local arts center. Immediately in front of the gateway, there is a large reservoir connected to a water channel more than 500 meters (1600') long.

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Andrew Petersen is an archeologist specializing in the Islamic Middle East. He is currently a research fellow at Cardiff University, Wales, and was formerly a research officer for the Amman-based Council for British Research in the Levant. He has specialized in research on Jordan's Hajj forts since 1986. His e-mail address is petersena@cardiff.ac.uk.

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Services to pilgrims: M/J 02
Ibn Battuta: J/A 00
Aqaba: M/A 00
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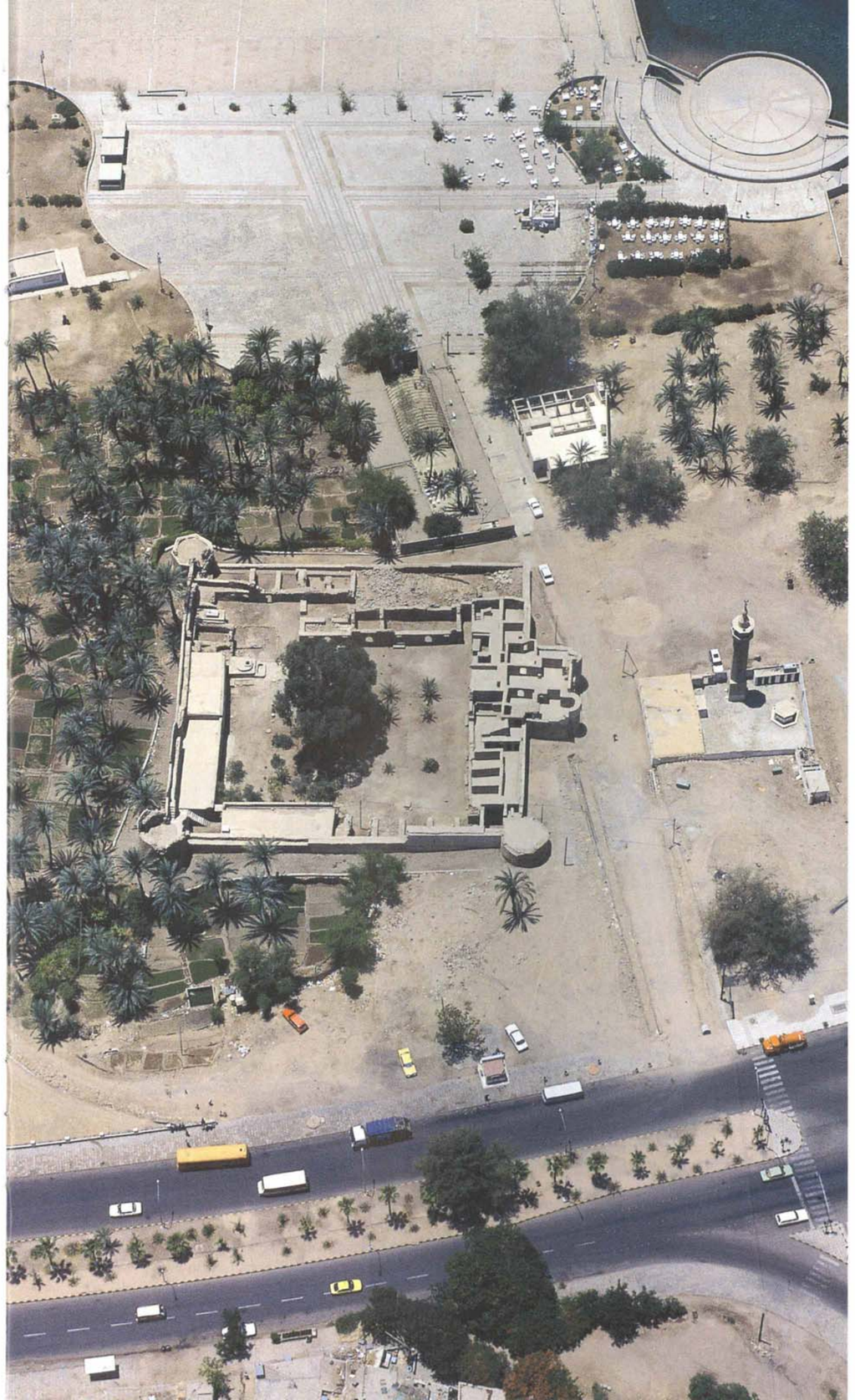
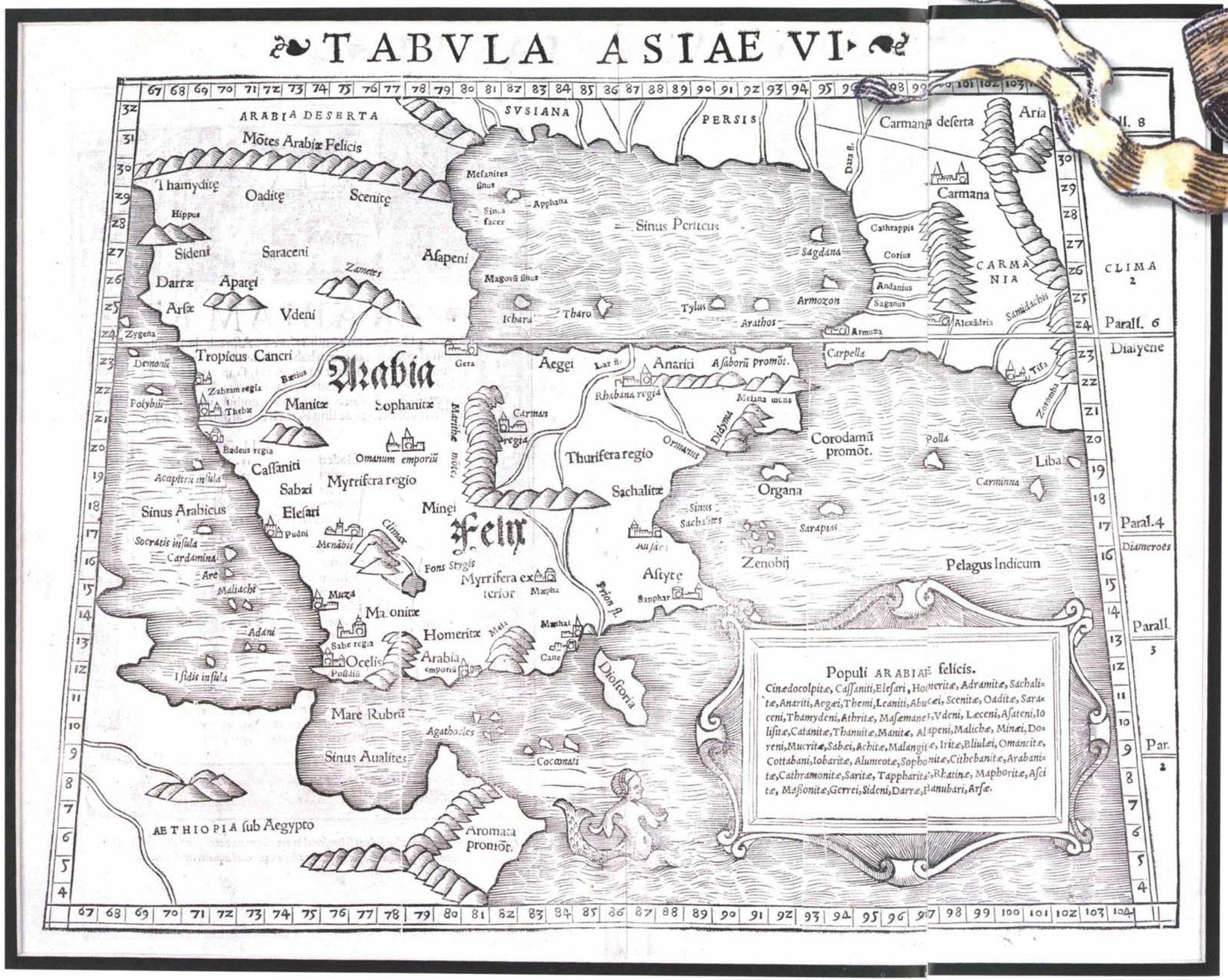


Aqaba

7

When the desert route was too dangerous, the route through Jordan ran farther west through Kerak to join up with the Cairo road at Aqaba on the Red Sea. Here again was an ancient settlement, Eilat and Ezion-Geber, Roman Aila and Islamic Ayla.

Qal'at al-'Aqaba is pre-Ottoman, and it is considerably bigger than the other forts, mostly because of its strategic position at the head of the Gulf of Aqaba. A monumental inscription within the entrance to the castle records its construction by the Mamluk Sultan Qansuh al-Ghawri in 1514 or 1515, although recent Belgian–British excavations have revealed that older construction, probably from the early Islamic period, underlies it. Although the fort now stands some distance from the sea, it was originally built next to the beach, which in more recent times has been built up to form a promenade. Opposite the entrance to the fort stands a minaret, which is one of the few reminders of the old town that surrounded the fort in earlier times.



The development of printing in the 15th century coincided with the European translation of numerous classical works, including those of the Alexandrian geographer Ptolemy, from Arabic back into their original Greek and Latin. None of Ptolemy's originals survive, yet his *Geographia* was an early foundation for European cartography. His section map of the Arabian Peninsula was one of several dozen that his treatise covered. It is shown here in a woodcut version printed in 1540 in Basel. Note the border showing parallels and meridians, the rather approximate overall shape of the Peninsula—which influenced later generations of mapmakers—the names of the tribes listed in the cartouche and the entirely fanciful rivers. The Arabian Peninsula is in fact one of the largest regions of the world that has no navigable rivers, a lack that was to delay accurate mapping of the interior.

MAPPING ARABIA

WRITTEN BY JAMES V. PARRY

MAPS COURTESY OF THE BUKHARI COLLECTION OF ANTIQUE MAPS OF ARABIA

The Arabian Peninsula is a daunting prospect for a mapmaker. Covering more than 2.6 million square kilometers (1 million sq mi) and including today's Saudi Arabia, Bahrain, Kuwait, Oman, Qatar, the United Arab Emirates and Yemen, the Peninsula offers some of the world's most inhospitable terrain. Until the 20th century, the vast sweeps of sand dunes and gravel plains, the roasting heat and the scarcity of food and water proved tremendous obstacles to European travelers in general, and no less to cartographers.

This was despite Arabia's millennial roles as a hub of the trade that linked the Mediterranean with India and as a prime source of frankincense and myrrh, essential commodities to the Greeks and Romans. In the seventh century of our era, Islam lent global significance to the cities of Makkah and Madinah, but little of the geographical scholarship that this stimulated, both in the oral traditions of the tribes and in the learned field of Islamic cartography, reached the ears or eyes of Europeans.

Thus the earliest European visitors to Arabia had little to go on beyond hearsay and the reports—often fictional or wildly exaggerated—of those who claimed to have been there before. In its "emptiness," Arabia resembled other places little known to Europeans, such as Africa and China. Only with the unfolding of the Age of Discovery in the 15th century and the advent of scientific cartography did it become possible for the exploration and mapping of the Peninsula to be begun in earnest—a process that, in this new century, is for the first time in the hands of its own people.

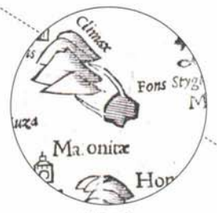
The story told by the Marian Bukhari Collection of Antique Maps of Arabia actually begins almost 2000 years ago with the "father of cartography," Claudius Ptolemy. A Greek resident of Alexandria in Egypt, he was responsible for the famous library there from AD 127 to 150. Building on work by earlier scholars, notably Strabo and Eratosthenes, Ptolemy compiled a gazetteer entitled *Geographia*. It was an ambitious attempt to catalogue all of the known world's place-names, some 8000 in all. Much of the information in the portion of the directory devoted to the Arabian Peninsula also drew on the accounts of Greek sailors, who were especially familiar with the Red Sea coast and who had heard stories of interior towns from the local inhabitants of the ports. But the secondhand nature of such information, in which the location and distances

between towns were based on unfamiliar standards such as the length of camel marches, meant that many of Ptolemy's efforts were little more than guesswork. Even so, they represented the most advanced account of the world's geography at that time.

He accompanied the *Geographia* with a map of the world, together with a series of between 26 and 64 regional maps. Neither the exact number of these nor their precise content is known, for all of the original components of the *Geographia* were lost, possibly not long after their completion. Copies, along with works by others that were based on the originals, were used by Arab scholars from the eighth to 12th century in laying the foundations of their own cartographic tradition. (See "The Triumph of al-Idrisi," page 29.) Yet outside the Muslim lands, Ptolemy's achievements remained forgotten until the Arabic versions were translated back into Greek in the 13th century and thence into Latin by the early 15th century. Although full of errors and "improvements" of dubious factual value, these re-translations of Ptolemy served as the single greatest source for the rash of new European maps that appeared in the last decades of the 15th century, thanks in large part to advances in the craft of printing.

Two of Ptolemy's maps that came down through this chain of transmission showed Arabia, and they mark the first time that the shape and topographical character of the region is known to have been depicted. One of these maps covered the areas known as *Arabia Petraea* and *Arabia Deserta,* placing them in present-day Iraq, Jordan and the Levant. The other featured *Arabia Felix* and applied the >>

In a map that cartographic historian Gerald Tibbetts calls the first "modern" map of the Peninsula, published in 1548 in Italy by Giacomo Gastaldi, the locations of most coastal towns are accurate, though the interior remains speculative. Right, above: More than a century later, this artful map printed in Amsterdam by Jan Jansson shows further refinement of coastal features, but lakes, rivers, random topography and fanciful wildlife—including an elephant and lions—fill the interior. Insets, right: One of the most persistent of early cartographic errors was the supposed presence of a large lake between the Hadhramawt and the Rub' al-Khali (Empty Quarter). It was first noted by Ptolemy and appeared in a number of different maps for more than a century until its existence was disproved in the late 17th century.



1540

1548

1579

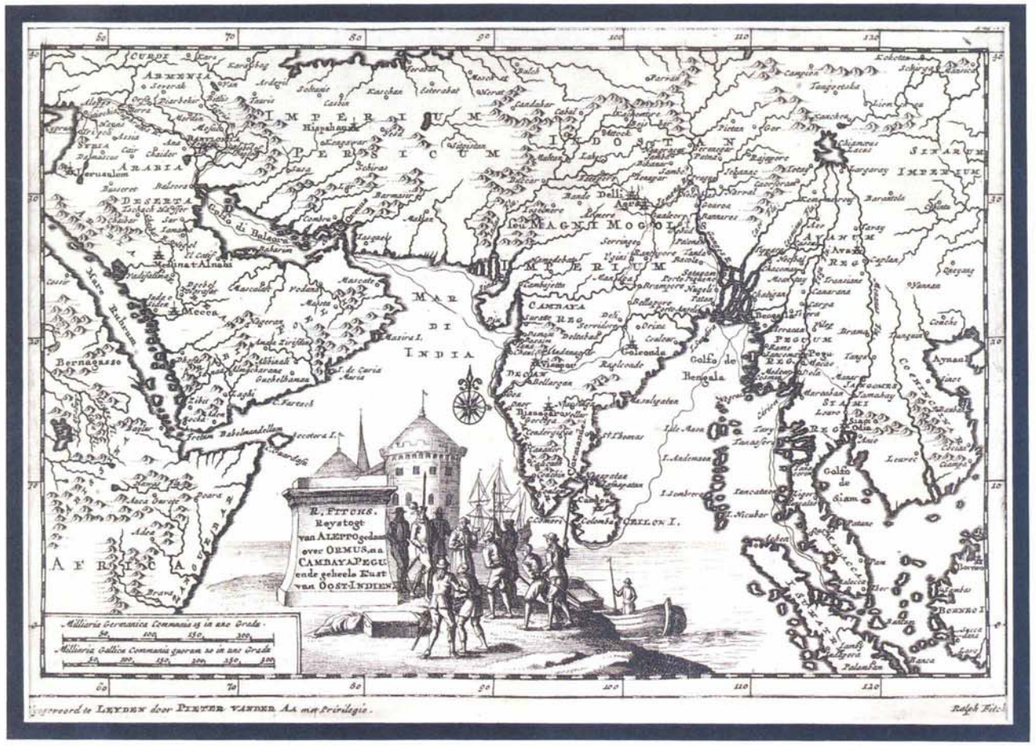
1627

1658

1683

The Bukhari Collection of Antique Maps of Arabia was placed on public view last spring at the Brunei Gallery of London's School of Oriental and African Studies in an exhibition supported by Saudi Aramco and called "Mapping the Treasures of Arabia." The collection of 187 maps, collected privately over 20 years by Marian Bukhari, is "among the most comprehensive and impressive to have been assembled in recent times," says Jonathan Potter, a leading London antiquarian map dealer. Other major collections of European maps of Arab lands lie in the King 'Abd al-'Aziz Public Library in Riyadh (see page 35) and in the estate of Khaled al-Ankary, an art collector and former minister of education of Saudi Arabia.

As the Ottoman Empire incorporated the coastal fringes of the Peninsula, cartographers responded. This 1627 copperplate map by John Speed of London takes the cartographer's art to a new level, with registers of insets that make it a forerunner of today's road maps and travelers' guidebooks. Along the top, it shows street plans of Famagusta, Damascus, Cairo, Jerusalem, Constantinople, Rhodes, Alexandria and Hormuz. The growing European fascination with Mediterranean and Islamic cultures shows, too, in Speed's side registers showing men's and women's costumes from Greece, Egypt, Syria, Arabia and Persia.



term to the whole Peninsula, rather than to the southern portions of it. The maps were first printed in Bologna in 1477, the culmination of a fiercely competitive race to publish versions of Ptolemy's works following their rediscovery. Plenty of mistakes were made in the rush, even extending to the incorrect printing of the date, but the maps made a dramatic impact nonetheless, and their accuracy remains an impressive achievement. Geographical parallels and meridians —forerunners of lines of longitude and latitude—had been established by Greek scholars by the end of the third century BC, and Ptolemy made good use of this knowledge, drawing (or, more probably, instructing his draftsman to draw) a fairly coherent representation of the Peninsula.

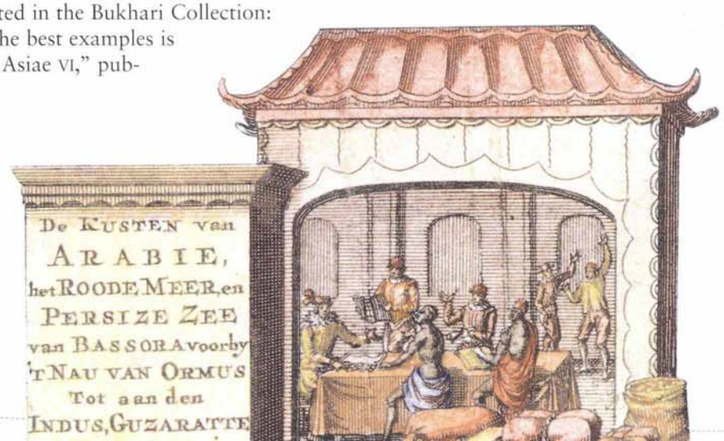
Although Ptolemy overestimated both the width of the southern part of Arabia and the size and shape of the Arabian Gulf, his overall form of the Peninsula, as distilled and represented by late 15th-century European cartographers, was hugely influential, and it served as a standard to which European maps of the region adhered for many years. This legacy is well represented in the Bukhari Collection: One of the best examples is "Tabula Asiae VI," published in Basel in about 1540. This map highlights the rather square shape Ptolemy gave the Arabian Gulf and includes a cartouche giving the names of local tribes. However, as with many early maps, towns are placed only very approximately.

By the early 16th century, the boundaries of European geographical knowledge and experience were expanding rapidly. Most mariners had access to portolans, charts made for sailors showing exclusively coastal features such as ports, river mouths, reefs and sandbanks. Portolans became increasingly accurate as nautical use of the compass and other instruments improved. (See "The Cartographer's Tool Kit," page 33.)

The larger impetus for this exploration was, of course, trade and the profit it could bring. The quest for opportunities made ever more detailed knowledge of the world both essential and possible. This era proved to be a turning point in cartography, as the crowned heads of Europe vied with each other in granting patronage not only to the explorers, but also to the growing guilds of mapmakers and printers who with poised pens awaited the return of expeditions from *terrae incognitae*.

New maps were published frequently at this time, and earlier ones were subject to regular revision. In 1548, the Italian Giacomo Gastaldi published "Arabia Felix Nova Tabula," the first to be focused specifically on Arabia. Cartographic historian Gerald Tibbetts, author of the 1978 book *Arabia in Early Maps*, regards it as the first truly modern map of the Peninsula. Not only was Gastaldi able to present Arabia's shape and orientation more accurately than Ptolemy, but he also confidently plotted certain coastal towns—Jizan was one—for the first time, though much of the inland detail remained arbitrarily drawn. It even included an enticing—but totally fictitious—lake, *Stag lago*, in the middle of the Rub' al-Khali, a feature whose genesis lay in an area of water marked by Ptolemy, but expanded by Gastaldi and propagated by other wishful-thinking cartographers after him until its eventual deletion during the 17th century.

Such errors were commonplace. Indeed, the variable quality of early maps meant that cartographers working from more than one source were liable to compound the errors of their predecessors. Gastaldi himself plotted two Hadhramawts. Nor did draftsmen allow their ignorance of a particular region to inhibit them, often filling areas of uncertain content with entirely fictitious and exaggerated features or



Dutch maps of the early 18th century reflected commercial and colonial interests that reached from Amsterdam to East Africa, India and Southeast Asia, a network in which the Arabian Peninsula played a relatively minor role. In a 1707 map by Pieter van der Aa, the cartouche above depicts a famous incident in the ongoing conflict between the Dutch and the English. At right is a cartouche from another van der Aa map of the same year, showing a "factory" where Dutch merchants, called "factors," bought bales of spices from locals.

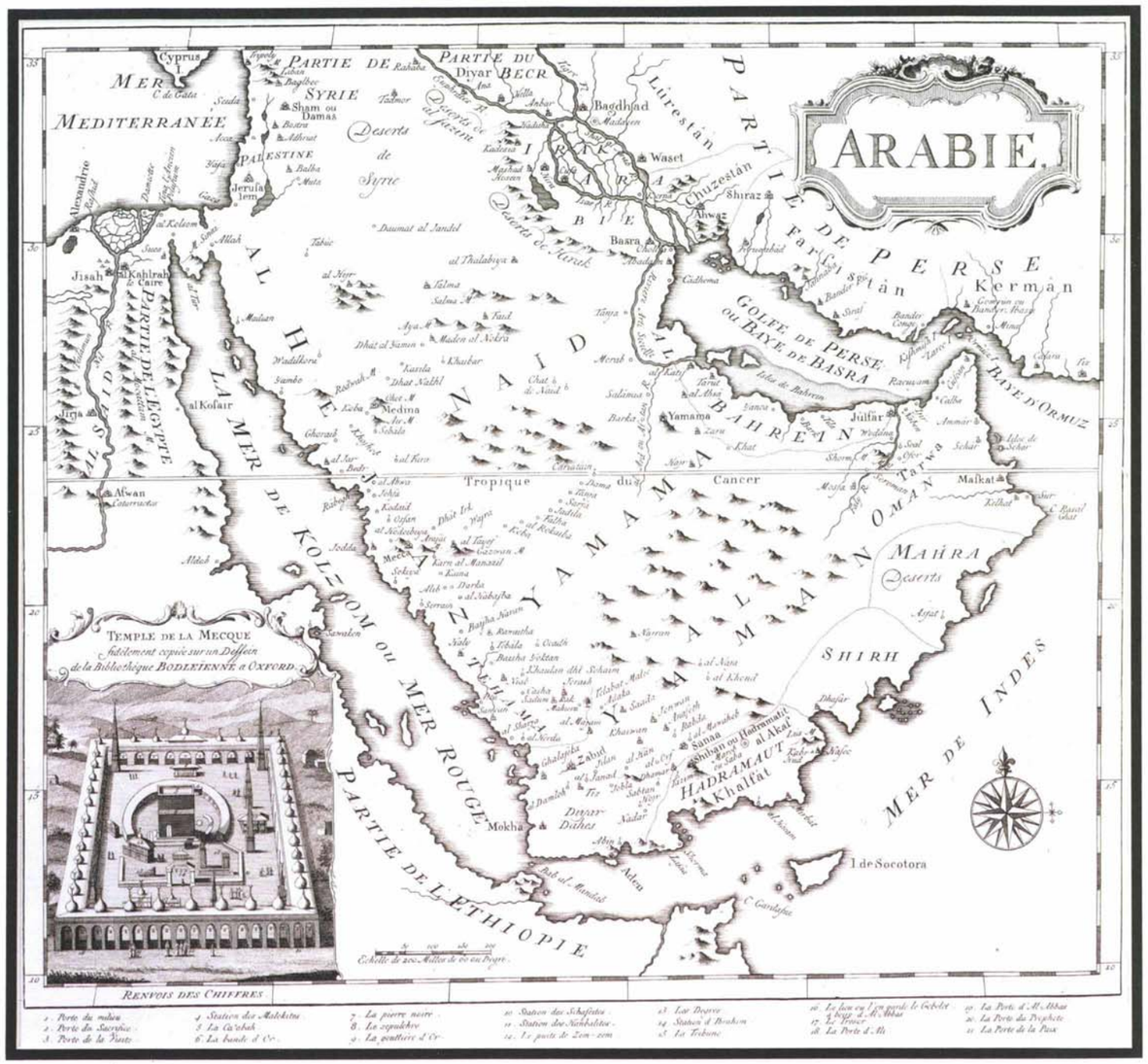
A Passion for Maps

In grade school in Karachi, Pakistan, Marian Bukhari began to scour atlases and meticulously draw maps of places real and imagined, developing what she today calls "my creative obsession with geography." As a young adult, she earned a degree in ancient civilizations, philosophy and English at the University of Punjab in Lahore. In late 1971, as relations between India and Pakistan deteriorated, she and three friends—including her future husband, Saleem—left their homeland by car, just days before war was declared, with the ambitious plan to drive to England. Marian took charge of "navigation, food and itineraries." She recalls sitting with out-of-date road atlases and scribbled notes on sites of historic interest in every country from Afghanistan to France—and it was then she realized that making sense of these was both a passion and a skill. "It suddenly came home to me just how central maps and navigation were to be in my life," she says. "That journey was as much about my own future direction as it was a case of finding the right road between Tehran and Tabriz."

On reaching London, she worked for several charities and soon embarked on a master's degree in anthropology and archeology at the University of London. Saleem took a post in Saudi Arabia, working on city planning for Madinah. His phone calls and letters, with tales of places that to Marian sounded remote and fascinating, inspired her to buy her first antique map of Arabia—a 16th-century engraving based on one by Ptolemy. She found it in a bookshop near the British Museum. This triggered a consuming interest in the cartography of the Middle East in general and the Arabian Peninsula in particular.

Her quest over the next two decades took her to secondhand bookshops and book and map fairs across Europe, during which time she collected what has turned out to be one of the most important collections of Arabian maps. In 1982 she joined Saleem in Jiddah, from where they began to regularly search for historical landmarks and archeological sites that until then she had known only as names on her maps. "Working from original texts, I was able to retrace the steps of the early explorers and cartographers. In some cases, little had changed since their day. The terrain was just as difficult, the conditions as harsh now as then. I'm left in awe of their dedication and perseverance," she observes.

Today, still resident in Jiddah, she has traveled throughout the Peninsula and her collection exceeds 200 maps. "Little did I know where that first map would lead! It's a fascinating hobby, rediscovering ancient routes and sites under hot, cloudless skies and then following up the fieldwork with map research in cool, musty libraries. It's been an act of love, really, both for maps and for Arabia."



One of the most elegantly engraved maps in the Bukhari Collection, this 1740 work by an unknown cartographer was published in Paris as part of a book on the life of the Prophet Muhammad. Its inset identifies 21 features of the Grand Mosque in Makkah.

obscuring them by a conveniently placed cartouche.

Gastaldi's work notwithstanding, during the 16th century it was unusual for Arabia to appear as the sole or even primary feature of a map. The heyday of the incense trade was long gone, and Europeans generally wrote off the Peninsula as a sandy and unprofitable waste compared to the promise of silver, gold, diamonds, ivory and exotic textiles from the Americas, sub-Saharan Africa and India. Additionally, since the 16th century, the coastal fringes of the Arabian Peninsula had been a part of the Ottoman Empire. From their capital in Constantinople, and through their control over much of the Balkans, the Ottoman Turks exerted enormous political and cultural power, and their power generally defined western depictions of the region. By the 17th century, tales of exotic dress and customs had fueled the European imagination, and cartographers responded. Maps and atlases had become important conduits of information about distant lands and peoples, and privileged access to such information was something for which customers were prepared to pay.

The Triumph of al-Idrisi

Long before the Islamic era, the beginnings of Arab cartography lie in oral traditions and diagrams sketched on skin, bone or wood. The advance of the Arabs under the banner of Islam during the seventh century meant that itineraries and route maps were required for military campaigns: The ascendancy of Islam both reinvigorated scholarship and required more accurate assessments of time and space. Scholars such as al-Fazari, working in the 770's, compiled astronomical tables based on he movements of the sun and moon that were later expanded into lists of towns, complete with the distances from one to the next and the approximate direction of the roads connecting them.

During what is often referred to as the golden age of Islam, the Caliph al-Ma'mun (786–833) sent emissaries from his court in Baghdad to buy Greek manuscripts in Constantinople and beyond, and in this way the cartographic achievements of Ptolemy became known to Arabs several hundred years before their rediscovery by Europeans. Al-Ma'mun also commissioned a large map of the world, and though it was reputed to have been the best of its era, none of it survives and information about it is scant. (See "The Curious *Book of Curiosities*," page 31.)

The next four centuries saw a flourishing of Arab cartography during which the Arabs became renowned for both their knowledge of the world and their achievements in a range of scientific fields. The foremost geographer of this period was Abu 'Abd Allah Muhammad al-Idrisi, born in 1100 in Ceuta or in present-day Morocco. A student at the University of Córdoba in Andalusia, at that time the greatest center of learning west of Cairo, al-Idrisi traveled unusually widely, apparently visiting England, Constantinople and Central Asia. He settled in Palermo, Sicily at the tolerant and enlightened court of the Norman king Roger II Guiscard, where he was charged with the production of a book on geography. It was to contain all available data on the location and climate of the world's main centers of population. King Roger himself enthusiastically interviewed travelers passing through his kingdom, and agents and draftsmen were dispatched to gather material—a research process that took some 15 years.

In 1154, just a few weeks before the king died, al-Idrisi's book was finally complete. Written in Arabic and Latin and accompanied by maps, it presented the world as a sphere. It calculated the circumference to be 37,000 kilometers (22,900 mi)—an error of less than 10 percent—and it hinted at the concept of gravity. Following the classical Greek tradition, al-Idrisi had divided the world into seven climatic zones and described each in turn, supported by 70 longitudinal section maps which, when put together, made a rectangular map of the known world. This was complemented by a smaller, circular world map in which the south was drawn at the top and Arabia, being the site of Makkah, was depicted centrally.

Al-Idrisi's book came to be known as *Kitab Rujar* (*Roger's Book*) and the circular world map was engraved onto a silver tablet. Sadly, both the book and the silver map appear to have been destroyed during civil unrest shortly afterward, in 1160. Thus our understanding today of al-Idrisi's conclusions is based on an abbreviated version of a second book that he wrote for Roger's son, William II. Manuscripts of this so-called "Little Idrisi" are held today in a handful of European libraries.

By any measure, al-Idrisi's work is a milestone in the history of cartography, one that foreshadowed many of the European "discoveries" of later centuries and served as an inspiration for centuries of Muslim thinkers, including the celebrated 14th-century historian Ibn Khaldun.

Yet to Europeans, these revolutionary maps—actually made in a European court—remained unknown for some 450 years, until a version of al-Idrisi's second book was printed in Rome, in Arabic, in 1592 and in Latin several decades later.

Unknown in Europe until 1592, al-Idrisi's world map, above, shows the world as a sphere, with south at the top and the Arabian Peninsula at the center. Copies of his sectional maps, shown here in a 1928 facsimile, offered more detail.

UPPER: BODLEIAN LIBRARY; LOWER: KONRAD MILLER / BRITISH LIBRARY, MAP 856.(6)

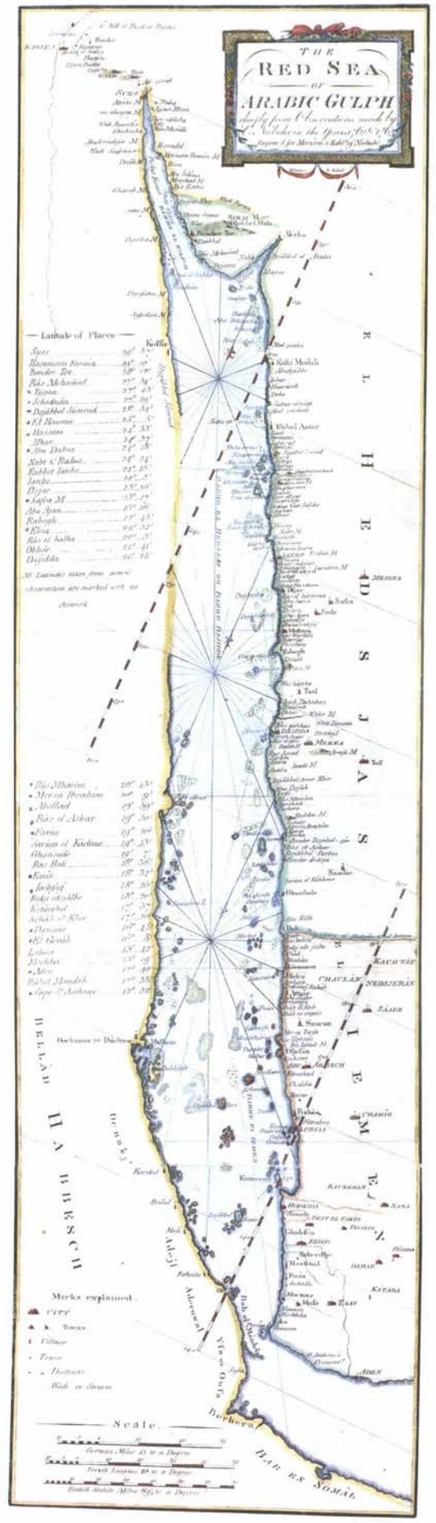
Such commercial considerations must have been in John Speed's mind when he prepared his 1627 copperplate engraving "The Turkish Empire" as part of his book *Prospect of the World*. One of the most visually impressive of all the maps displayed in the Bukhari Collection, it is a beautiful work, adorned with depictions of eight cities and careful vignettes of "typical" local costumes. In practical terms, this map also illustrates how the understanding of the general shape of Arabia had improved by this time.

In the early 18th century, Dutch interest in the region grew along with Dutch commercial activities in the East Indies. Cartographer Pieter van der Aa produced maps as attractive as Speed's, although his technical accuracy was arguably less assured. His works include "De Roode Zee met de Kusten van Arabien," a 1707 map of Arabia and the Red Sea, complete with an elaborate cartouche showing exotically dressed locals.

By this time European knowledge of the coastlines of the African continent and India had advanced considerably, and the interiors of these lands were beginning to be sketched along the courses of navigable rivers. But with no rivers up which to venture, Arabia was doubly difficult to chart, and the locations of inland towns remained largely speculative, the subjects of unreliable and often conflicting reports.

As the 1700's progressed, the application of a more scientific approach to education and learning extended to cartography. The desire to put mapmaking on an empirical basis that would reflect measured realities rather than hearsay or estimates became the catalyst for the creation of the "scientific expedition." The first of these to be dispatched to Arabia went in 1761 at the behest of Frederick v, king of Denmark and a noted patron of the arts and sciences. Charged with conducting a rigorous survey of the physical Peninsula as well as its people, flora and fauna, the expedition included a doctor, a botanist, an artist, a philologist, a surveyor and a manservant. Only one returned alive: Carsten Niebuhr, the surveyor. His work, and that of his comrades, was to have a lasting impact.

The Danish party sailed to Arabia via Egypt, where Niebuhr calculated the height of the Pyramids and plotted the Rosetta branch of the Nile so accurately that his plans were used more than a century later in the construction of the Suez Canal. After making landfall close to Jiddah, where they spent six months before heading south to what is now Yemen, the members of the team got down to their respective tasks. For his part, Niebuhr set off from camp each day by donkey with his surveying equipment, which included a compass and an astrolabe, as well as a sabre and two pistols. His activities caused some consternation among the local populace—especially when he invited them to look through the astrolabe's viewfinder, which displayed the subject upside-down—but the painstaking results he produced set exacting new standards and laid the scientific foundation for later expeditions to Arabia and elsewhere. Throughout his travels he maintained a meticulous diary, complete with sketches and measurements, which, after he returned to Europe in 1767, provided him with the material to produce a series of detailed maps of southwestern Arabia and of the towns he had visited there.



Carsten Niebuhr's 1762 copper-engraved map of the Red Sea, the product of the first European scientific expedition to Arabia, is an early masterpiece of empirical cartography. Below: A trader's caravan from a 1675 map of all of Asia published in The Netherlands by Frederick de Wit.

London antiquarian map dealer Jonathan Potter views Niebuhr's work as a watershed: "He really moved Arabian mapmaking into a new league. No one had gathered data so scientifically before. He had such a grim time, constantly falling ill, being stoned by unfriendly locals, his colleagues dying around him, and yet he stuck to his task and refused to give up."

Two masterpiece maps in the Bukhari Collection exemplify Niebuhr's contribution. The first, by him, is "The Red Sea or Arabic Gulph," a copper-engraved and hand-colored map of such precision that it was still being used by the British Royal Navy a century later. The second demonstrates his influence: In 1751, a decade before Niebuhr's expedition set out, Jean-Baptiste Bourguignon d'Anville, a scrupulous French cartographer working from the maps of al-Idrisi, among others, had produced a map of Arabia in which he applied the latest scientific knowledge and corrected errors that

THE CURIOUS BOOK OF CURIOSITIES

Despite al-Idrisi's second book, the precise nature and extent of his work and that of earlier geographers remains frustratingly uncertain. With most of the original documents now lost, there is often little or no evidence to help us understand exactly how these scholars of the past pieced together their comprehension of the world. However, in June 2002 the Bodleian Library in Oxford, with the help of Saudi Aramco, acquired through a London antiquarian dealer an 11th-century geographical manuscript that Lesley Forbes, the library's keeper of oriental collections, calls "a unique Islamic manuscript of the first importance, containing a hitherto unknown series of maps and astrological drawings largely unparalleled in any other known sources." It carries the lyrical Arabic title *Kitab Ghara'ib al-Funun wa Mulah al-'Uyun*, or *The Book of Curiosities of the Sciences and Marvels for the Eyes*.

Although the author of the book is not known, research to date by Jeremy Johns, Emilie Savage-Smith and Yossef Rapoport of Oxford's Oriental Institute shows that he was well acquainted with both Sicily, where al-Idrisi lived, and Egypt, where, they speculate, the book was compiled. Much of the information draws from Ptolemy's *Geographia* and other known sources, which the author credits. However, there are other sections, including one on the place-names of the Arabian Peninsula, that carry no attribution and that may therefore constitute original, hitherto unknown material.

Of key interest is an oblong map. It is one of the two cartographic depictions of the world that accompany the treatise. (The other is circular, which was more typical for the period.) Its rectangular shape makes this map unique among those known from its era, even though much of its detail appears to be either derivative or copied. The map is also noteworthy for its lateral scale, which may have made it possible to plot the location of towns from coordinates. This makes it suggestive of modern maps marked with meridians, techniques whose forerunners were proposed in the second century of our era by Marinus of Tyre and later by the 10th-century geographer Suhrab.

All these are clues that point toward the possible derivation of this oblong map from the lost map of al-Ma'mun, making it the latest, and most exciting, recent discovery in the ongoing study of the history of the cartographic links between the Islamic and European worlds.

The book's unknown author likely lived in either Egypt or Sicily, and his work may hold keys to the "missing links" in Islamic cartography between the ninth-century "lost map" of al-Ma'mun and al-Idrisi's maps of the mid-12th century.

BODLEIAN LIBRARY, MS. ARAB C90

had been perpetuated in maps of the region for many decades. Rather than filling those areas he was unsure of with imaginary information, d'Anville pointedly left them blank. Indeed, it was partly the desire to fill such gaps that prompted the Niebuhr expedition. Accordingly, a revised version of d'Anville's work was published in 1794 with the inscription "A New Map of Arabia, with additions and improvements from Mr. Niebuhr."

Niebuhr's map of Yemen marks the first systematic attempt to chart the inland topography of the Peninsula.

Because Europeans did not travel them, the old incense trails and the well-worn pilgrimage routes to the Holy Cities—frequently one and the same—were often neglected. It was not until the early 19th century that European acquaintance with the Arabian interior became sufficient to allow cartographers to plot these longstanding routes with confidence. One example is the map by an unknown draftsman published by Waugh & Innes in 1820 in England: "Arabia, Hajj Routes from Sham, Bagdad and North Africa." On it appear the main pilgrimage routes, with clear annotations of their origins, such as "Route of the Indian Caravan." An early example of a map reproduced by lithography, its focus on the Hajj and Islam also reflects the burgeoning contemporary interest in the region and its culture, part of the trend that came to be known as Orientalism.

By the mid-19th century, there was an upsurge in the accuracy of map data, as the fruits of scientific enquiry helped provide the missing pieces of the global jigsaw puzzle. In Arabia, much of this progress hinged on the discoveries of other explorers such as Johann Burckhardt, William Palgrave, Richard Burton and Charles Doughty. Irascible and judgmental, Doughty traveled in what is now Saudi Arabia during the 1870's, and although his scientific contribution was ignored or even scorned by contemporary academics in his native England, he was central in recording the topography and the toponyms of Arabia's interior. Doughty had the patience and dedication to record the factual knowledge that for so long had resided solely with the people that knew this region best—the Bedouins. He accurately noted down local place-names, as well as the locations of wadis and other topographical features, often supporting these with sketch maps, which he discussed with the Bedouins with whom he traveled. He had little regard for earlier mapmaking attempts: "The work of the cartographers in construing many unintelligible names of which no man in the country had ever heard, I found...to be commonly of little worth."

Doughty's efforts represented another watershed: Though he was a European, his work marks the first time Arab knowledge of the interior of Arabia had been systematically recorded and made available to other Europeans—in theory at least—through the mapmaking process. Despite the great achievements of Arab scholars such as al-Idrisi in earlier centuries, Arab input into the mapping of the Peninsula had been negligible until Doughty's time—simply because the local population had little need of maps, which were rightly regarded as a European obsession. Sadly, however, few of Doughty's records ever made it to the cartographic studio, and the potential of his achievements was not recognized until decades later, when he came to be admired by early 20th-century travelers to the region, among them Capt. William Shakespear and T. E. Lawrence, both of whom were active in mapping as well as other pursuits.

Chronologically, the Bukhari Collection ends here, with a 1901 lithograph of the Red Sea. It is a suitable juncture at which to pause, for the ensuing decades saw tumultuous change in Arabia. In the run-up to World War I and the demise of the Ottoman Empire, the region was the subject of bouts of military cartography as the colonial powers struggled to understand the terrain over which they were arguing. Interestingly, even in the early 20th century the precise scientific coordinates of such prominent towns as Madinah remained unknown to the European powers.

The upheavals of this time also heralded the reawakening of Arabia's aspirations to autonomy, most significantly under the leadership of King 'Abd al-'Aziz Al Sa'ud, who unified much of the Peninsula and proclaimed the Kingdom of Saudi Arabia in 1932. Unification and the end of intertribal disputes placed responsibility for the welfare of the new kingdom and its people squarely on 'Abd al-'Aziz's shoulders, and one of his most immediate concerns was to

The Cartographer's Tool Kit

The earliest navigational instruments were devised to use the sun, moon and stars to calculate location and distance. For more than 2000 years, navigators have known how to determine latitude by measuring the angle of Polaris, the North Star, above the horizon. Such measurements were the basis of early cartography, and Arabs became renowned for their skill in this area, constantly improving the instruments that were used to make these calculations.

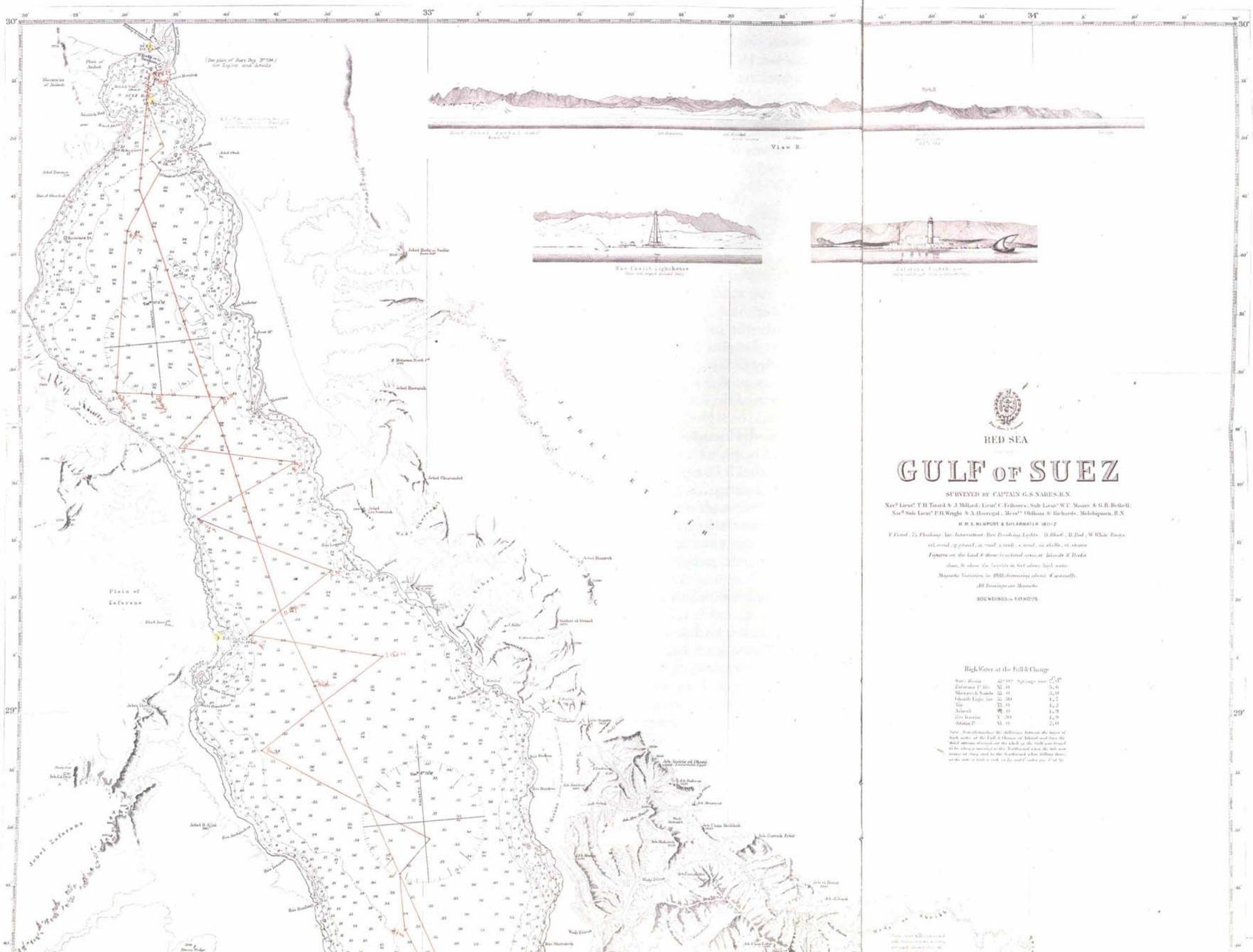
Their early tools included the **kamal**, a small, flat parallelogram with a hole in it, made of horn or wood, with a string threaded through the hole. It was used to measure latitude by fixing the altitude of Polaris. The navigator held a knot in one end of the string in his teeth and drew the string taut with one hand. With the other hand, he moved the piece of horn along the string, closer to or farther from his face, until the bottom edge of the horn was aligned with the horizon and the top edge was aligned with Polaris. He then made a second knot in the string where the horn was. By making the first reading at the time of the ship's or caravan's departure, and by similarly marking and comparing later readings, it was possible to keep track of changes in latitude and thus arrive at a rough estimate of how far the navigator had traveled north or south of the departure point. (Longitude, on the other hand, remained inexact until the 18th century.)

By the middle of the 15th century, similar information was calculated more precisely using a **quadrant**, a two-part instrument of wood or brass. A plumb bob hung either from a string or from a freely rotating arm and provided a fixed vertical reference against a 90-degree scale whose zero point was sighted on Polaris. The resulting angle was a direct reading of the navigator's latitude. However, the quadrant's dependence on a plumb bob limited its use to land or calm water: it could not be used from a rocking ship.

The most elegant and complex of the instruments was the **astrolabe**, invented in classical Greece and brought to refinement during the eight and ninth centuries of our era by Arab scientists, who subsequently introduced it to Europe in the early 12th century. Consisting of a framed circular disc, around a series of smaller discs or plates set on a central pin, an astrolabe shows the sky outlined on its face, and the moveable components are adjusted to reflect a specific date and time. Once set, the entire sky, both visible and invisible, is plotted on the face of the instrument and can be used to calculate both distance and direction. With various refinements, the astrolabe remained the most important cartographic instrument up through the 18th century: It was an astrolabe that Carsten Niebuhr used to produce his groundbreaking results in Arabia during the 1760's.

ascertain what the country's assets and resources were.

Although the search for oil, gas and minerals was ultimately to drive geological survey work across the region —and still does today—in its early years it was the need for water that was the catalyst for Saudi Arabia's resource exploration. In 1944 King 'Abd al-'Aziz approached the United States for a technical expert who could assist with the identification and plotting of the kingdom's natural resources, particularly its groundwater reserves. The individual who arrived, Glen F. Brown, was one of the pioneers of a partnership between the United States Geological Survey (USGS) and the government of Saudi Arabia that was to span the next five decades and play an important role in the development of the kingdom. Brown was initially charged with carrying out surveys of much of western and central Arabia, and he gathered his information in much the same way as earlier travelers. Using modern equipment,



KING 'ABD AL-'AZIZ PUBLIC LIBRARY

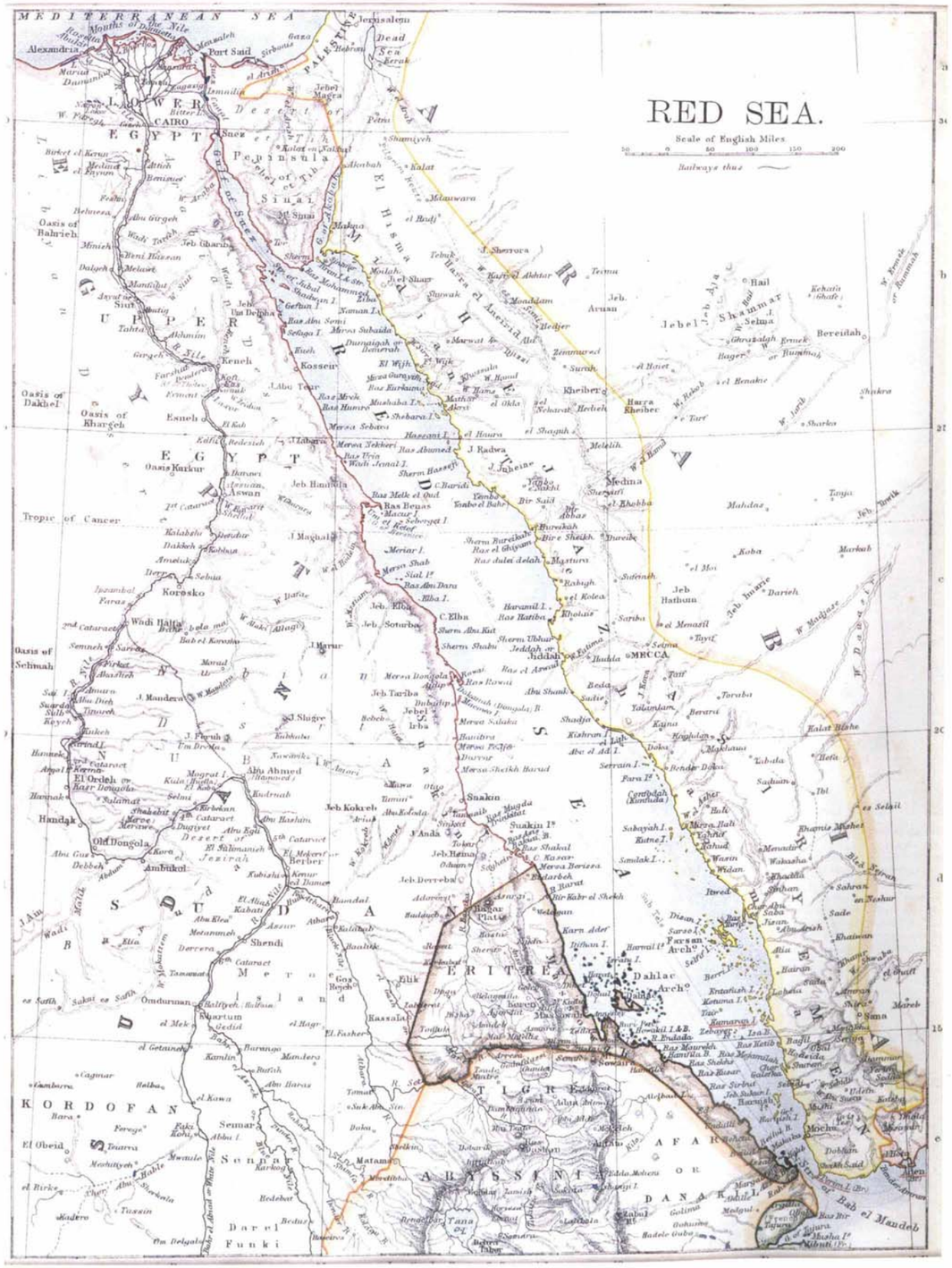
The King 'Abd al-'Aziz Public Library Collection

One of the largest publicly available Arabian cartographic collections lies in Riyadh at the King 'Abd al-'Aziz Public Library (KAPL). Established in 1985, the KAPL enjoys a growing reputation for the quality of its facilities and collections, the latter ranging from books and manuscripts to coins and photographs. Of particular interest, however, is the library's collection of several hundred maps of Arabia, centered on the 16th to 18th centuries. Since the library's foundation, says Supervisor-General Faisal al-Muaammar, "we were keen to build up a comprehensive collection of maps and charts of Arabia, so that this fascinating material could be made available to scholars and members of the public alike."

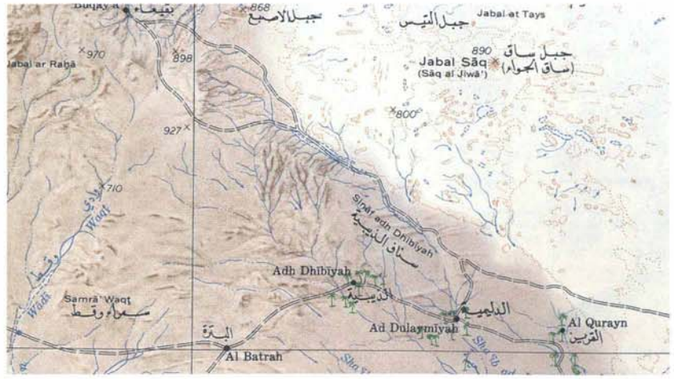
Although some of the maps were donations, the majority have been acquired on the open market. Represented are many of the top early cartographers, including Abraham Ortelius, Gerard Mercator, Frederick de Witt and Pieter van der Aa. Among the most notable works is an example of Ptolemy's "Sexta Asiae Tabula," published in 1511 in Venice by Bernardo Silvanus in a single edition. Silvanus was among the first cartographers to attempt the updating of Ptolemy's work, and this map shows the Arabian Peninsula, Arabian Gulf, Indian Ocean and the western half of the Indian subcontinent, and it carries an impressive amount of information. It was the first map of its type to be printed in two colors: Black ink illustrated geographical features and minor place-names, while red denoted the more important towns and areas.

Al-Muaammar notes that interest in Arabian maps is growing, and the KAPL is thus planning exhibitions in other Saudi cities and possibly elsewhere in the region. "We know that Arabs young and old are interested in seeing how the outside world perceived us and our lands throughout history," he says. "By opening people's eyes to these maps, we hope to bring the past alive for them."

Charted by Captain Nares of the Royal Navy in 1871 and 1872, this maritime chart of the Red Sea, left, shows soundings and some interior topography. The insets at top use the portolan method of charting coastal features by showing them as they would be seen from sea level.



The increased inland accuracy of this 1901 lithographed map, published in London shortly before the advent of aerial mapping, gives it much in common with the graphic presentation of today's mapping styles.



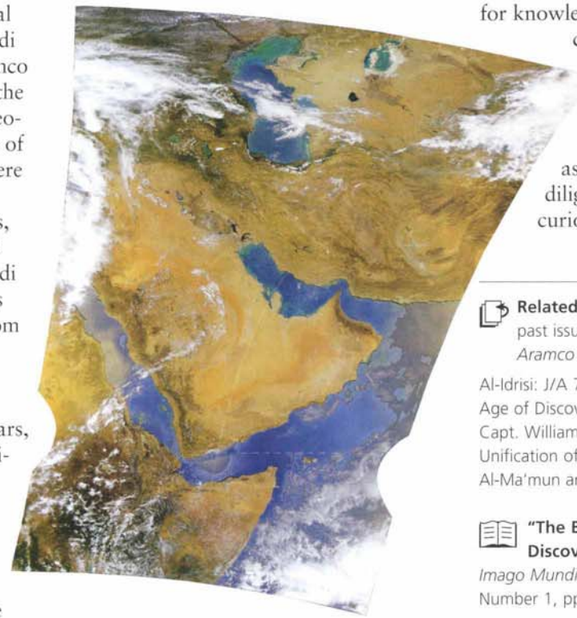
Details from a map of the Wadi al-Rimah region illustrate the kingdom-wide cartographic collaboration among the Saudi government, the United States Geological Survey (USGS) and Aramco following World War II. The map was produced in 1961 under the auspices of the kingdom's Directorate General of Petroleum and Mineral Affairs and published by the USGS; two of the principal fieldworkers were Glen Brown of the USGS and Richard Bramkamp of Aramco. Since 2002, such maps have been produced independently by the Saudi Geological Survey, marking the first time in history that the Peninsula's residents have controlled their own cartography. Below: A composite photograph from space recalls the projections of Ptolemy.

but still traveling part of the time on foot or by donkey, Brown and his companion, Richard Bramkamp of Aramco, measured temperature and humidity, identified and estimated the extent and quality of water and mineral resources and calculated topographical data. It is estimated that the two covered more than 38,000 square kilometers (15,000 sq mi) in little more than 18 months—an extraordinary achievement.

Soon afterward, such work was dramatically supplemented by aerial photography, and by 1954 the Saudi Ministry of Finance, USGS and Aramco were working together to produce the first full series of geographic and geologic maps of the country. The first of their type in the Peninsula, these were published between 1960 and 1963 in both Arabic and English versions, and the information they contained formed the basis of subsequent Saudi national development plans. To this day, all modern maps of the kingdom trace their roots back to these first publications.

The USGS continued to play an important role over the next 40 years, a time during which its responsibilities evolved from basic mapping and exploration to technical surveys to develop the Saudi mineral sector and search for geological hazards, a process in which the work of the cartographer has come to overlap with that of the geoscientist. Throughout this period, as part of its partnership, the USGS emphasized the development of Saudi technicians and administrators, something that Ronald G. Worl, former USGS mission director, regards as "one of the most rewarding achievements" of his job. In 2001, the Saudi government opened the doors of the Saudi Geological Survey (SGS), and the USGS closed its mission's doors last year.

The new generation of Saudi cartographers and of domestically published state-of-the-art maps adds the most recent chapter to the history of the mapping of the Arabian Peninsula, a process begun by Ptolemy more than 2000 years ago. The efforts of generations of explorers, mariners, merchants, scholars, surveyors and geologists have charted one of the world's great landmass interiors, creating along the way a direct pictorial link with the past. As works of both art and science, the historic maps of the Peninsula show more vividly than words how Arabia unfolded in the European consciousness as the result of trade and exploration, a thirst for knowledge and no small amount of courage and ingenuity. Now collected, arrayed and available for study, the maps of the Bukhari Collection and others stand as tributes to their makers: the diligent and the imaginative, the curious and the intrepid.



Free-lance writer **James V. Parry** (jamesvparry@aol.com) served several years with the British Council in East Africa and Oman. He writes on the history and cultures of the Arabian Peninsula from his home in Norfolk, England.

Related articles have appeared in these past issues of *Aramco World* and *Saudi Aramco World*:

Al-Idrisi: J/A 77
Age of Discovery and Islamic cartography: M/J 92
Capt. William Shakespear: S/O 02
Unification of Saudi Arabia: J/F 99
Al-Ma'mun and the "House of Knowledge": M/J 82

"The Book of Curiosities: A Newly Discovered Series of Islamic Maps," *Imago Mundi*, October 2003, Volume 55, Number 1, pp. 7–24.

Arabia in Early Maps: A Bibliography of Maps.... Gerald Randall Tibbetts. 1978, Oleander Press, 0-90267558-3, $95 hb.

The Arabian Peninsula in Old European Maps. Khaled al-Ankary. 2001, Institut du Monde Arabe.

UPPER: SAUDI ARAMCO / UNITED STATES GEOLOGICAL SURVEY / DIRECTORATE GENERAL OF PETROLEUM AND MINERAL AFFAIRS, KINGDOM OF SAUDI ARABIA; LOWER: NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Lebanon, Pasadena—Mars

WRITTEN BY PAT McDONNELL TWAIR

On January 3, much of the world focused on the mission control room at the Jet Propulsion Laboratory (JPL) in Pasadena, California on news that JPL's robot rover *Spirit* had landed safely in Mars's Gustav Crater. (Three weeks later its sister rover, *Opportunity*, successfully landed on the other side of the planet.) At the heart of the excitement—but at the fringes of the news coverage—was Lebanese-born JPL Director Dr. Charles Elachi, under whose supervision scientists were controlling the $400-million dune buggy.

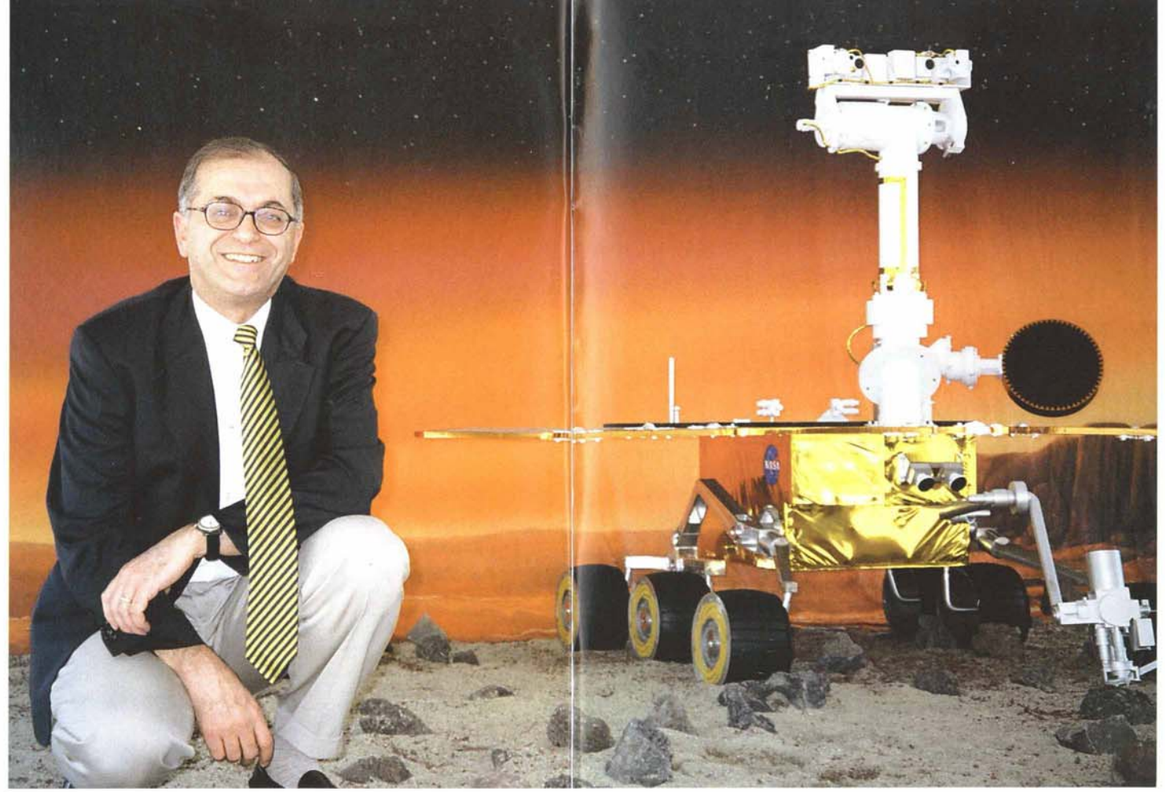
Just a day earlier, another JPL probe, the spacecraft *Stardust*, had sped through the comet Wild 2, some 1.1 billion kilometers (708 million mi) from Earth, and it had sent back photos that are "the best ever taken of a comet," says Elachi. *Stardust* also captured cometary material to return to Earth.

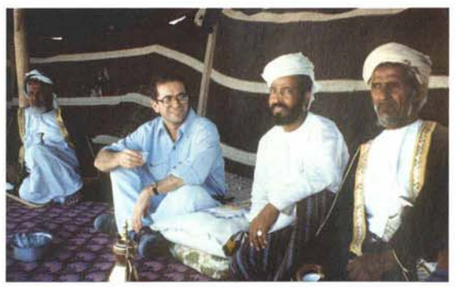
"But *Spirit*," he says, "captured imaginations."

Powered by solar energy, *Spirit* will wander some 10 to 15 kilometers (6–9 mi) during the next three months or more as it analyzes soils and drills into rocks in its search for water-bearing minerals or minerals deposited by precipitation, evaporation or hydrothermal activity.

"We had as many as 1000 scientists and engineers working at the peak of the Mars rover project, many of them young people in the early years of their careers, many of them women," comments Elachi, who was selected over 73 other candidates to head JPL in 2001.

"I don't participate in every detail of the dozens of space projects we are conducting, but in the case of the Mars rovers, I had to concur with the key decisions on configuration, such as when to release the parachutes that softened the landings," Elachi says. "When undertaking an exploration, you must be prepared for and aware of failure, yet work very hard for success. If you're well-prepared, your chances of success are much better.





At 56, Charles Elachi is the world's top expert in the technologies that are allowing us to see the surfaces of other planets—including the Mars rovers. Left: **On Earth in 1992, his remote-imaging skills helped find the historic city of 'Ubar, located in Oman.** Opposite: **Elachi poses with 16 leaders of the Mars rover project that drew on the talents of more than 1000 scientists and engineers.**

"The exhilaration is indescribable," he continues. "Exploration is about opening new doors and stepping into the unknown. Throughout the ages, explorers have pushed the limits. I think I have a taste of what Columbus, Magellan, Cook or Lewis and Clark must have felt."

The chances of success for the Mars rovers weren't that promising. The planet's harsh environment has made it a Boot Hill for earlier probes, including seven Russian attempts, three American ones and a British lander that failed in January.

"I find it amazing that we've developed the capability to send a craft 500 million kilometers [310 million mi] into space and seven months later land it within 80 meters [265'] of its target," he notes. "*Spirit* was moving at 20,000 kilometers per hour [12,000 mph] as it approached Mars and then had six minutes to decelerate to zero velocity. If our calculations had been just seconds off, it would have crashed."

A larger JPL-built lander, the Mars Science Laboratory (MSL), is scheduled for a rendezvous with Mars in 2009. It will use a miniature nuclear-power system for more detailed explorations.

Does Elachi think any part of our solar system beyond Earth has sustained life?

"Possibly some microbes or cells existed at one time on Mars," he responds. "We think that organic material may also be detected in comets, on the Saturnian moon Titan or on Jupiter's moon Europa, which has a surface that looks like floating ice."

The world will know much more about Titan after JPL's *Cassini* spacecraft enters orbit around the ringed planet on July 1 and releases its piggyback probe to penetrate Titan's thick atmosphere later in the year.

Elachi first gazed at the stars from his boyhood home in Rayak, Lebanon. He came to the United States as a graduate student and enrolled at the California Institute of Technology in Pasadena, where he completed his doctorate in 1971. His first work at JPL was with the Venus Radar Project, for which he led development of spaceborne imaging radar. Today, Elachi is the world's foremost expert in radar imagery of planetary surfaces—in addition to his specializations in the interpretation of active microwave remote sensing, wave propagation and scattering, electromagnetic theory, lasers and integrated optics. It was his task force that created the "corrective lens" for the Hubble Space Telescope in 1993.

His skills have been useful on Earth, too, scanning California's San Andreas fault, searching out traces of ancient roads near the "lost city" of 'Ubar in Oman and mapping subsurface valleys in Egypt and Sudan—as well as the Great Wall of China. Elachi stresses that radar mapping doesn't magically outline archeological ruins. Rather, it shows traces of old riverbeds, the compacted soil of long-forgotten roads and overall patterns that offer clues about what an environment was like thousands of years before.

As a professor of electrical engineering and planetary science at the California Institute of Technology before coming to JPL, Elachi wrote three textbooks and more than 230 scholarly papers and lectured extensively. Wherever he speaks, he says, he always remembers that he is following in the footsteps of medieval Arab scientists—many of them astronomers, navigators and engineers—who laid the foundations for today's understanding of the world.

As a boy, Elachi says, he was especially proud of the stars that carry Arabic names, given them by those who first charted the skies. Just in the constellation Pegasus, there are Enif, Aldebaran, El Nath, Markab and Algenib. Elsewhere in the sky, much closer and smaller, floats asteroid 4116 Elachi, named for him in 1989 in recognition of his contributions to planetary exploration.

Does he think the successes of the Mars rovers will indeed pave the way for a manned mission to Mars?

"Manned exploration is our long-term goal," Elachi says. "There's no doubt in my mind that we will have stations on the Moon and on Mars within this century. Just think what we've accomplished in the last hundred years since the Wright brothers first lifted their little contraption into the air in 1903."

Beyond that, he says, it is the future searches of neighboring solar systems for habitable planets that excite him most. "These missions may well find the answer to one of the most fundamental questions we humans ask: 'Are we indeed alone in this universe, or has life flourished elsewhere?' Perhaps Aldebaran is sending out its own explorers right now to answer the same question." ⊕

Pat McDonnell Twair (sampat@cyberonic.com) worked for six years as a journalist in Syria. Based now in Los Angeles, she is a free-lance writer who specializes in Arab-American topics. She has written an account of her life in the Middle East, *Two Thousand and One Syrian Nights*.

www.jpl.nasa.gov

UPPER: SAMIR TWAIR; LEFT: COURTESY OF CHARLES ELACHI; OPPOSITE: NORMAN SEEFF; COURTESY OF JET PROPULSION LABORATORY

Reader's Guide

BY JULIE WEISS

This two-page guide offers springboards, arranged thematically, that will help sharpen your reading skills and deepen your understanding of this issue's articles. We especially encourage reproduction and adaptation of these ideas, freely and without further permission from *Saudi Aramco World*, by teachers from late elementary school through early university courses, whether they are working in a classroom or through home study.

—THE EDITORS

Understanding What You Read

Pre-Reading Activities

An easy way to improve reading comprehension is to do something you probably already do: Flip through the magazine. Start with the Table of Contents. Look at the pictures and read about the four articles. What intrigues you? Go to the first article. Read the headline. Look at the pictures. Read the captions. Jot down a few notes about what the article seems to be about and a question or two you hope it will answer.

Reading-Comprehension Questions

The following activities are here to sharpen your reading by pointing you toward the most important parts of the articles. Complete them as written or in another way if it will work better for you.

"Journeys of Faith, Roads of Civilization" (pages 2–11)
Write the following questions at the top of a piece of paper. As you read, make notes that answer the questions. Add two other questions of your own and answer them in the same way. Who, in addition to pilgrims, used the roads? What roles did governments play? What services sprang up along the roads? What, in addition to people and goods, traveled along the roads? What kinds of events took place along the roads that lead the author to compare the roads to a university?

"Mapping Arabia" (pages 20–37)
This article presents a 2000-year history of maps of the Arabian Peninsula. That's a long time and a lot of information to keep straight. A timeline can help. Make a timeline that starts with Ptolemy and continues to 2003, when the Saudi Geological Survey took over full responsibility for mapping Saudi Arabia. Include the key events in mapping the Peninsula as the article reports them. Photocopy the maps in the article and place each map at the correct time.

Julie Weiss is an education consultant based in Eliot, Maine. She holds a Ph.D. in American studies and develops curricula and assessments in social studies, media literacy and English as a Second Language.

Class Activities

This month's activities revolve around concepts of Maps and Journeys.

Theme: Maps

How much fun is a map? More fun than you might think!

What is a map?
You might say a map is a symbolic picture of a place. To think what that means, let's compare a photograph and a map of a small town. A photograph of Main Street shows a row of stores, the sidewalk and some people walking by. A map, on the other hand, shows Main Street as if you were looking down from above, and it uses a line as a symbol for Main Street to show *the relationships* among Main Street and other things and places in the town.

What different types of maps exist?
More than you can count! Some show boundaries; others show climate, topography, population or natural resources. In some supermarkets you can find maps that identify locations of the supermarket's branch stores. Banks give away maps that show ATM locations.

Collect five maps of your own. Start with the most challenging: Draw your own map of your school or neighborhood. You can do this from memory or, as a more advanced assignment, use compass readings and your own steps for measurements. How hard is it? Then get a local map from an Internet map site by putting in your address. Third, find a road map of your town or city. Your fourth map is a historic map of your area that is at least 50 years old—your library probably has some. Finally, locate a scientific map such as a weather map, trade map, natural resources map or aviation map that shows your state, region or country. Share your maps with your classmates. How different are they? What do they have in common? As a class, name at least 15 different kinds of maps and, for each one, name the people for whom each is useful.

With this background in mind, turn to "Mapping Arabia."
Who makes maps, and why do they make them?
Until recently, the people of the Arabian Peninsula had little need for maps on paper, while Europeans created many of them. In a group of three, list reasons why, at different times, Europeans wanted to map the Peninsula and why the people of the Peninsula did not do so. Don't forget political, economic and military reasons.

Discuss with your group what set the maps of Charles Doughty apart from those that preceded them. What are possible reasons why, for centuries, no one did what Doughty did?

When did the people of the Peninsula become interested in mapping their own region? Do you think their maps differed much from Europeans' maps? To explore the question, write a three-way discussion among John Speed (1627), Charles Doughty (1870's) and an imaginary cartographer from the Saudi Geological Survey (2004). Have each of the three discuss his reasons for making maps. Include what was happening in the world at his time, how he gathered data, the best traits of his maps and the obstacles and limitations he faced. Present your conversations to the class.

Now turn to "Lebanon, Pasadena—Mars."
You can probably find a map of any place you want to see—on Earth. It's hard to imagine a time when large areas of the world were not mapped. But there's a modern-day mapping effort that parallels the mapping of Arabia. Imagine you are Charles Elachi. Write a letter to your class explaining why you are interested in mapping Mars. What do you hope to learn? Then compare Elachi's motives with those of the explorers and cartographers who have mapped the Arabian Peninsula. Make a Venn diagram showing what the Mars and Arabia mapping projects have in common and how they differ. What conclusions, if any, can you draw about what inspires people to make maps?

BUKHARI COLLECTION

How do function and form unite in the Arabian maps?
Maps are symbolic visual representations of places, but because they are primarily *useful*, most of us don't think of them in the same category as art, such as photographs, paintings or films in which *beauty* or *design* is often more important than utility. But the maps that accompany "Mapping Arabia" are both useful and beautiful. Let's take a closer look at John Speed's 1627 map on pages 24 and 25, and compare it to a modern map.

- First, notice the ornate decorations. Why is this map so much fancier than today's maps? How useful is an ornate map? Who would be most likely to use it? For what purpose?
- Do the colors make the map easier or more difficult to read? Why? How do the colors compare to the modern maps you and your classmates collected?
- The map's top border displays images of eight cities located in the Turkish Empire, while each side shows clothing worn in different places included on the map. Why might they be there? How do they relate to the map itself?
- Compare this map with a 2004 road map or tourism guidebook map. What is today's equivalent of the pictures of the eight cities and the clothing of the men and women who live there? Add to your own map of your neighborhood that you made (above) modern-day versions of Speed's insets. Evaluate how well your map's form suits its function by asking the same questions you asked about Speed's map.

What do maps reveal?
In the final paragraph of "Mapping Arabia," James Parry writes that "the historic maps of the Peninsula show more vividly than words how Arabia unfolded in the European consciousness." Find three examples in the article that support Parry's conclusion. Now return to the five maps you gathered before, only this time pretend you have come to the Earth from Mars and you want to learn about how Earthlings map their world in 2004. Some questions to get you started: What types of places do these people care about? What is important to them? How can you tell? How do they organize their towns, cities, farmlands and regions? Present your conclusions to your fellow Martians.

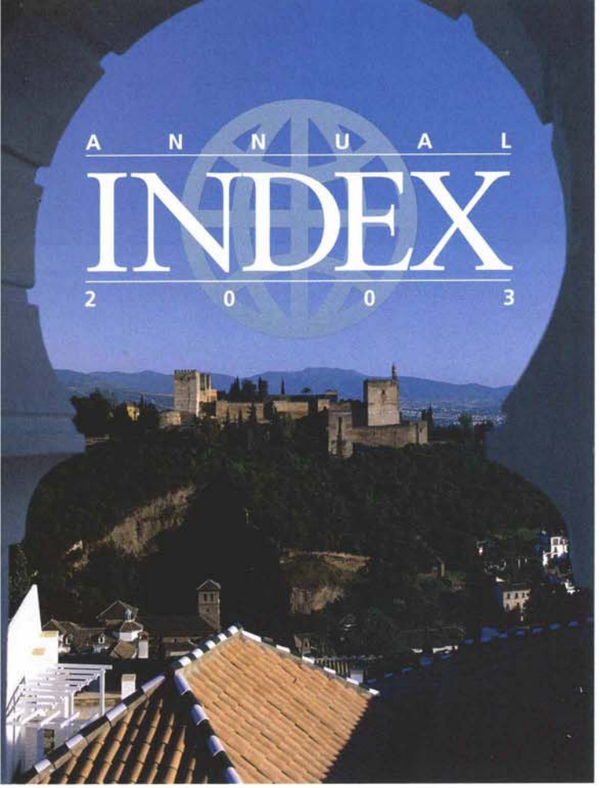
Theme: Journeys

People use maps to guide travels, so now that we've looked at maps, it makes sense to turn to journeys.

Why do roads develop where they do?
It's not always what you think. For example, did you know that the US Department of Defense funded much of the construction of America's interstate highway system during the Cold War? The highways that people now use to get to and from work and to go on vacation were built in part for the military to use in case of a national emergency.

What about the historic network of roads connecting parts of the Muslim world? Who built them and why? Refer back to "Journeys of Faith, Roads of Civilization." Make a web or sequence chain. Start by writing, "Islam requires all Muslims who can to make the Hajj." Brainstorm as many consequences of that one fact as you can think of. Of course, roads developed to accommodate the pilgrims. Now, what changes did the roads inspire? And what further changes come from those? (If you get stuck, ask yourself if you have thought about political, economic, social, intellectual, religious and military changes as well as all else that might have traveled the roads besides pilgrims.)

How is the world different today now that we can make "virtual journeys" along both an electronic information superhighway and along the more traditional "book highway" in the library?
The maps and roads we've been looking at are all real. They exist physically. A map shows a place on Earth (or Mars!). A road is a path along which people transport themselves and their stuff. Let's make a jump now from physical journeys to ones through words and pictures. Books, magazines, videos and the Internet can all take you on a kind of "journey." Compare your virtual journeys with the physical journeys of the Muslim pilgrims you have read about. What can you do that the pilgrims could not do? What could the pilgrims do that you cannot do? Now write two letters. The first is yours to a Muslim pilgrim traveling to Makkah 500 years ago, in which you explain the idea of an "information superhighway" with full libraries and a global Internet. Tell him or her about three "virtual journeys" you have made recently. Try to explain how how your life differs as a result. Then have your pilgrim respond to you. What is your pilgrim learning? How does his or her life differ as a result of the journey? (Don't forget that your pilgrim might have some "virtual journeys" to share too: Stories heard from others or from books.)



ANNUAL INDEX 2003

SUBJECTS

TOR EIGELAND

TITLES

AUTHORS

SAMIA EL-MOSLIMANY

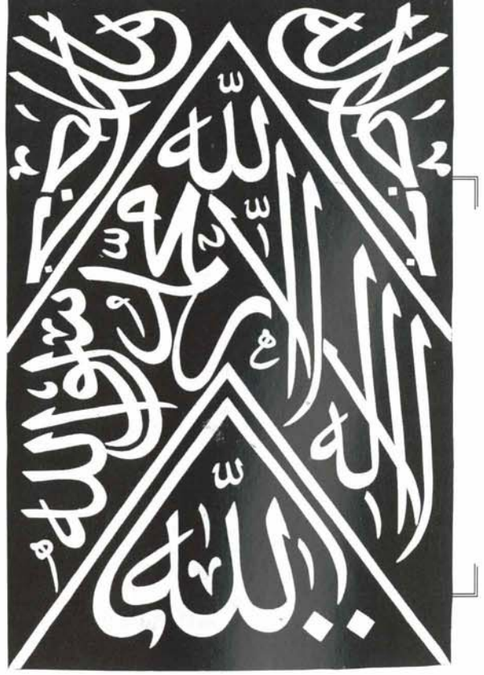
PHOTOGRAPHERS

ILLUSTRATORS

INSTITUTIONS

Events&Exhibitions

Urban Islam offers a look at contemporary Islam in five cities: Paramaribo, Surinam; Dakar, Senegal; Marrakech; Istanbul; and Amsterdam. Young Muslims in the first four cities discuss how they experience their faith and talk about their lifestyle and youth culture—pop music, fashion, television and new media. In the Amsterdam section, people with diverse backgrounds in The Netherlands express their ideas about Islam on-screen, providing a continuous record of public opinion. The exhibition also provides background information about Islam, with explanations of its basic principles, illustrated with classical Islamic objects, including beautifully decorated copies of the Qur'an and 18th-century miniatures from Iran. In addition, different views on Islam are discussed extensively on www.urbanislam.nl. KIT Tropenmuseum, **Amsterdam**, through September 12.



A tapestry by Egyptian artist Ashraf Hasem features the *shahada*, the Muslim profession of the faith, in the central chevron.

<<< January

Homelands: Baghdad–Jerusalem–New York is a retrospective of the sculpture of Baghdad-born artist Oded Halahmy which combines abstract elements with organic forms. Halahmy's monumental but engaging sculptures originate in modernist attitudes but pay homage to the art of the ancient Middle East, existing between abstraction and representation. Yeshiva University Museum, **New York**, through January 15.

Beauty Under Siege: Iraqis, Palestinians, Afghans is an exhibition of black-and-white photographs by Alan Pogue. ⓘ www.vervefinearts.com. Verve Fine Arts, **Santa Fe, New Mexico**, January 16 through February 29.

Arms and Armor: Notable Acquisitions 1991–2002 celebrates additions to the Arms and Armor Galleries that have significantly enriched the collection of European, North American, Japanese and Islamic arms. Metropolitan Museum of Art, **New York**, through January 18.

Eternal Egypt: Masterworks of Ancient Art from the British Museum displays some 150 pieces spanning 3000 years of Egyptian history. The exhibition includes colossal sculptures—such as the three-ton red granite Lion of Amenhotep III and a large standing statue of Ramesses the Great—as well as masterworks in wood, terra-cotta, gold, glass, bronze and papyrus. ⓘ www.thewalters.org. Catalog. Walters Art Museum, **Baltimore**, through January 18.

City of Sardis: Approaches in Graphic Recording features images of Sardis in western Turkey ranging from 18th-century pencil and ink to computerized renderings. The city, capital of the Lydian kingdom in the seventh and sixth centuries BC, has been the focus of a 45-year study by the Harvard University Art Museums and Cornell University. Catalog. Fogg Art Museum, **Cambridge, Massachusetts**, extended through January 18.

The Hunt for Paradise: Court Arts of Safavid Iran 1501–1576 explores the origins and evolution of the distinctive Safavid style that emerged during the first half of the 16th century. The show focuses on the great hunting carpet by Ghyas al Din Jami in the Poldi Pezzoli Museum and includes other carpets, ceramics, metalwork, lacquer and hardstones, as well as important examples of miniatures, bindings and other arts of the book. **Persian Silks of the Safavid Period** will be displayed at the Metropolitan Museum of Art, **New York**, through February 29 to complement the Asia Society exhibition; in **Milan**, the exhibition will be enriched by loans from Iranian collections. Asia Society, **New York**, through January 18; Poldi Pezzoli Museum, **Milan**, February 23 through June 28.

From Delacroix to Renoir: The Painters' Algeria is part of a program of events celebrating "Djazaïr: Algerian Year in France" through the works of artists such as Algerian-born Eugène Delacroix. Institut du Monde Arabe, **Paris**, through January 18.

From Delacroix to Matisse: Drawings from the Algiers Museum of Fine Arts features a selection of drawings highlighting Orientalist artists of the 19th and early 20th centuries, including Delacroix and some of the leading exponents of French drawing of the time. The exhibition is also part of "Djazaïr: Algerian Year in France." Catalog and documentary film. Musée du Louvre, **Paris**, through January 19.

Between Legend and Reality: Modern Art from the Arab World features artworks by artists from 16 Arab countries: Algeria, Bahrain, Egypt, Iraq, Jordan, Qatar, Lebanon, Libya, Morocco, Palestine, Saudi Arabia, Sudan, Syria, Tunisia, the United Arab Emirates and Yemen, selected from the permanent collection of the Jordan National Gallery of Fine Arts. **Reykjavik [Iceland]** Art Museum, through January 19.

Children's Stories from Lebanon and Palestine by Praline Gay-Para and Salim Daw will be read as part of activities to mark the opening of a new Islamic Arts Department at the Musée du Louvre, **Paris**, January 21.

The Ardabil Carpet: A 16th-Century Masterpiece Conserved marks the return of the huge carpet, created during Iran's Safavid Dynasty (1501–1732), from the Royal Palace Textile Conservation Studios at Hampton Court, London. The renowned silk and wool carpet is so finely worked that it probably required six weavers working side by side, possibly in Tabriz, at least four years to complete. **Los Angeles** County Museum of Art, January 22 through May 11.

Rug Weaving Traditions of Persia is the title of a talk January 24 at 2:30 p.m. Other programs include Rug and Textile Appreciation Mornings for Southwest Persian Tribal Rugs on January 31, and for Flatwoven Rugs and Textiles from the Caucasus on February 28. Both events are at 10:30 a.m.; visitors may bring clean and well-vacuumed examples relating to the title of the program. "Gabbeh," a 1996 Iranian film that is a romantic ode to beauty, nature and the textile arts, will be screened free of charge March 20 at 10:30 a.m. and 2:30 p.m. Reservations required. Textile Museum, **Washington, D.C.**

The Continuous Stroke of a Breath: Calligraphy from the Islamic World portrays the art of ornamental writing that is the quintessential visual expression of the Muslim faith. Arabic script, the medium of this expression, evolved into a powerful and flexible form of esthetic and spiritual art. Muslim scribes were inspired to improve the legibility and artistic qualities of this script by the need to preserve and disseminate the Qur'an. Over time, calligraphy spread from the written page to become a major decorative element in virtually every medium of Islamic art. The exhibition takes its title from a traditional expression that likens the movement of the pen in a master calligrapher's hand to the flow of breath in his body. Included are masterpieces of calligraphy from the ninth through the 20th century from Arab, Indian, Persian and Turkish regions of the Islamic world. Related lectures will be given January 24, February 28 and March 13 at 11:30 a.m.; "Ancient Writing, Ancient Signs" will be presented for children ages 6 to 11 March 20; and "Infinite Potential: Islamic Calligraphy in the 20th and 21st Centuries" will be presented April 17. Sackler Museum, **Cambridge, Massachusetts**, through July 18.

Veil is a touring exhibition that examines the veil as a symbol in contemporary culture through the selected and commissioned work of 20 artists and filmmakers. The show explores the roles of photography, film and video as modern tools for addressing notions of the veil. Museum of Modern Art, **Oxford, England**, through January 25; Kulturhuset, **Stockholm**, February 20 through May 2.

Creswell's Cairo: Then and Now is a joint exhibition of photographs from the Creswell Collection and the Islamic Art Network Photo Archive. The Rare Books and Special Collections Library and the Sony Gallery for Photography, Adham Center, American University in **Cairo**, through January 29.

The Lila Acheson Wallace Galleries of Egyptian Art feature several new galleries following reconstruction. The work includes the reconfiguration of the architecture of the tombs of Pernab and Raemkai (ca. 2350 and 2440 BC) to more closely resemble their original settings. Metropolitan Museum of Art, **New York**, opening January 29.

Draped, Wrapped and Folded: Untailored Clothing highlights how simple, untailored clothing can reveal a great deal about both the wearer and the culture from which the clothing originates. While some cultures prefer to make highly tailored garments that echo the human form, others favor rectangular lengths of cloth worn draped, wrapped or folded about the body. Despite the latter's simplicity of form, the design and decoration can reflect a high degree of visual complexity and artistic expression, and pieces are often deliberately crafted with the outfit's three-dimensional appearance in mind. The exhibition will also explore how clothing often communicates information about social distinctions within a culture. It features 19 garments from around the world, including Tunisia and Indonesia. Textile Museum, **Washington, D.C.**, January 30 through June 6.

The Films of Abderrahmane Sissako, a series focusing on the work of the Mauritanian-born, Malian-raised filmmaker, explore themes of exile and return, place and identity. Documentaries by other filmmakers included in the series broaden the discussion and offer alternative views. All screenings are followed by a moderated discussion. National Museum of African Art, **Washington, D.C.**, January through March.

Spirit of Islam: Experiencing Islam through Calligraphy is a website introducing visitors to the esthetics, spirituality and educational principles of the Muslim world through the time-honored art of calligraphy. It is based on the eponymous exhibition held in 2001 and 2002 at the Museum of Anthropology at the University of British Columbia in Vancouver. Educational additions to the website, such as lesson packages for high school teachers, are expected to be completed in January. Corrected URL: **www.moa.ubc.ca/spiritofislam**.

2004 Festival of Iranian Films features five new works focusing on journeys large and small. They include "Marooned in Iraq," where characters find both hope and humor in travels through landscapes reeling from the effects of war; in "Crimson Gold" and "Ten," the characters confine their movements to Tehran, where they become metaphorical journeys within themselves. All films are in Farsi with English subtitles. Freer Gallery, **Washington, D.C.**, January and February.

<<< February

Code of Hammurabi Room, newly reopened, houses not only the centerpiece black stele on which the code is recorded, but more than 500 other objects including the bronze lion, the mural paintings of Mari and the statues of Eshnunna. King Hammurabi made Babylon (in what is now southern Iraq) his political, intellectual and religious capital when he ruled Mesopotamia in the 18th century BC, and his law code is a principal work in Babylonian literature. To celebrate the reopening, the Pergamon Museum of Berlin has lent a large cuneiform tablet inscribed with Assyrian legal decisions, on display beside the code until February 2. Musée du Louvre, **Paris**.

Chocolate, Coffee, Tea focuses on the utensils developed to serve these drinks that were introduced into 17th-century Europe as the result of sustained seagoing contacts with the Arab world, China and Mexico. Metropolitan Museum of Art, **New York**, February 3 through July 11.

The Aga Khan Lecture Series: A Forum for Islamic Art and Architecture will present: "The Ways of Learning About Islamic Art" (February 5); "Paintings and Politics in 17th-Century Iran: A New Interpretation" (February 26); "Authenticity and Identity in Crusader–Islamic Visual Encounters" (March 18); "In and Out of the Orientalist Genre: The Representation of History in the Paintings of Osman Hamdi Bey" (March 25); and "Encounters With and Beyond Empire: Urban Imagination in Ottoman Travel Writing" (April 17). The free lectures are at 5:30 p.m. 617-495-2355. Sackler Museum, **Cambridge, Massachusetts**.

Faces of Iraq is a traveling exhibition that includes 55 color and black-and-white prints by various photographers that portray the human spirit and diversity of the people of Iraq. Cambridge Multicultural Arts Center, **Cambridge, Massachusetts**, through February 6.

Archeological Research on Oriental Antiquities lectures include: "The Political Geography of the Near East: The Point of View of the Ancient Egyptians" (February 6); "The Royal City of Mari" (February 27); and "Terra-Cotta Figurines of Susa" (May 28). Egyptian Antiquities conferences include: "New Ruins of Abydos: The Monuments of Pharaoh Ahmosis and his Family" (June 7) and "The Discovery of Heraklion of Egypt in Aboukir Bay" (June 24). Musée du Louvre, **Paris**.

Empire of the Sultans: Ottoman Art from the Khalili Collection explores the influence of the Ottoman sultans on affairs of state and religion with displays of calligraphy, Qur'anic and other manuscripts, arms and armor, metalwork, ceramics, textiles and scientific instruments from the Khalili Collection of Islamic Art. Catalog. Frick Art and Historical Society, **Pittsburgh**, through February 8; **Worcester [Massachusetts]** Art Museum, March 6 through May 16.

Haj Youness and the Voices of Wisdom Orchestra features performances by the internationally known *'ud* (lute) player who is director of the National Conservatory of Music in Casablanca, Morocco. The program highlights the Moroccan, Arabic, Judaic and sub-Saharan roots of contemporary Moroccan music. National Museum of African Art, **Washington, D.C.**, February 14.

Porphyry, the Purple Stone: From Ptolemy to Bonaparte focuses on the purplish-red rock first quarried in Egypt in the Ptolemaic era and its special role in architecture and sculpture from the Hellenistic period to the late 18th century. The stone's extraordinary hardness, the imperial monopoly on its exploitation and, above all, its royal color—for which it is named—bestowed a precious character and a remarkable symbolism upon it. In the medieval mind, it was linked to the Emperor Constantine and to the grandeur of Rome, and its use by Carolingian rulers, popes and the Norman kings of Sicily thus had political implications. Workshops for children will be held February 14 and 16, supported by an exhibit publication entitled "The Secrets of the Purple Rock." Musée du Louvre, **Paris**, through February 16.

Bravehearts: Men in Skirts places the fashion of western men wearing what is often considered women's clothing in historical and cross-cultural context. The exhibition of more than 100 items shows how designers have looked to Asian, African and Oceanic cultures, and exhibits garments including the Middle Eastern and North African caftan or djelleba, the Japanese kimono and the South Asian sarong as sources of inspiration and legitimization. Metropolitan Museum of Art, **New York**, through February 8.

The Legacy of Iraq: The Looting and Loss of Cultural Heritage is the title of a lecture by Dr. Erica Ehrenberg, the dean of the New York Academy of Art. 7 p.m. Speakers Auditorium, Georgia State University Student Center, **Atlanta**, February 10.

A Woman's Treasure: Bedouin Jewelry of the Arabian Peninsula features more than 100 pieces, including jewelry, headdresses, earrings, bracelets, necklaces, coffee urns, incense burners and other artifacts in gold, silver and brass. The craftsmanship and design of the pieces reflect a variety of cultural referents, both social and religious, and reveal the significant roles played by jewelry in the lives of nomadic women of the Peninsula—as dowry, talisman and endowment. Bead Museum, **Glendale, Arizona**, through February 15.

Sumerians Among Us: Cultural Continuity and the Geopolitics of the Future is a lecture about how history, especially the study of prototype civilizations such as ancient Sumer, can serve as a guide in framing the future. Stephen Young, head of the US Defense Threat Reduction Agency, will discuss what fundamental ideas are shaping society and discuss why western culture may be at a turning point that could make the next century the most significant since the decline of Sumer around 2000 BC. University of Pennsylvania Museum of Archaeology and Anthropology, **Philadelphia**, 4:30 p.m. February 19.

Portraits without Names: Palestinian Costume focuses on 200 years of costume and embroidery. **Bathurst** Regional Gallery, **NSW, Australia**, February 20 through April 12.

A Woman's Way: Feminine Attire in 20th-Century Morocco provides an introduction to the distinctive quality of women's clothing, showing Berber, Arab and Jewish influences. More than 50 textiles demonstrate many of the changes that occurred during the last century in Morocco, a country where cultural traditions place a high value on the art of individual artisans. The display includes 11 mannequins dressed in full ensembles of clothing and jewelry. It points out the differences between the clothing in urban and rural areas; textile representations range from the Rif Mountains in the north to the desert areas of the south, as well as inland and coastal cities. **Minneapolis** Institute of Arts, through February 21.

Love and Yearning: Mystical and Moral Themes in Persian Poetry and Painting displays 26 finely illustrated manuscripts demonstrating how artists from the 15th to the 17th century transformed the rich imagery of Persian lyrical poetry into stylized, detailed and colorful images. Manuscripts include pages from Nizami's *Khamsa (Quintet)*, Jami's *Haft Awrang (Seven Thrones)*, and *Bustan (Orchard)* and *Gulistan (Rose Garden)* by Sa'di. ⓘ ww.asia.si.edu, 202-357-2700. A Family Festival of Poetry, including dance, films and storytelling, complements the exhibition on February 14. Sackler Gallery, **Washington, D.C.**, through February 22.

Isfahan: Half the World is part of a yearlong lecture series on "Cities, Their Art and Architecture." After the lecture, participants may dine at the Harvard Faculty Club, where a dish inspired by the cuisine of the city will be served. (Reservations required.) 6:30 p.m., Norton Hall, Harvard University, **Cambridge, Massachusetts**, February 25.

The Quest for Immortality: Treasures of Ancient Egypt presents coffins, masks, jewelry, papyri, sarcophagi and sculpture from Cairo's Egyptian Museum. An IMAX film, "Mysteries of Egypt," and a planetarium program, "Stars of the Pharaohs," are shown in conjunction with the exhibit. **New Orleans** Museum of Art, through February 25; **Milwaukee** Public Museum, March 28 through August 8.

Fountains of Light: Islamic Metalwork from the Nuhad Es-Said Collection presents 27 inlaid metal objects from one of the finest private collections of its kind. The objects, created between the 10th and the 19th centuries in lands encompassing present-day Iran, Iraq, Syria, Afghanistan, Egypt, Saudi Arabia and Turkey, are on view for the first time in the US. Of particular note are 13th- and 14th-century works from Egypt and Syria, and two 13th- and 14th-century keys commissioned for the Ka'bah in Makkah. Sackler Gallery, **Washington, D.C.**, until February 29.

Courtly Arts of the Indian Subcontinent are displayed in an installation depicting a maharajah's

TROPENMUSEUM

Continued from previous page

library. Royal portraits from the 18th and 19th centuries and 22 miniature paintings are on display, along with ivory figures, an embroidered tent hanging and a marble table inlaid with semiprecious stones, all in the Mughal style. **Newark [New Jersey]** Museum, through February.

Breaking the Veils: Women Artists from the Islamic World presents the work of 51 female artists from across the Muslim world. The continuing exhibition aims to break the stereotypes of Muslim women and includes 63 paintings and etchings in a variety of genres. The artists themselves reflect the mixed faiths and cultures with the 13 Islamic countries represented in the show. Co-organized by the Royal Society of Fine Arts, Jordan, and FAM (Femme Art-Mediterranean). Foundation Laboratorio Mediterraneo, **Naples**, February and March.

March >>

Golden Thread Productions, a theater organization that explores Middle Eastern culture and identity as represented around the globe, is seeking short plays for consideration in ReOrient, an annual festival of works by playwrights from, or with themes concerning, the Middle East. ⓘ information@goldenthread.org. Deadline: March 1.

Asian Games: The Art of Contest will explore the role of games as social and cultural activities in the diverse societies of pre-modern Asia. The exhibition comprises 120 to 150 artworks, including spectacular examples of game sets dating from the 12th to the 19th century, Persian and Indian court paintings, and illuminated manuscripts. Sackler Gallery, **Washington, D.C.**, March 5 through May 22.

Memento: Muriel Hasbun Photographs features the work of a woman of Palestinian and Jewish heritage, raised as a Catholic in Latin America, who uses her family history as an inspiration for her layered, collage-like images. Corcoran Gallery of Art, **Washington, D.C.**, March 6 through June 7.

Treasures from the Royal Tombs of Ur returns to its Philadelphia home for a limited engagement following a five-year, 10-city tour and before traveling to additional sites. The show features more than 200 Sumerian treasures revealing traditions of royal life and death, excavated in the 1920's by Sir Leonard Woolley. They include the famous "Ram in the Thicket"—a statuette of a goat nibbling the leaves of a tree—jewelry, a comb, a wooden lyre decorated with a gold-and-lapis bull's head, games, furniture, seals and vessels of gold, silver and alabaster, many found in the intact tomb of a woman—a queen or high priestess—named Pu-abi who died between 2600 and 2500 BC, a high point of Sumerian culture. Catalogue $75/$50. University of Pennsylvania Museum of Archeology and Anthropology, **Philadelphia**, March 13 through September.

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Secret Gardens of the Wild displays porcelain sculptures, plaques and botanical paintings by artist-explorer Patrick O'Hara inspired by the rare wildflowers and medicinal plants he has studied on travels across the Muslim world from Morocco to Pakistan and beyond. O'Hara has viewed Arabian desert flora in Saudi Arabia, Oman and the United Arab Emirates, as well as desert plants from Texas, New Mexico, Arizona and California. In most of those places, he has also lectured to students and to arts and science societies about his work and about plant conservation. Fota House, **Fota Island, County Cork, Ireland**, May 14 through June 1.

A watercolor featuring *Periploca aphylla* (handabub) in the Hajar Mountains of Oman.

Byzantium: Faith and Power (1261–1557) focuses on the artistic and cultural significance of the last centuries of the Byzantine Empire. The exhibition explores the impact of its culture on the Islamic world and the Latin-speaking West. It begins in 1261, when Constantinople was restored to imperial rule, and concludes in 1557, when the empire that had fallen to the Ottoman Turks in 1453 was renamed Byzantium. Catalog. Metropolitan Museum of Art, **New York**, March 23 through July 4.

Heaven on Earth: Art from Islamic Lands provides a dazzling introduction to the art and artifacts of the Islamic world. The majority of the exhibits are drawn from the Hermitage Museum in St. Petersburg, Russia, supplemented by exhibits from the Khalili Collection in London. The show features masterpieces representing the finest decorative arts of Islam, including textiles, jewels, metalwork, ceramics and paintings dating from the Middle Ages up to the 19th century and drawn from an area stretching from Spain, across the Arab world to Persia and the Indian subcontinent. Somerset House, **London**, March 25 through August 22.

The Seventh American Conference on Oriental Rugs will feature an educational program, exhibitions, workshops, demonstrations and Dealers' Row. ⓘ www.acor-rugs.org. Bell Harbor International Conference Center, **Seattle**, March 25–28.

April >>

Teachers' Institutes on Understanding and Teaching about Islam will be offered in two-week sessions during the summer. Classes on Islamic faith, practice, history and culture will be taught by university professors from the United States and abroad. Participants will become more familiar with teaching resources and techniques for integrating them into social studies, religion or world-history curricula. College credit is available. ⓘ 505-685-4584, kdalavi@cybermesa.com. Application deadline April 5. Dar al Islam, **Abiquiu, New Mexico**.

Timeless Connections: Exploring Tapestry Weave demonstrates the broad geographic dispersion and historical continuity of one of the world's oldest and most versatile textile techniques. The exhibition includes Tunisian and Iranian kilims, Egyptian Coptic material and objects from Mali. Textile Museum, **Washington, D.C.**, April 16 through August 1.

Sacred Scripts: World Religions in Manuscripts and Print draws on the finest examples in the University Library of sacred manuscripts from all over the world. It includes magnificent illuminated copies of the Qur'an, fine illustrated Bibles and printed Buddhist texts from the eighth century AD, the latter among the earliest datable printed documents in the world. **Cambridge [England]** University Library, through April 24.

Secret Splendors: Women's Costume in the Arab World. **Noosa** Regional Gallery, QLD, **Australia**, April 30 through June 14.

May >>

Caliphs and Kings: The Art of Islamic Spain features some 90 objects from the collection of the Hispanic Society of America demonstrating the longevity, continuity and transmission of the Islamic decorative arts and sciences of medieval Spain. The exhibition presents works dating from the time of the Muslim conquest of the Iberian Peninsula in the eighth century to the final phase of Muslim life in Spain in the 16th century, including objects from 10th-century Córdoba and 14th- and 15th-century Granada. Sackler Gallery, **Washington, D.C.**, May 1 through October 17.

Antoin Sevruguin and the Persian Image offers a glimpse of turn-of-the-20th-century Iran though the eyes of one of that country's most creative photographers. Sevruguin moved effortlessly back and forth between Iran and Europe, in the process creating a diverse body of photographic work that oscillates between East and West in its subject matter—veiled women, the shah, court life, western tourists and commoners—and its approach: portraiture, archeological studies and street scenes. Gallery talk April 29, 12 p.m. Williams College Museum of Art, **Williamstown, Massachusetts**, through May 2.

Forbidden Image: Persian and Mughal Painting from the Collection complements the Sevruguin exhibition above, treating the complex and disputed issue of representing people in Islamic art. The exhibit's 12 paintings and drawings from the 15th through the 19th century depict a variety of men and beasts and reflect Sevruguin's study of traditional Persian painting, which influenced his photography. Williams College Museum of Art, **Williamstown, Massachusetts**, through May 2.

Charles Prendergast and Persian Paintings shows how the American artist experimented with techniques and media he admired in Persian painting. Williams College Museum of Art, **Williamstown, Massachusetts**, through May 2.

June >>

Steel: A Mirror of Life in Iran features some 400 objects from the renowned Tanavoli collection and a number of items from the Library's collection of Persian miniatures and manuscripts. Steel was an integral part of the economic, social and religious life in Iran during the Safavid and Qajar periods (16th to early 20th centuries). Through the display of more than 300 intricately decorated items of steel—tools and implements used at home, in the bazaar, in war and for ceremonial occasions, for religious purposes, and for horsemanship and entertainment—the exhibition tells the story of traditional life in pre-modern Iran. Almost every item, no matter how mundane and pragmatic its function, is itself a work of art, an example of the exquisite workmanship of the traditional Iranian craftsman. The exhibition will be held in conjunction with a conference on metalworking in Islamic Iran September 3–4. ⓘ www.cbl.ie/whatson. Chester Beatty Library, **Dublin**, June 2 through September 15.

Later >>

Luxury Textiles East and West: Dress and Identity celebrates the 50th anniversary of the Museum's costume and textiles department with the second part of a tripartite presentation highlighting more than 75 items dating from the 14th through the 20th centuries, including an Ottoman sultan's ceremonial barbering apron, a Mughal velvet tent and an Indonesian gilded wedding skirt. **Los Angeles** County Museum of Art, through July 5.

Luxury Textiles East and West: Opulent Interiors celebrates the 50th anniversary of the Museum's costume and textiles department with the third part of a tripartite presentation highlighting more than 75 items dating from the 14th through the 20th centuries, including an Ottoman sultan's ceremonial barbering apron, a Mughal velvet tent and an Indonesian gilded wedding skirt. **Los Angeles** County Museum of Art, August 26 through July 10, 2005.

Spanish Sculpture and Decorative Arts: 1500–1750 offers 85 works of art showing the varied strands of influence—Islamic, Flemish and Italian—that contributed to the vibrant material culture of Spain from the early 16th to the mid-18th century. Metropolitan Museum of Art, **New York**.

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, permanent.

Information is correct at press time, but please reconfirm dates and times before traveling. Most institutions listed have further information available through the World Wide Web. Readers are welcome to submit information for possible inclusion in this listing.

A photographer's credit was omitted on page 5 of the article "History's Curve," in our July/August 2003 issue. Daniel S. Glover took photographs 1 through 5 at the Grayson Archery Collection of the Museum of Anthropology of the University of Missouri–Columbia, as well as the other photograph on that page showing bow cross-sections. We apologize for this omission and extend our thanks to the Museum for its assistance in the research supporting "History's Curve." The Museum's website is **http://coas.missouri.edu/anthromuseum**

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