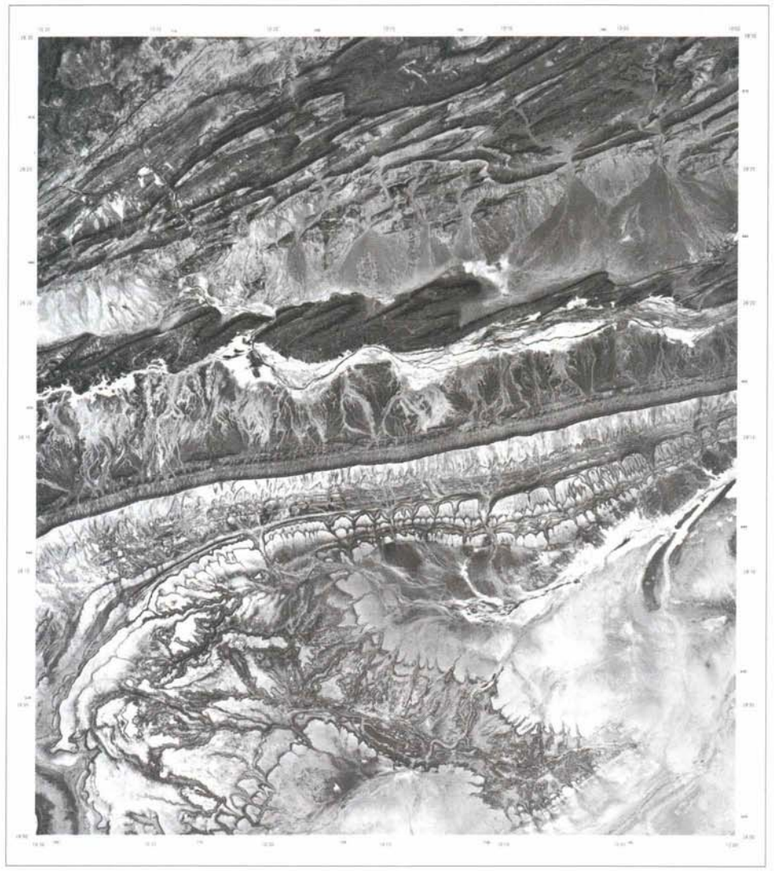

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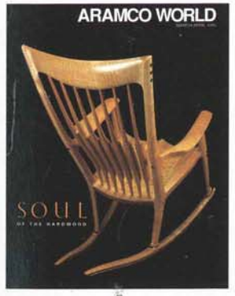

Front cover: With its mellow, gleaming curves like frozen honey, one of Sam Maloof's famous hand-crafted rocking chairs seems to beg to be touched, and offers balance, comfort and relaxation in return. Museums and lucky private buyers collect Maloof's furniture. Photo by George Baramki Azar. Back cover: From satellite heights, western Morocco's rugged landscape softens to look like marbled paper. The Drâa Valley cuts across the image. Photo courtesy of IGN.

◀ Jabaliyyah Bedouins walk long distances to tend their walled and treasured mountain gardens.

ARAMCO WORLD

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The Desert Meets the Sown

Come...with me along some strip of herbage strown
That just divides the desert from the sown
Where name of slave and sultan scarce is known....

The Rubaiyat of Omar Khayyam

WRITTEN BY LYNN TEO SIMARSKI
PHOTOGRAPHED BY MOHAMMED BIN SALIM AL-WADHAHY
AND LYNN TEO SIMARSKI

On the inland side of the great mountainous backbone of the Sultanate of Oman, where sands lap at the thresholds of farmlands, a string of border towns marks the zone of transition between nomadic and settled peoples. Historians, writers and travelers to the Middle East have often stressed the conflict between these two ways of life. In the oasis villages of Oman, however, from Buraymi in the north to Mintirib in the south, desert and village economies have mingled for ages to their mutual benefit.

The interdependence of desert and sown in Oman, and the transition between the two, is encapsulated in Sanaw, a town in the Sharqiyyah region southeast of the mountain stronghold. Here, in one of the most isolated areas of the country, rise the Wahibah Sands, a 12,000-square-kilometer (4,650-square-mile) sand sea. Sanaw is one of the six market centers on this desert's northern rim that serve the Bedouin dwellers of the Sands.

The economy of the Wahibah Sands region embraces complex interactions among three main occupations: cultivation, herding and fishing. These ways of life, along with the physical geography and biology of the region, were the objects of intensive study from 1985 to 1987 by the Oman Wahiba Sands Project of the Royal Geographical Society of London (See *Aramco World*, January-February 1988). As the project's studies detail, the irrigated oases of the towns support traditional agriculture, dominated by the date palm, as well as new farms for the production of alfalfa and some fruits and vegetables.

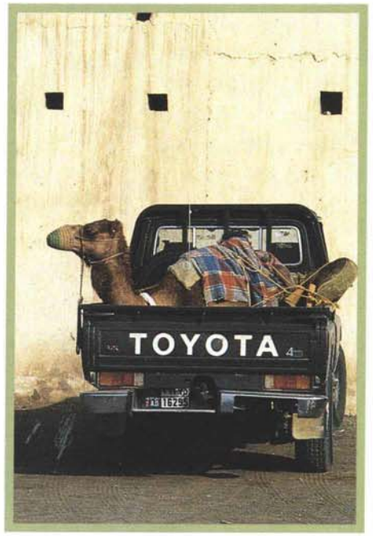
Living within and along the Sands are approximately 3000 pastoralist Bedouins who are mainly herders of goats and camels. The Bedouins belong to six principal tribes: the Al Wahibah—by far the largest—the 'Amr, the Hikman, the Mawalik, the Al Bu 'Isa and the Janabah. On the Sands' southeastern edge, Bedouin fishermen populate a number of villages scattered along the coast of the Arabian Sea.

The Sanaw market (opposite), links the economies of town-dwellers and nomads (above), and the needs of both groups are met.

Sanaw's busiest market day is Thursday, and other towns in the region schedule their markets for other days—a practice that allows merchants to travel from one market to another.

These people migrate to the northern oases in summer, where some of them participate in the date harvest.

Sanaw's bustling daily market provides a captivating snapshot of the interchange among these different ways of life, which are still pursued in the age-old way to a greater extent here, perhaps, than in most other places on the Arabian Peninsula. The Thursday market, which begins early in the morning, is particularly animated. Here, Bedouins, fishermen and villagers convene in the large square delineated by permanent shops selling jewelry, clothing and food. In the square is an inner, roofed area used for animal sales and special auctions.



Once indispensable to the transport of goods and people, the camel is itself increasingly transported, and regarded as an investment as well as a source of milk, hair, meat and more camels.

Just outside the market, hobbled camels kneel in the back of the Bedouins' pickup trucks, waiting to be sold. Camels are mainly the concern of men, and the breeding of racing animals is a growing source of cash.

The inner market square frequently features a brisk goat auction. Because raising goats is often the women's preserve, many women crowd among the spectators here. An auctioneer keeps up the pace, orchestrating the action with his camel stick. Bidders and watchers scrutinize and trade jibes as the animals are marched around, one by one, for inspection. Most goats are the brown or black type typical of northern Oman, although the smaller, southern goats and the sleek, white, short-haired Somali goats also appear for sale. The bidding soars highest for the local type. Sometimes a trader will buy a large lot for export to the United Arab Emirates.

Roving hawkers weave through the crowd, shouting the latest price for the popular *khanjar*, the curved Omani dagger whose hilt, sheath, and belt are all covered with lavish silver work, or for the hooked camel-sticks often carried by Omani men. Prospective buyers carefully weigh and flex these sticks in their hands before making an offer.

Other merchants sit on the ground among mounds of dried fish, the object of a longstanding trade that exemplifies the links among the desert, the oasis, and the sea. Along both the eastern and western margins of the Sands, explains Roger Webster, a scientist who participated in the Wahiba Sands Project, Bedouin groups occupy positions astride the transit routes along which fish is brought from the coast to the northern markets—formerly by camel train, now by truck. In the past, non-Bedouin traders required the services of a Bedouin guard to ensure their safety.

On the edge of the Sanaw market, a craftsman (opposite) fits blade into hilt to complete a *khanjar*, the curved, ornamental dagger worn by Bedouin men of the southern Arabian Peninsula.

Today, as long ago, dried anchovies furnish rich fertilizer for oasis crops. Likewise, the hard, leathery strips of dried shark still provide an easily transported and long-lasting staple for desert life. On a trip through Oman early in this century the British political agent Sir Percy Cox described a Bedouin breakfast of dates and shark. "They cut or hammered off great chunks of the shark meat," he reported, "and after beating it into a fibrous state picked it to pieces and ate it." Cox himself, however, found the meat "very tasteless, and exceedingly tough and stringy." A Sanaw shark-seller, tucking his profits beneath his turban, explains that the dried flesh can be soaked in water to make a sort of stew.

Although the Bedouins pasture their livestock in the Sands and the adjacent plains, they also purchase supplemental fodder such as alfalfa from the oases, as well as the dried sardines, known as *'um*, found in Sanaw market, a practice responsible for the characteristically fishy flavor of their camels' milk. The oases also supply the Bedouins with palm fibers for ropes and fishing equipment, palm fronds for basket-weaving, and the palm ribs they use to construct huts. In turn, the Bedouins market traditional commodities such as salt, camel manure for fertilizing oasis plots, goat-hair products, wool, leather and palm-frond baskets. Some Bedouin women are proficient weavers, and their hand-crafted camel trappings, girth straps, donkey bags, handbags and rugs sometimes appear in the market too.

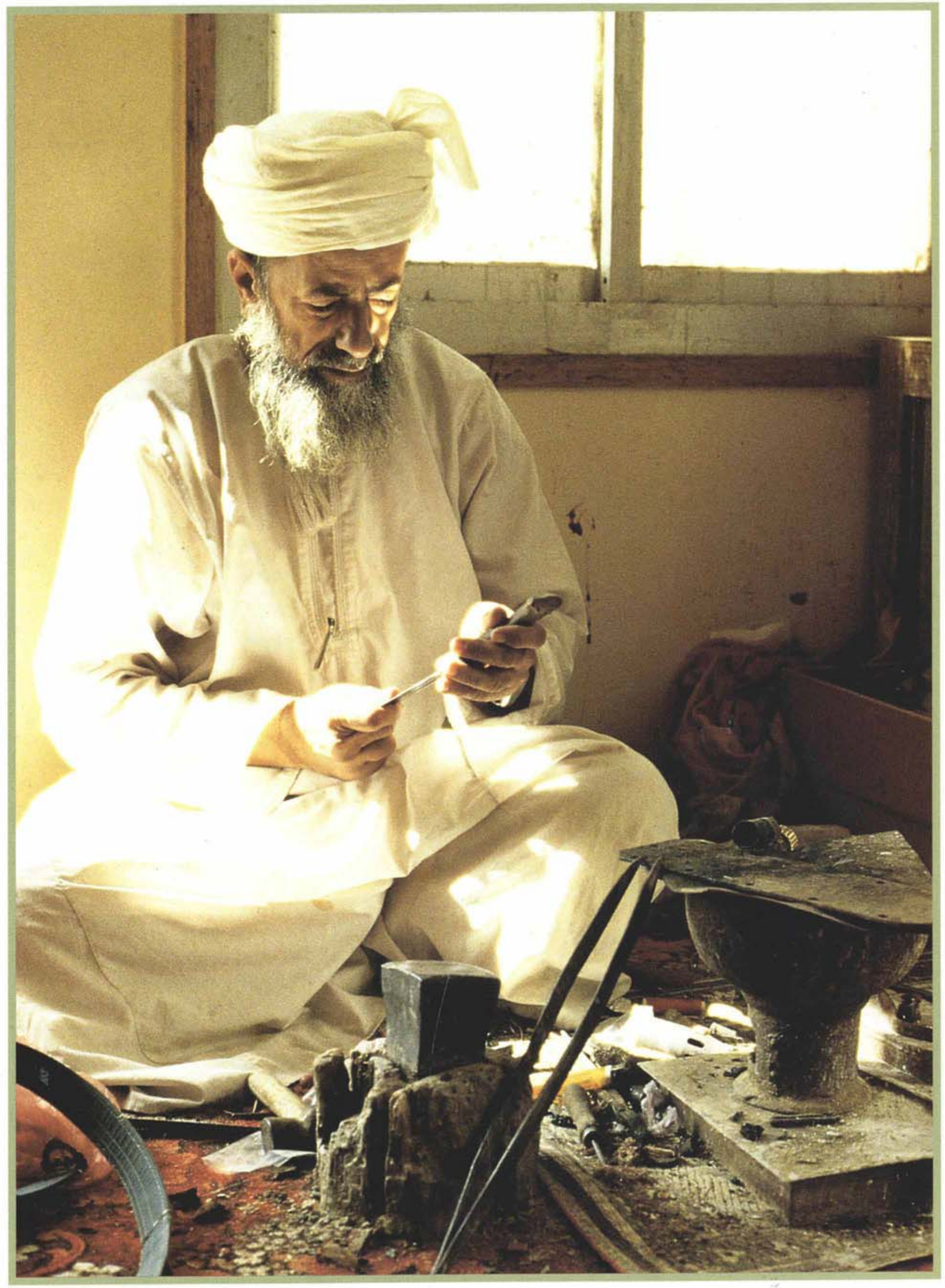
Shore-dwellers and desert-dwellers meet in Sanaw market, trading in strips of sun-dried shark meat, a traditional, long-lasting ration for travelers.

In the tailor shops of the market's outer square, clusters of diminutive, masked Bedouin women finger brightly-colored dresses. These will be worn, outside the house, under the traditional gauzy, black overgârment and topped with a long, wrapped scarf of the same semi-transparent material.

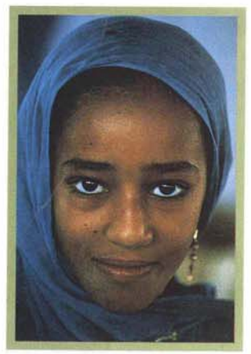
Traditionally, a woman's tribe was indicated by the type of *battulah*, or beaked mask that she wore, explains Dawn Chatty, an Arab-American anthropologist who has lived among nomadic tribes in Syria and Oman. The long masks of Wahibah women extend far down their faces, contrasting with the briefer masks of the Janabah and the Duru'. Now, however, bright purple masks are in vogue among younger Bedouin women, and thus the type and length of mask may identify the wearer's generation as much as her birthplace, Chatty points out.

The relaxed, free-wheeling atmosphere of Sanaw market, rich with gossip about grazing conditions, family and friends as well as with the bartering of commodities, holds a special attraction for the Bedouins. When pastoralists are asked where they sell their goats, says Chatty, they may mention the market of Sanaw as well as those in the towns of Adam or Nizwa. "But they prefer Sanaw above the others," she says. Besides its comfortable desert character, Sanaw is also closer to the Wahibah Sands and easy to reach by following the valleys from the hinterland.

The interaction of people and resources, in the borderlands that Sanaw typifies, has helped to shape not only the history of Oman, of course, but also events throughout the Middle East. Islamic law established the rights of land ownership and use between settled and nomadic peoples, while the theme of desert and sown also sparked the imaginations of writers and travelers. Western travelers such as Charles M. Doughty, T.E. Lawrence, Gertrude Bell and Wilfred Thesiger often treated the theme, usually stressing the distinctness, rather than the interdependence, of the regions.



In Sanaw as elsewhere, camel-handling is a man's domain, not least because camels can be temperamental, and working with them can demand great strength.



Historian Arnold Toynbee found a metaphor for the conflict between settled and nomadic peoples in the story of Cain and Abel, in which the tiller of the ground slays the pastoralist. Toynbee used the story to illustrate "primordial antipathy and misunderstanding between the cultivator and the Nomad." Thesiger, who explored the Empty Quarter of Saudi Arabia some 40 years ago and recorded his adventures in *Arabian Sands*, also took a strict view of the division between the two ways of life. He believed the Bedouins could conquer the settled peoples whenever they wished, and that only their love of the free desert life kept them from doing so.

It was Ibn Khaldun, however, the great Arab historian and philosopher who finished his *Muqaddimah*, or *Introduction to History*, in 1377, who wrote of courageous nomads, fortified by desert life, who were "better able to achieve superiority and to take away the things that are in the hands of other nations.... Whenever people settle in fertile plains and amass luxuries and become accustomed to a life of abundance and refinement, their bravery decreases to the degree that their wildness and desert habits decrease." The Bedouins' victories over settled areas led to the decay of Bedouin civilization, he believed.

Still, Ibn Khaldun recognized the reciprocity between the two modes of life, pointing out that the Bedouins sold livestock and animal products to the cities, which in turn furnished the Bedouins with necessities of life that they were unable to produce themselves—just as they do today. Among those who have studied the modern dynamics of Bedouin and settled life, this interaction has received considerable emphasis. As geographer John C. Wilkinson explains, "The life of the nomad and the oasian form part of a continuum, and all desert societies must include specialists in both forms of existence."

Researcher Angela J. Christie, who studied the market towns as part of the Wahiba Sands Project, wrote that "the pastoral population are dependent upon these communities for...food, clothing, building materials, fodder...and even water, which some transport into the sands by truck."

On the perimeter of Sanaw oasis, as on the edges of similar border towns such as Ibra and Adam, stand the Bedouins' small, palm-frond, or *barasti*, houses, which they inhabit in summer during the date-harvest season. Many herders work in date gardens belonging to settled villagers, explains Christie, who adds that Bedouins now invest in date groves of their own. In some villages, in fact, Bedouins own almost half of the date gardens. Overall, the distinctions among pastoralists, fishermen and cultivators are often blurry. Members of the same tribe may engage in more than one of these occupations, and individuals may participate in one activity or another depending on the season, the activities of other family members or friends, or other circumstances.

Even members of the Harasis tribe, who dwell in the Jiddat al-Harasis, the remote sector of central Oman, visit Sanaw market on occasion. Chatty, who studied the impact of oil development on the Harasis, notes that they have "always been tied, in relations of interdependence, to the sedentary communities.... The Harasis require access to grain, dates, and other agricultural products, and they in turn supply the agricultural communities with livestock."

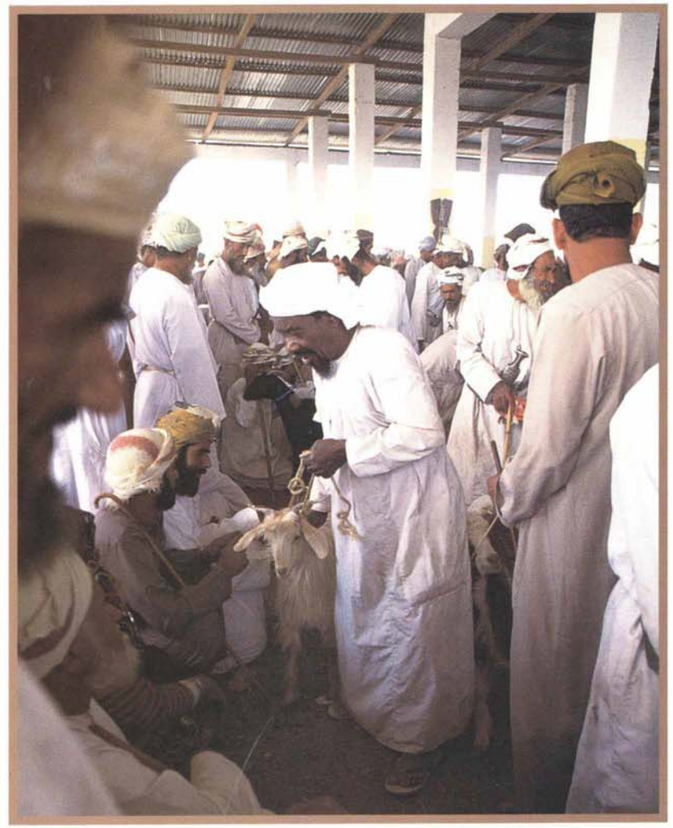
Chatty points out another way in which the model of conflict between desert and sown ill suits Sanaw and its hinterlands. "The tribes never fought over the agricultural land here," she says, calling the fluid, interdependent relationships "a purely economic arrangement. The real struggles were between tribes, and they were over water, but they didn't involve the villages where they trade."

As elsewhere in Oman, change is sweeping swiftly over Sanaw and the other border towns of the Wahibah Sands. Sanaw is now linked by excellent roads to Muscat and much of the hinterland, and has thus become the economic capital of the Sands. The old village up on the ridge has been forsaken for new houses and new shops. The new market increasingly offers imported fruits, vegetables, and dried foods, as well as clothing and toys from many countries that have never before been available.

Thanks to modern transport, fresh fish, too, is available now in Sanaw, and much of the fish caught along the coastline of the Sands is marketed in Muscat, the United Arab Emirates and Saudi Arabia. Furthermore, tribesmen increasingly seek work in Muscat or in other Gulf countries to supplement their families' cash incomes, some of which is invested in the cultivated land of the border oases.

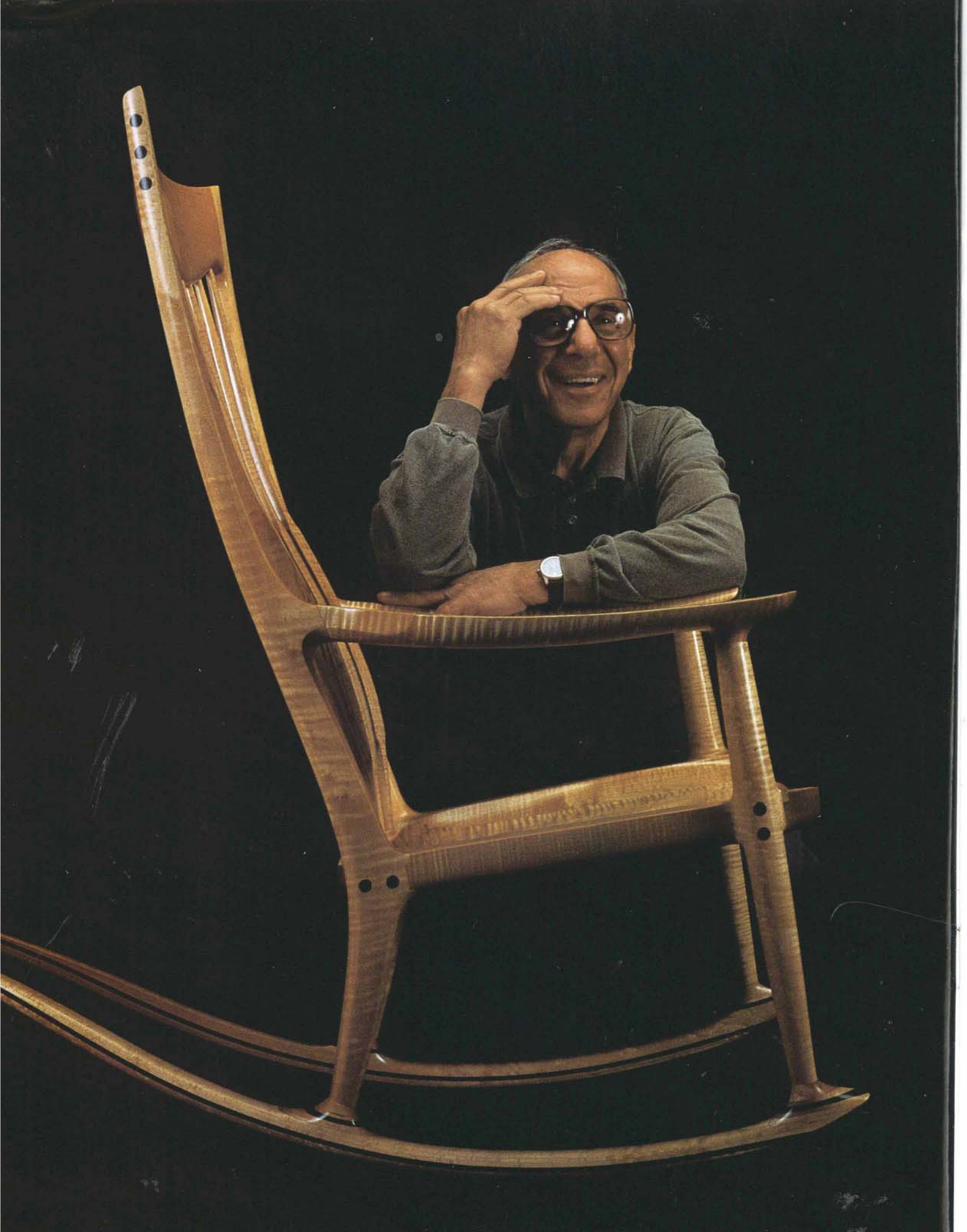
Even the isolated Harasis have been quick to capitalize on the improved transportation. In the past, Chatty recalls, a journey to Adam or Sanaw "was a major undertaking requiring a minimum of one man, several camels and as much as ten days' supply of food and milk to make the round trip." Today, many Harasis families own one or two trucks, and some members work for wages, integrating these new pursuits with their traditional herding.

The greater availability of imported goods in the border towns, where the standard of traditional craftwork is already deteriorating, may lessen the Bedouins' reliance on local products. And as more children attend school, they may eventually be drawn away from the old occupations. At the same time, the tourism potential of the spectacular Sands is also under review by the Omani government. Inevitably, the region "where name of slave and sultan scarce is known" is fast becoming part of a broader world, further interlinking the desert with the sown.



At the center of the Sanaw market, auctioned goats will provide milk, butter and meat to their pastoralist owners.

Washington-based free-lance writer and photographer Lynn Teo Simarski specializes in Middle Eastern topics.



SOUL

OF THE HARDWOOD

WRITTEN AND PHOTOGRAPHED BY GEORGE BARAMKI AZAR

"Ray Charles said he could *feel* that my furniture had soul. His host told him, 'That's a chair made by Sam Maloof.' And Ray said, 'I know this man.... I know this man.'"

When he began working as a furniture-maker in 1948, red oak from railway crates and plywood from construction sites were the only woods Sam Maloof could afford. Now, nearly 1500 handcrafted pieces later, the 79-year-old son of Lebanese immigrants rasps and sands to international acclaim in his workshop east of Los Angeles.

Maloof's crafting of black walnut, rosewood, ebony and teak has earned him a unique place among American master furniture-makers. A Maloof rocking chair, his signature piece, is the first work by a living craftsman ever to be included in the White House collection of American furniture. Maloof's sculptured cradles, chests, tables and music stands also grace the permanent collections of the Smithsonian Institution, the Metropolitan Museum of Art, the Los Angeles County Art Museum and the Boston Museum of Fine Arts.

Though Maloof won a MacArthur Foundation "genius award" in 1985, the same year the California legislature declared him a "living treasure," and although connoisseurs travel around the world to meet him, the most lasting impression Sam Maloof leaves with a visitor is that of a profoundly humble man.

His house is a 22-room historic landmark with an adjoining workshop, all built and furnished by himself.

"A lot of woodworkers have signs that say 'by appointment only,'" says Maloof, who doesn't. "It sounds as though you're so important you can't be bothered, and I don't feel that way. I enjoy the human contact. It's part of the work—only it isn't work, really."

He runs his fingers over the grain of a hand-made table as he talks. Compact and fit, he looks far younger than his years, and moves with the casual ease of a jazz player.

"So much furniture today is so awfully cold—meaningless, really. I feel strongly that one of the most important things about a piece of furniture is the soul the woodworker invested in it," he says.

Maloof was born in Chino, California, in 1916, to Nasif Solimon Maloof and Anise Nader Maloof, who arrived from the mountain village of Douma in northern Lebanon among the first Arabic-speakers in California. Even as a boy, he says, his carved wooden toys astonished his family.

Today, he's still astonishing those who see or use his work. Slip into one of his graceful, long-tailed rocking chairs. Its low hardwood seat is so marvelously shaped and sanded it actually feels soft. The products of four decades of intuition and slow refinement, the cant and proportion of the polished ebony are perfectly formed for the human body. Exquisitely balanced, the chair will rock for four and a half minutes on a single push.

Such perfection commands its price: A Maloof rocker sells for around $12,000.

Asked how he arrived at the design, Maloof claims to have no secrets. "I didn't engineer it or anything. I just did it by feel and by the way the curve looked. I know there are formulas, but a lot of times formulas don't work. It's a process of trial and error, really," he says. "Working toward perfection has to be a part of anything one does. You've got to put yourself into it."

As an entirely self-taught artisan, Sam Maloof's only link to formal training is an honorary doctorate, granted in 1992 by the Rhode Island School of Design.

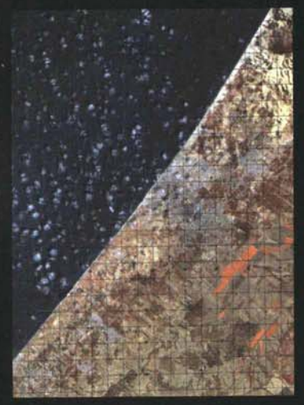
San Francisco photojournalist George Baramki Azar is the author of Palestine: A Photographic Journey, *published by the University of California Press.*

Maps From the Sky

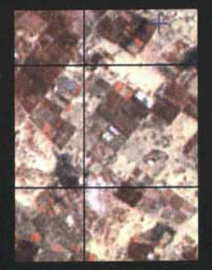
Written by Ian Meadows
Photographs courtesy of IGN

NASA

In a darkened laboratory at



France's National Geographic Institute (IGN) in Toulouse, we watched, fascinated, as the first scan of Gaza and the West Bank came up on the computer screens. The data, showing water resources in bright false color, had been unloaded a short while earlier by a SPOT satellite in orbit 830 kilometers (516 miles) up, tirelessly circling the globe once every 101 minutes.



This space survey had been commissioned by the European Economic Community as a contribution to Palestinian autonomy, and it underscored not only the enormous utility of satellite-gathered space imagery but also its vast potential for cooperative international monitoring of the extent of global resources, their social and economic applications, and the health of Mother Earth in general.

Gaza was by no means the first satellite-survey subject in the Middle East. In the past few years, SPOT Image, together with IGN International, the Institute's commercial arm, has been helping a number of Arab states monitor, inventory and thus rationalize the use of their resources. One important recent mission minutely surveyed the shrinking Nile Delta; another is helping Egypt find potentially habitable desert areas to relieve growing population pressure.

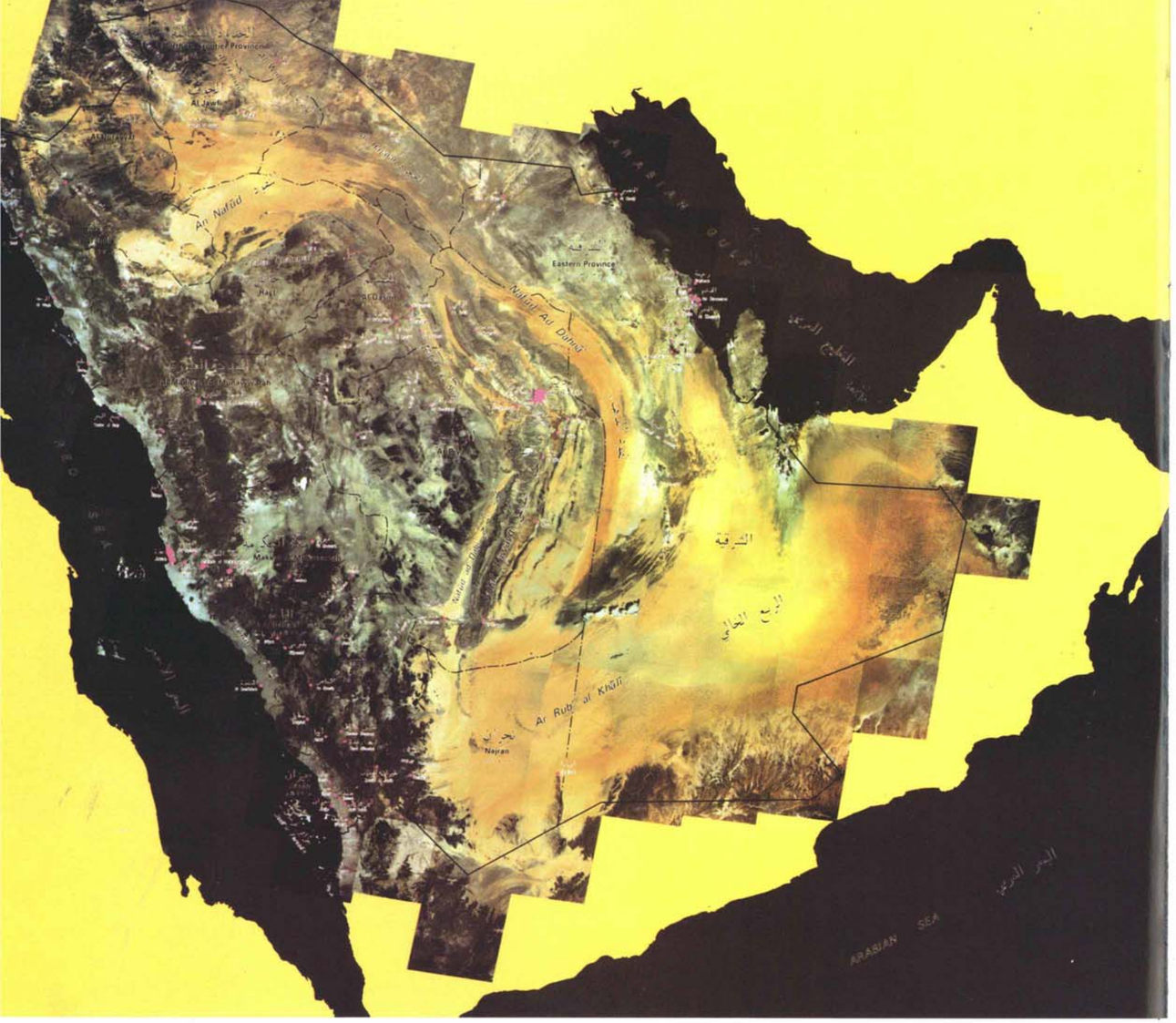
Earlier, there had been mapping projects in Saudi Arabia's Rub' al-Khali, the Empty Quarter in the south and west of the country, and a meticulous 3100-square-kilometer (1197-square-mile) mosaic of Riyadh, the kingdom's thriving capital city. The new jargon of such imaging enterprises, the sophisticated equipment they use, the huge volumes of data they produce, and the dazzling speed at which it's collected, corrected and processed into useful form, all emphasize how effective and powerful this "hands-across-the-sky" cooperation can be.

Toulouse, in southwestern France, where SPOT Image and IGN International have their operational headquarters, is aptly called the European space center. A number of major space and aviation organizations are grouped here, including the industry leader—and parent of both SPOT Image and IGN International—the National Center for Space Studies (CNES).

The first SPOT satellite was placed in orbit eight years ago by an Ariane rocket (See *Aramco World*, March-April 1985), the second was launched in 1992 and the third a few months ago, with two further launches scheduled before the end of the century. But IGN's association with Arab countries began much earlier, in the spring of 1976, when the Institute set up

Riyadh's television broadcast tower casts a long shadow in this image taken for city-planning purposes (right).

The Aswan High Dam bars the course of the Nile and creates Lake Nasser in southern Egypt (left).



Saudi Arabia's deserts, mountains and sedimentary plains show clearly in this photo-mosaic of images from a Landsat multi-spectral scanner.

a training center in Amman and undertook an aerial—that is, non-satellite—scan of 200 Jordanian villages. Since then some 400 engineers have been trained in the Amman center, and it is clear that Jordan's recent data inputs will someday be placed back-to-back with the material from Gaza and the West Bank, as the parties concerned work out how the resources they must share will be divided.

During those early years, before the first SPOT satellite was launched, IGN was frequently commissioned to process data from other sources. In the late 70's, for example, IGN carried out a two-year geodesic survey in Libya using American Landsat data. That and other experience with mapping desert terrain helped the French institute win a contract from Saudi Arabia's Ministry of Petroleum and Mineral Resources to survey the Rub' al-Khali, and the 10-year project, using aircraft and terrestrial methodology, led in turn to the large-scale mapping of Riyadh, intended to support long-term urban and regional planning.

IGN International director René Thomas looks back to those days in Saudi Arabia and calls the decade that he devoted to the project well-spent. Some 300 IGN specialists and their Saudi counterparts worked on the trailblazing $10-million project in the Rub' al-Khali. Saudi technicians traveled frequently to France for specialist training in topography and other disciplines, many staying on to help analyze the data coming out of the Empty Quarter.

Thomas remembers vividly the highs and lows of those years: the team's astonishment when water bubbled to the surface as technicians sank a geodesic marker 30 meters into the shifting dunes, and the anxiety when a single-engine survey aircraft crash-landed in a blinding dust storm. "We covered thousands of square kilometers," he says, "getting to know this fabulous desert in a way few people ever do.

"'Empty' is a misnomer," he adds: "The Rub' al-Khali contains many hidden riches."

Thomas also points out that Saudi Arabia commissioned such other aerial and satellite surveys as a country-wide road system survey, and is thus particularly well placed to plan and support its domestic development and—by pooling information with neighboring states—cooperate in regional surveys as well.

In 1986, with the Rub' al-Khali project still underway, the assignment to map the Municipality of Riyadh came in. The multi-billion-dollar undertaking was a Saudi-French joint venture, and is still one of the largest and most sophisticated mapping projects ever undertaken. Run by the Saudi Ministry of Municipal Affairs, it took in 1800 square kilometers (695 square miles) of the metropolis itself and a further 1300 square kilometers (502 square miles) of contiguous area. The result was a complete, computerized urban-information system able to give planners a variety of visual "products" in black-and-white or color. Some were thematic—that is, designed for specific uses like highway planning, property demarcation, forest management, water management or agricultural planning; others were cartographic, such as photo-mosaics and digital, relief and conventional maps—all at scales ranging from 1:50,000 (about 1" to 4200') to 1:500 (1" to 42').

IGN International's work in Yemen was also an extensive project. With a population of 14 million, 70 percent of it under the age of 24 and 62 percent illiterate, the country stood only 160th in the United Nations's national wealth rankings—a bleak picture to which the discovery of oil brought the prospect of considerable change. IGN contracted to delineate 37 oil-concession zones for the government.

To do that, a SPOT satellite picked out 236 geodesic reference points—benchmarks—while technicians on the ground set up another 1814 markers and implanted 1869 gravimetric stations to measure the earth's gravitational pull. Thirty IGN technicians, mostly geometricians, plus five Yemeni colleagues and 15 other staff then went to work to match the "ground truth" with remote-sensing data. Their vehicles crisscrossed 3400 kilometers (2100 miles) of road and desert track—sometimes in quite unsettled parts of the country—while a base team set up sophisticated electronic theodolites and laid down six global positioning system receivers. "We knew there were risks, of course," says mission chief Gérard Cosquer, "but after all, isn't it better to lug your theodolite around exciting places than to let it sit unused somewhere in a storeroom in Toulouse?"

The outbreak of war ended a planned $5-million extension of IGN's survey into the south of Yemen, but IGN/SPOT Image has stayed very busy all over the Arabian Gulf and North Africa. Clients are often understandably shy about discussing the objectives of their projects or the use they plan to make of the data, but missions were successfully completed in Bahrain (complete cartographic coverage of the island) and Oman (one government commission, two from the private sector). During this same period, IGN also mapped the whole of southern Morocco using SPOT imagery at a 1:100,000 scale (1" to 1.6 miles), setting up a ground control center and a complete geographic information system (GIS).

IGN International's director, René Thomas, has spent more than a decade on Middle Eastern space imagery projects.

In the late 80's, French specialists analyzed the Djibouti geological fault around the Horn of Africa, analyzing the movement of the African tectonic plates. Working with the World Bank, the French group also carried out cadastral (property-boundary) surveys in Tunisia and Algeria, and set up both a GIS to assist forestry and general agricultural management, and a full cadastral system for Tunisia.

IGN works closely with international bodies such as the World Bank, the Food and Agriculture Organization (FAO), the United Nations Development Project (UNDP) or the European Economic Community. Naturally there's competition with US and Russian satellite data providers, but IGN officials cite a very clear trend toward "joint goals" discussions that will lead to more efficient use of the various satellites' capabilities.

Nations that contribute to international aid and development organizations like the World Bank or UNDP—"especially the United States," notes René Thomas, "see their money commitment backed by crackingly effective, hard, satellite-gathered economic data in support of requests for loans or financial assistance. They know precisely where the money will be used most effectively, and they have easily retrievable and constantly updated real-time computer data at their disposal 365 days a year."

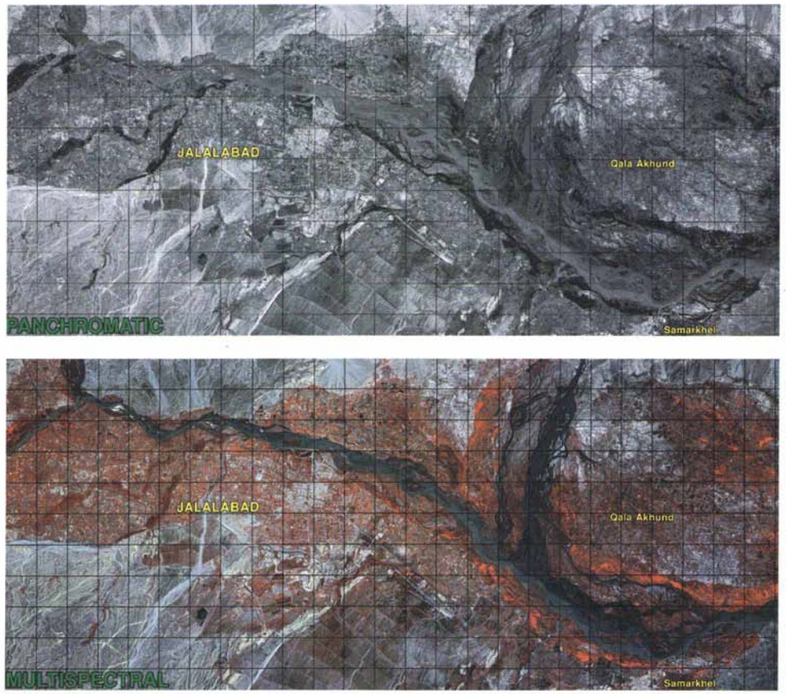
Among SPOT's numerous other non-classified assignments was an ethno-geographic survey of Nubian monuments in cooperation with the United Nations Educational, Scientific and Cultural Organization and the Center for Documentation and Study of Ancient Egypt. The project grew mightily while in progress, yielding a unique cartographic and topographic antiquities inventory not only of the mammoth statues but also of the royal necropolises in Thebes, and taking in even the countless rock faces bearing graffiti scratched by workmen in Pharaonic times!

Meticulously recording the past is a very real contribution to world heritage, but more pressing 21st-century tasks awaited the French technicians in Egypt, where soaring population figures and man-made factors such as the Aswan dam have created new problems.

"Cartography is something like insurance," says one senior IGN official. "You only realize how fantastically useful it is when you actually need it." This was true of Egypt when IGN, in late 1991, mobilized for the first phase of a $27-million job for the Egyptian Ministry of Agriculture and Land Reclamation. The ultimate objective was to help Cairo boost food self-sufficiency; the means were measuring and monitoring existing planted areas; determining how sowing and harvesting of main crops had changed; assessing urban encroachment on arable land; and analyzing the potential for bringing new land areas under cultivation.

Phase one of this undertaking, now completed, involved the monitoring of four million hectares of land (9.9 million acres) in 6240 "reference plots," pro-

TOR EIGELAND



Panchromatic and multi-spectral images of Jalalabad, Afghanistan, and the Kabul River are combined to show both landforms and land use at a resolution of 10 meters, or 33 feet.

duced 25 land-utilization maps (scale 1:100,000) and identified 10 main crops harvested twice yearly, along with a score of related parameters like Nile flow and flood movement.

In addition, Egyptian specialists underwent two years' training in France, where the project was financed, and now constitute a solid, well-trained nucleus of manpower that will be put to use in phase two. Running through 1995, that phase will identify potentially useable desert areas.

Parallel to these efforts is the Nile Delta project, where SPOT-gathered data show not only the significant shrinkage of the Delta over the past 20 years but also the intense demographic pressures that are building up. Both projects—once the data are correlated—serve the ultimate goal of relocating more than a million Egyptians to newly reclaimed desert areas.

Other North African nations with satellite data experience have been watching these developments closely, and none more so than Tunisia, which in December 1993 hosted an international space mapping symposium attended by delegates from 40 countries. The meeting defined goals for international cooperation, notably identification of national requirements in satellite-derived cartography; integration of satellite data into geographic information systems; and measurement of the economic impact of space-gathered imagery—some of which, delegates believe, is likely to overturn long-cherished concepts in land and water management.

One speaker at the symposium cited 78 remote sensing programs—worth $35 billion—that have been completed through 1993, with eight more missions under way and another 45 planned. Arab space specialists lauded France's generosity in transferring space imagery technology, including access to some 3500 kilometers (2175 miles) of new, processed data tape annually, 1300 yearly maps and an awesome 36 gigabytes of stored data.

The Tunis symposium, and planned Arab attendance at the Paris Eurospace summit meeting this year, show that the majority of Arab states are very much aware of the benefits of using space imagery to achieve the most efficient use of all their resources—human, natural and technological—and some are in very good positions to integrate their own data with their neighbors' to potentiate its value.

"In practical terms," says René Thomas, "we are watching a new environmental awareness take shape, with growing influence among decision-makers like the UNDP, the World Bank and FAO. The latter is pushing for a massive satellite resource inventory of sub-Saharan African states that are 'at risk' in terms of development—among them Sudan, once potentially the Arab world's largest food producer [See *Aramco World*, May-June 1978]. The European Community, with its eye on what it calls Euro-Mediterranean co-prosperity, favors a satellite-gathered inventory of the countries on the Mediterranean and the great rivers, among them seven Arab states."

Thomas continues, "Projects like those will heighten awareness. They could be the catalyst for an even bolder plan that I understand has backing in the US and Japan: to mobilize financial resources in support of a giga-project—a global anatomy of our planet, compiled from data gathered by satellites." ⊕

Journalist and author Ian Meadows, who has a longstanding interest in Middle East economic matters, lives in France's Languedoc.

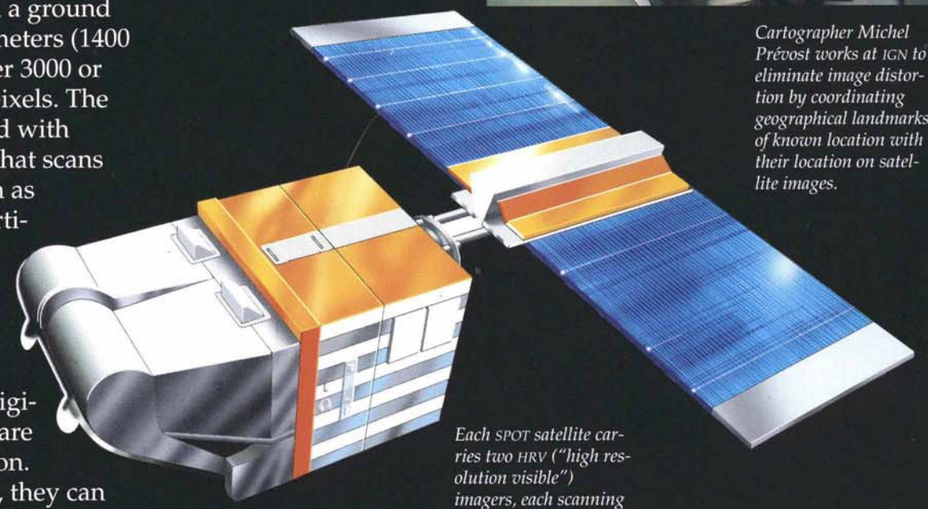
OPPOSITE PHOTO: TOR EIGELAND; OPPOSITE ILLUSTRATIONS: TOM McNEFF

How it Works

Three SPOT satellites now watch the earth. Each is in a circular, approximately north-south orbit 830 kilometers (516 miles) above the earth, and completes 14 orbits every 24 hours. Because the earth turns under the satellite, the ground track of each orbit is 2823 kilometers (1754 miles) west of the previous orbit: If the satellite passes over Charlotte, North Carolina on one orbit, it will pass over Flagstaff, Arizona on the next, or if it passes over Ankara, Turkey at noon one day, it will pass over Valencia, Spain 101 minutes later the same afternoon—and it will pass over Ankara again 26 days later. Each satellite can record images of places as far north as the northern tip of Greenland and, in the south, all but the center of Antarctica. To do this, it uses two camera-like devices that scan a ground area of 60 by 60 kilometers (1400 square miles) in either 3000 or 6000 squares called pixels. The cameras are equipped with steerable mirrors so that scans can be made as much as 27 degrees off the vertical; this makes it possible to produce stereoscopic images if desired. The scans are beamed down to a ground station in digital form, where they are corrected for distortion. Stored in a computer, they can be retrieved and processed at space imagery rectification centers into a wide variety of maps and images.

Each SPOT satellite circles the globe in polar orbit every 101 minutes as the earth turns beneath it, scanning a more westerly band of terrain with each pass. The orbit is synchronized with the sun, so the lighting of each image is identical.

Cartographer Michel Prévost works at IGN to eliminate image distortion by coordinating geographical landmarks of known location with their location on satellite images.



Each SPOT satellite carries two HRV ("high resolution visible") imagers, each scanning a 60- to 80-kilometer-wide swathe of the earth with either 3000 or 6000 detectors that measure reflected sunlight.

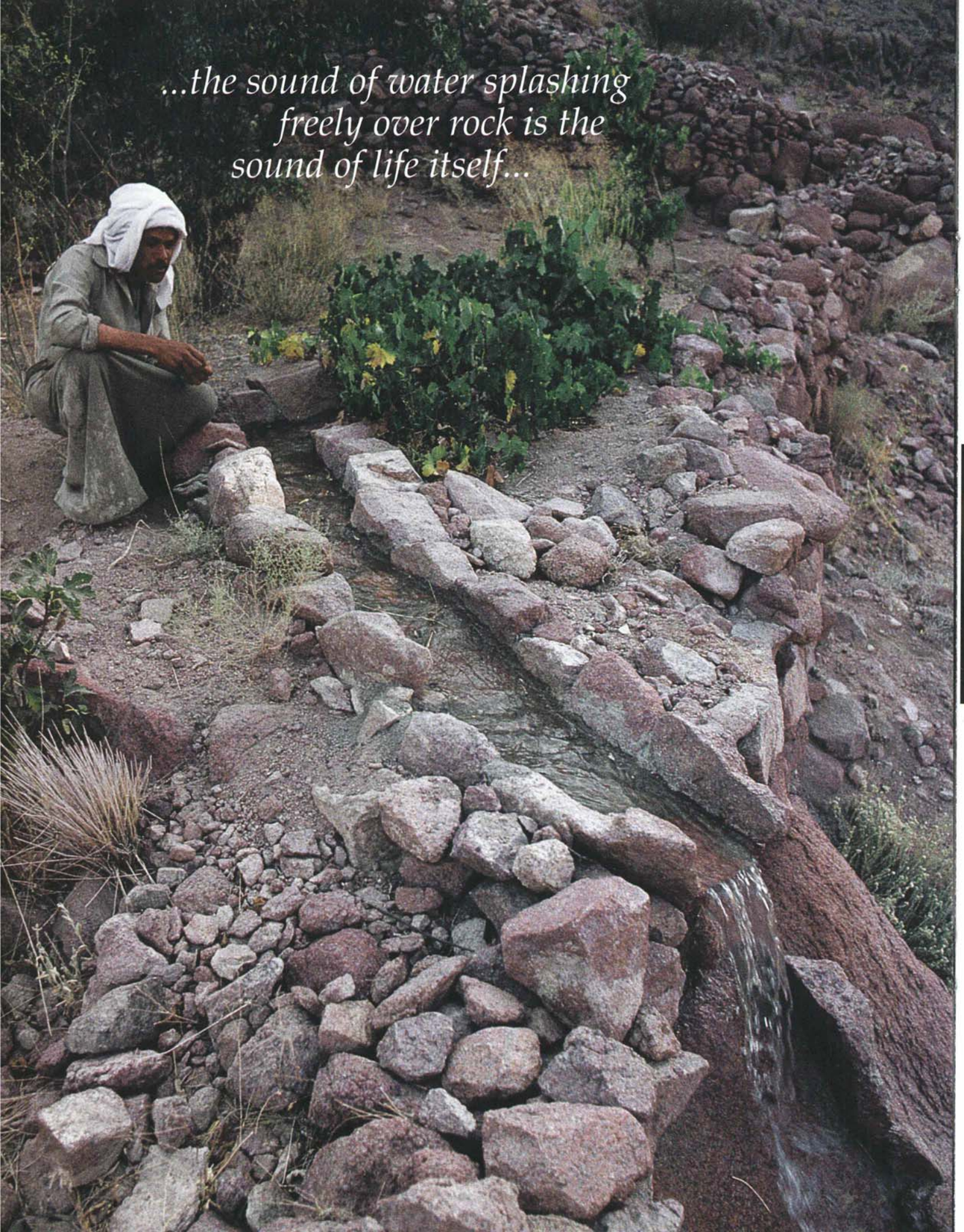
Oases in the Rock:

The Gardens of the High Sinai

Written and photographed by Dick Doughty

He hadn't done it yesterday, so now it was time for Saleh Awad to water his garden.

We wound down the short, soft dirt trail. Grape vines, almond trees, apple trees and even young plum trees all crowded the path as if in greeting, or to offer their abundance for breakfast on this hot summer morning. Above them and beyond the shoulder-high rock wall nearby, red granite stretched up, barren and rough,



into high, wind-sculpted peaks that formed jumbled ridges on both sides of this narrow valley. Awad cinched his headscarf down to better shade his sunken, 61-year-old eyes. He fixed his cigarette to the edge of his lips, bent down, and yanked out the plug on his spring-fed, stone water cistern.

Among the 1500 Jabaliyyah Bedouins who live in these central Sinai mountains, the sound of water splashing freely over rock is the sound of life itself, as reassuring as the crackle of a campfire or the pat-pat-pat of bread dough being shaped by practiced hands. As Awad lifted a rock here and shoveled a bit of earth over there, he watched the flow intently, letting pass just so much water and no more into each branch of his network of contoured channels. First to the string beans, then to the corn the water flowed, then to the cucumbers and to the tomatoes—some so big you couldn't hold two in one hand—and finally to the fruit and nut trees: the figs, the pears, the almonds and the walnuts. From this summer's harvest until next, his family will live mostly on what he waters today.

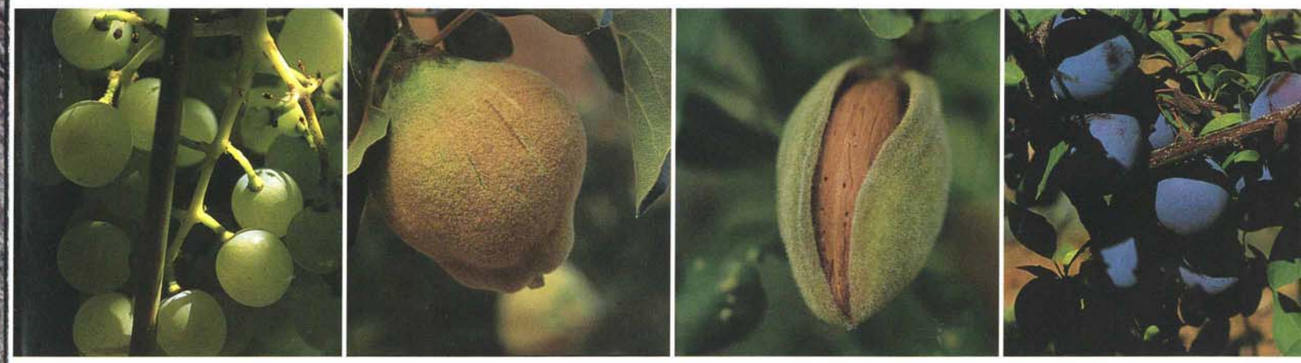
Awad's garden lies at just above 1550 meters (5085 feet) altitude in Wadi Abu Tuwayta, a day's walk, over two high passes, from the town of St. Catherine if you set out with the famous Jabal Musa—Mount Sinai—over your left shoulder. Along the way, in every narrow rock valley, or wadi, gardens appear suspended below the giant walls of cracked, sun-blasted rock like living green islands.

In Wadi Zawatin, a few kilometers from Wadi Abu Tuwayta, 81-year-old Muhammad Zaytan sat cross-legged as he hacked slowly at the earth with his pick. He was, he said, leveling the ground to enlarge one of his gardens. "Now it takes me four days to do what I used to do in one," he said, but he was as quick with his grin as he was dogged with his pick. Every few minutes he rose and lugged watermelon-sized rocks over to the pile that would later form the garden's new wall. His remodeling marked the latest improvement among the more than 300 Jabaliyyah gardens.

Though a few gardens are only years or decades old, most have been tended, ignored, revived and reworked over centuries. Many have fed people for longer than anyone can remember. Mahmoud Mansour, a Jabaliyyah guide well-versed in the region's history, pointed out one garden wall built of stones far larger and smoother than any others. He explained that it was believed to be more than 2000 years old—possibly of Nabatean origin—because the wall is not like the ones built even by the sixth-century Byzantines, the first group to cultivate these valleys on a large scale. "I don't know who built it, but whoever did, they were tough," he commented.

It was in the early fourth century that Byzantine monks first came to live on the plain at the base of Mount Sinai. Two hundred years later, soldiers dispatched by the Roman emperor Justinian arrived to oversee construction of what would become the Monastery of St. Catherine. As laborers, the soldiers brought several hundred serfs from northern Egypt and what are now Romania, Bulgaria and Serbia. In time, the monks alone numbered more than 3000, and many of the laborers were freed. Both monks and freed laborers supported themselves by building gardens in the mountains, where springs were as plentiful then as they are today.

As people of the Mediterranean, the Byzantine monks introduced olives, almonds, walnuts, grapes,



Above: A sampler from the Jabaliyyah summer harvest: grapes, quince, almond, plums.

Left: On soil cultivated since Byzantine times, Mahmoud Mansour spills water into a lower terrace.

Previous spread: Climbing into Jabaliyyah territory past a walled garden, the path ascends what the Jabaliyyah Bedouins themselves jokingly call Wadi Abu Jifa, or "the valley of stink," because the well-worn trail is heavily used by camels.

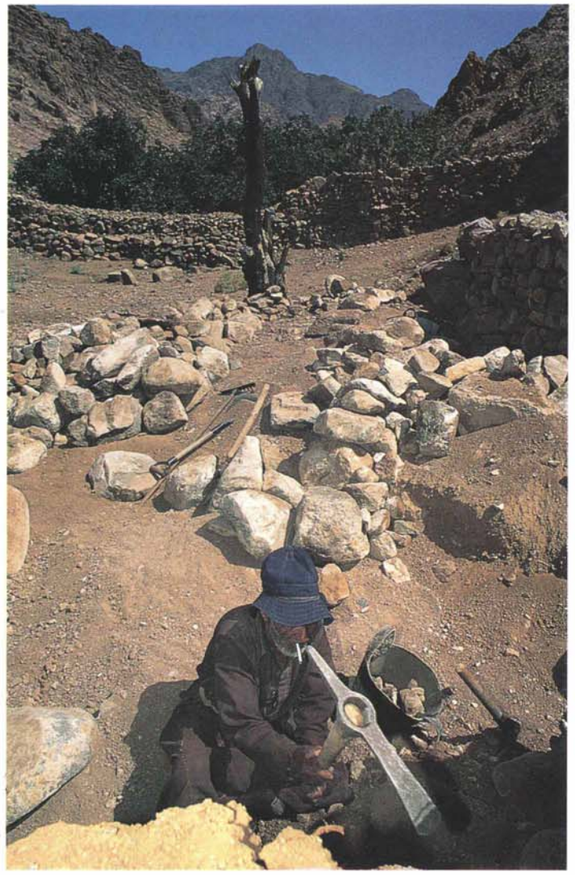
figs and pears, all of which the Jabaliyyah now depend on and cultivate with great skill, said Joseph Hobbs, associate professor of geography at the University of Missouri and now an adviser to the Egyptian Environmental Affairs Agency (See *Aramco World*, March-April 1991). "You can't really appreciate the roots of Jabaliyyah agriculture without understanding their relationship with the monastery," he said.

In the seventh century, when the Muslims brought Islam to Sinai from Arabia, many of the monks abandoned their gardens and the monastery. However, descendants of the laborers remained and intermarried with the far more numerous new arrivals.

Now the Jabaliyyah tribe spends each year as it has since the 700's, keeping warm during the cold and often snowy winters in stone houses in the town of St. Catherine, and living from late spring to late fall in mountain houses adjoining their high gardens. Called "vertical nomadism" by anthropologists, this lifestyle sets the Jabaliyyah apart from other Bedouins, most of whom live by guiding herds of livestock from one desert pasture to another according to the pattern of rains.

"People think Bedouins hate agriculture," said Hobbs. "But the Jabaliyyah see farming as one more means—and a very satisfying means—of making a living in a challenging environment."

Though the Jabaliyyah also support themselves with goat and sheep herding, tourist guiding and wage labor, it is the gardens that provide both their psychological and their economic center. At night, when stars light the sky with piercing intensity and people pay visits to each other by firelight, the cloudy strip of celestial luminescence known to Westerners as the Milky Way appears to the Jabaliyyah as the Line of Fruit. In winter, it sinks low in the sky; in summer, at harvest time, it shines directly overhead, as if to bless by night what the sun has nourished by day.



To enlarge his family garden, Muhammad Zaytan digs away at the mountainside the way it has always been done.

Awad and his family, like all Jabaliyyah, eat what they grow. A part of his almond crop and an occasional armload of fruit to a passing group of foreign trekkers is all that he ever sells. Many gardens are owned collectively within large families, some of whom keep numerous gardens in the same wadi. To judge by the almost complete lack of migration of young Jabaliyyah to the cities of Egypt, their life, like the land itself, is demanding, abundant and ultimately satisfactory.

The way the Jabaliyyah cultivate their gardens reflects their centuries of adaptation to the demands of land and weather. The rock walls not only mark the borders of a garden—into which it is strictly forbidden to enter without the owner's permission—but also help prevent soil erosion during winter rains.

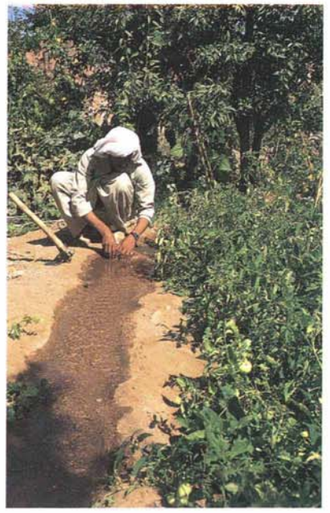
...it is the gardens that provide the Jabaliyyah their psychological and economic center.

Even though rainfall totals only four to five inches a year, Mansour said, the mountain slopes absorb almost none of it and thus act as stone funnels, often turning the wadis into small rivers. The rock walls divert the strongest flows around the gardens.

Inside the walls, the Jabaliyyah often employ grafting to help their fruit trees adapt to the desert climate. According to Awad, it is an ongoing art of trial and error. He said he likes the experimentation. "Sometimes it works and sometimes it doesn't," he said. "The roots of the two trees must be similar. I talk to other men about it and they talk to me, so we help each other."

The most successful traditional grafts use the drought-resistant, spiny *zaruur* bush *(Cartaegus sinaica)*, one of the 24 local plant species that grow nowhere in the world but in these mountains. Onto the *zaruur*, which by itself produces only a small, inedible fruit, the Jabaliyyah have long grafted Nile valley figs, "American" apples and several varieties of pears. They first carve a deep notch into the trunk of a mature *zaruur* bush, and then tightly tie a perfectly fitted branch of the fruit tree into the notch. The grafted branch grows amid the tangled and healthy branches of its *zaruur* host and, after several years, produces fruit, apparently as a fully desert-adapted tree.

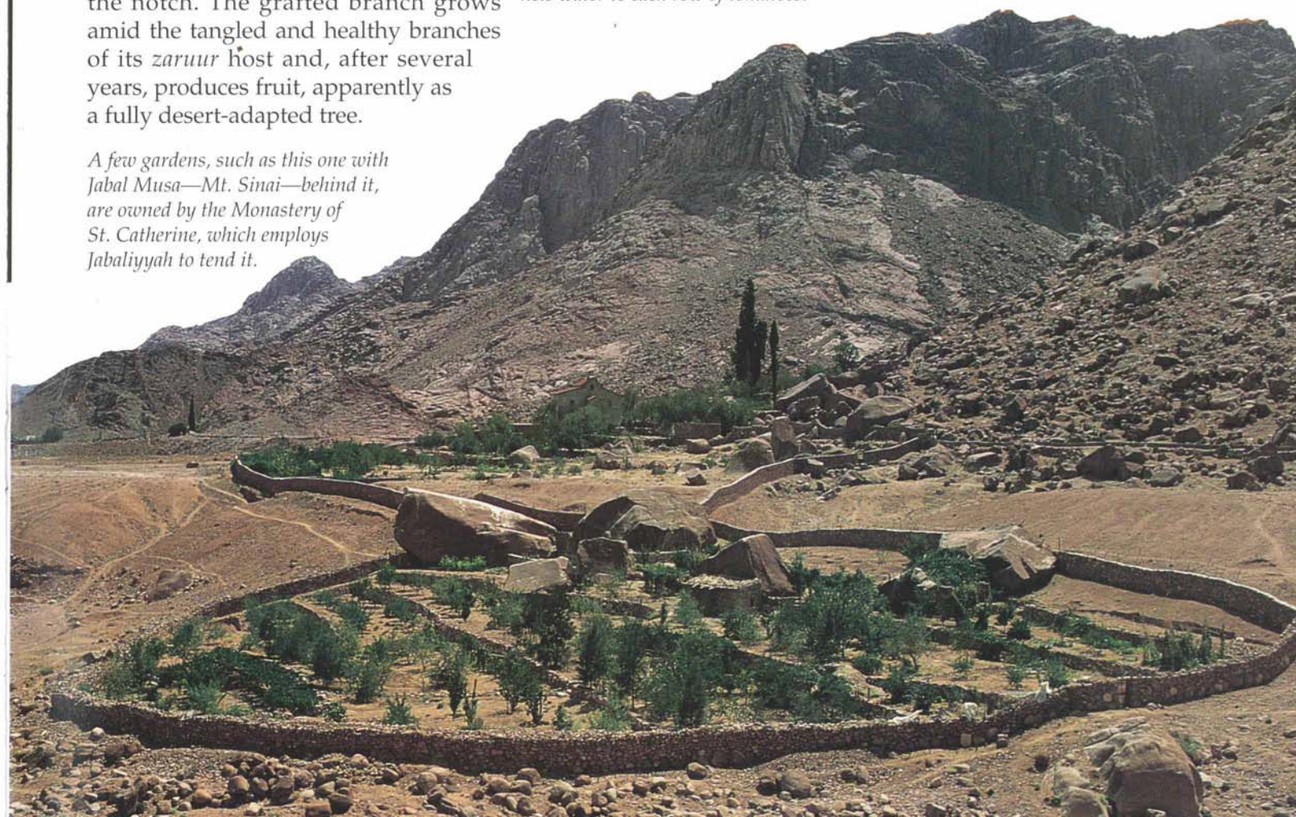
A few gardens, such as this one with Jabal Musa—Mt. Sinai—behind it, are owned by the Monastery of St. Catherine, which employs Jabaliyyah to tend it.



In his uncle's garden, Mansour channels water to each row of tomatoes.

The availability of water and soil have always dictated the placement of the gardens. Some, like Awad's, are fed by both a spring and a well. Other gardens may have more than one of either source. Soil, created over the centuries by winter rains washing down the mountains, has accumulated most abundantly in the wadis where the slope is gentle. Through careful terracing, however, a few gardens take advantage of less common soil deposits on steep terrain.

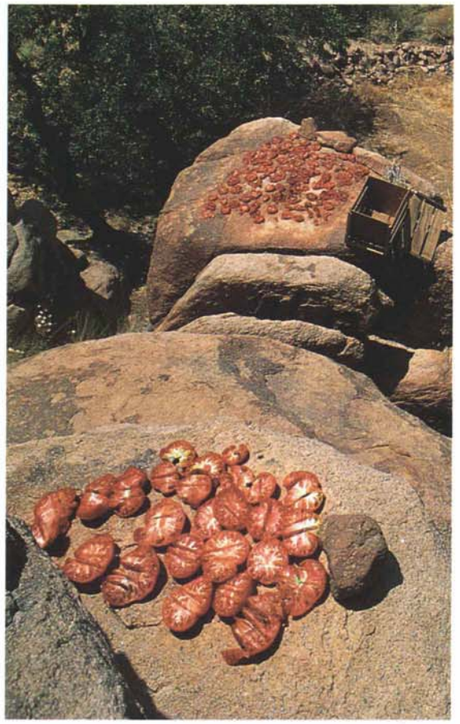
When the Jabaliyyah dig a well, they are successful more often than not. The surest way to find water, Mansour said, is to search out a dark vertical stripe in the granite of a mountainside. Geologically known as dikes, these stripes are "like pipes," he said, because they are porous, whereas the red granite is impermeable to water. Thus digging where a dike disappears down into the *wadi* floor often yields a good well. But there are other ways to



find water, too: Three years ago Mansour himself discovered traces of a Byzantine garden wall on a slope not far above his own garden, and figured that the ancient gardener must have drawn water from somewhere. After carefully examining the land, he unearthed a serviceable well "in exactly the place where they would have had to make it," he said.

No one has ever challenged the Jabaliyyah's rights to their garden land. To nearly all outsiders, their environment appears precarious, harsh and unenviable. Only one other Bedouin tribe, the Awlad Sa'id, lives about 15 kilometers (10 miles) away, and the Jabaliyyah say relations are good.

In the town of St. Catherine, Jabaliyyah children have attended Egyptian government schools since 1982. Mansour recalled with a grin the teacher from Cairo who complained to him that the children seemed to be more interested in goats and plants than in the textbooks. Later in life, young Jabaliyyah men put in a mandatory year with the Egyptian army. In 1985, the government began to register the Jabaliyyah garden plots. At first most Jabaliyyah found this irritating, Mansour said, but now see it as legal protection against unforeseen future problems. In May, Jabaliyyah lands will become part of the 5000-square-kilometer (1930-square-mile) St. Catherine Natural Protectorate, slated in time to become a full-fledged national park. The internal affairs of the protected area will be managed largely by the Jabaliyyah themselves.



After drying for two days in the sun, these tomatoes will become winter food stocks.

Right: When garden work takes men up to a day's walk from home, many sleep beneath the starry belt known in the West as the Milky Way, but here called The Line of Fruit.

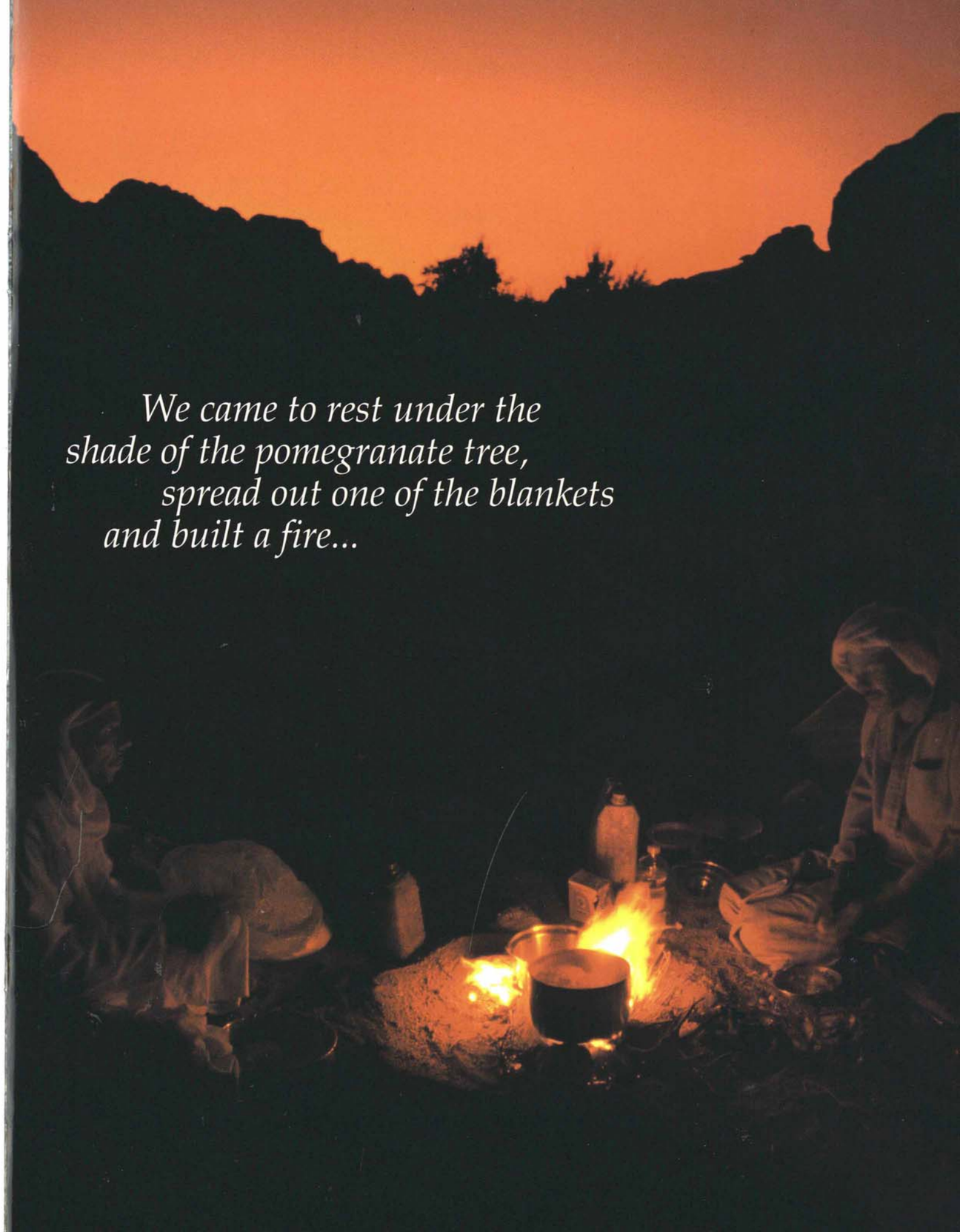
The protected status will allow the Jabaliyyah tighter control over visitors to the high gardens, who nearly always arrive as tourists. Shaykh Muhammad Abu Haym, leader of the Jabaliyyah for more than 30 years, said that on some days in summer, more than 100 tourists hike out from St. Catherine on Jabaliyyah-led treks. Although litter is a growing nuisance along the trails the Jabaliyyah maintain among the high valleys, and the supplies of mountain firewood are becoming depleted, tourism means income for the tribe, he said. His small crowds, he added, are far easier to cope with than the tens of thousands who annually tour the nearby Monastery of St. Catherine and trudge up the time-worn steps of Jabal Musa.

The Jabaliyyah minimize the trekkers' impact by requiring visitors to employ Jabaliyyah guides. "The guide keeps them from getting hurt or lost," says Awad. "If they sneak up the mountains [without a guide], the people here catch them. I would report them to the tourist police." Guides also serve the trekkers by helping them to understand Jabaliyyah life and by admitting the visitors into family gardens and sharing a bit of the harvests.

Inside Mansour's own garden, on a steep slope in Wadi Itla'ah just about three hours' walk above St. Catherine, he keeps for visitors three blankets, two teapots, a few cups, a few bowls and a few utensils in a battered trunk under the ledge of a large boulder. His is sort of a recycled garden, he explained, one that lay ignored for hundreds of years until he revived it and called it his own five years ago. We walked slowly from one painstakingly leveled terrace to the next as he pointed out the figs, apples, pears, pomegranates and, on the highest terrace, the spring that nourishes it all. We came to rest under the shade of a pomegranate tree, spread out one of the blankets and built a fire for tea.

Not for the first time, I spoke of how impressed I was by the workmanship in this and so many other gardens. He smiled and shrugged lightly. Mostly he enjoyed it, he said. Some days he and his wife work there together while their young son plays among the rocks and trees. Sometimes the work gets difficult, especially in years when the winter rains are slight. But, he added, "if you don't get tired, you don't feel life."

Dick Doughty, assistant editor of Aramco World, *is co-author of* Gaza: Legacy of Occupation—A Photographer's Journey, *to be published in 1995 by Kumarian Press.*



THE ARABS OF HAVANA

Guarding Havana's harbor is "El Morro," the Spanish-era fortress whose name refers to Arabs of Spanish origin, admired in Cuba for their initiative and strength. Below, the Union Arabe de Cuba, or UAC, counts 3000 members.

Written by Bill Strubbe and Karen Wald
Photographed by Bill Strubbe

Havana is best in the morning, as it first stumbles into gear. A woman in white stands at the edge of the sea, roosters crow from laundry-laced balconies, crammed buses jostle over pot-holed streets, and a symphony of bicycle bells resounds from faded pastel walls that smolder golden in the early light.

Along the tree-lined Prado, where American-made cars from the 1950's nose to the curb and uniformed children make their way to school, there appears a blue building with a simple neon sign that reads "Union Arabe de Cuba" in Spanish and Arabic. The UAC, as it is called, is the focal point of social and cultural life for Havana's thousands of Cuban Arabs.

Inside, historian Euridice Charon explained that, because most Cuban Arabs are third- or fourth-generation descendants of immigrants, counting them is an imprecise art; the best estimates top 20,000 people. However, the Arab and Muslim presence in the Caribbean (See *Aramco World*, November-December 1987) and in Cuba can be traced much further than a few generations. As Christopher Columbus voyaged across the Atlantic in 1492, the last stronghold of the Andalusian Muslims in Spain fell to Christians in Granada (See *Aramco World*, January-February 1993).

In subsequent years, the Spanish crown enacted progressively harsher laws restricting Muslim religious freedom and customs. Many sought haven elsewhere, from North Africa to the New World. But the conversion to Christianity of the native peoples was an important justification of the Spanish conquest of the New World, and the crown thus forbade non-Christians from boarding transatlantic ships.

The sheer number of laws, some threatening the death penalty, that forbade passage to the New World—not only to Muslims but also to Gypsies, Jews and Protestants—is evidence that many members of those groups did in fact slip through (See *Aramco World*, May-June 1992). Among the Muslims who succeeded are Beatriz la Morisca—whose surname means "Moor," or a Muslim of Spanish origin—and Isabel Rodriguez, both of whom aided Francisco Pizarro in the conquest of Peru. Later in Peru, Captain Giorgio Zapata, after amassing a fortune in the silver mines, sailed home not to Spain but to Istanbul: His real name was Amir Cighala. Also in Lima, in the 16th and early 17th centuries, several people were brought before the Inquisition on charges of being secret Muslims.

The travel restrictions against Muslims lasted nearly 400 years, until 1900—roughly 20 years after many Arabs began arriving from Lebanon, explained Charon. "But dur-

The Arab immigrants identified with the Cuban character and Cuba's struggles for independence. That made it easier for them to assimilate.

ing those centuries the Spaniards overlooked another source of Muslim infiltration—the Muslim West Africans who arrived in the holds of the slave ships."

"Ever since my student days, I thought that Arab history was important in Cuba, but it was not very well known or well explained," said Charon, who credits her father with kindling her interest in Arab culture by sending postcards while he worked as a doctor in Algeria. Later, she received a five-year scholarship to study Arab history in the Soviet Union. In 1990 she began research on Arab immigration into Cuba, scouring immigration, baptismal and wedding documents, as well as trying to trace Cuban family names of Arabic origin, such as Chediak, Trabranes, Bauek, Rachid, Bez and Rassi.

Of these names, the Rassi clan is today one of the largest, with more than 80 family members spanning four generations. Among them, the older folks still greet each other in Arabic and enjoy Arab cooking, making kibbe, cabbage rolls and shishkebab.

"Food is a culture's most enduring custom," said 54-year-old Reynold Rassi Suarez, editor-in-chief of correspondence at *Granma*, the newspaper of the Cuban Communist party. He delicately explained that, although the Arab Union offers an Arab cooking class once a month, the current international political and economic situations limit availability of the necessary ingredients.

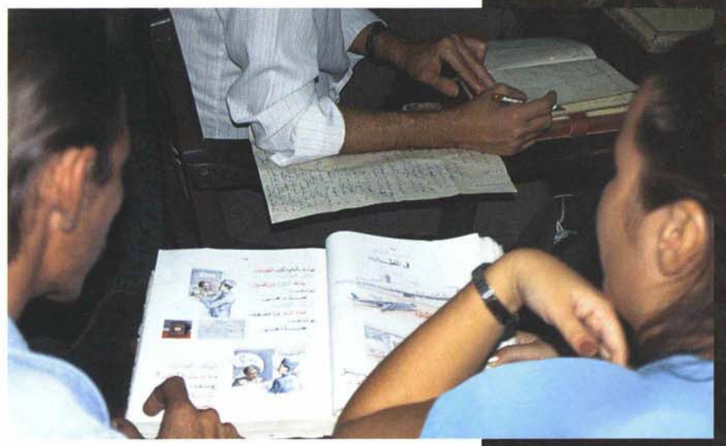
Suarez's grandparents left northern Lebanon at the turn of the century, and both his parents were born in Cuba's Matanzas Province. The family moved to Havana in the 1930's. "My grandfather was proud to be Arab and he spoke both Spanish and Arabic, but my grandmother knew only Arabic, so we spoke that with her at home," he recalled. "My grandmother liked to go out a lot, but because of the language problem, it wasn't easy for her. Sometimes she would sneak out of the house and get lost, but everyone in the barrio knew her and someone would always bring her back home."

Arabs in Cuba were often nicknamed "Morro," but Suarez contends that, while in Europe the word was an epithet, close to a racial slur, in Cuba it connoted someone who took initiative and was strong—maybe even a warrior: The formidable old fortress guarding Havana's harbor is called "El Morro." "The Arab immigrants identified with the Cuban character, Cuban idiosyncracies, and Cuba's struggles for independence," he said, "and that made it easier for them to assimilate."

Cuban history counts several Arabs among its heroes. In the last century, Commandant Elias Tuma, from Bicharre, Lebanon, fought in the War of Independence against Spain. In the 1930's and 1940's, Arabs were active in the struggles against the Machado and Batista dictatorships, and some were among the famous guerilla forces in the Sierra Maestra Mountains. After the 1959 revolution, Alfredo Yabur became Minister of Justice; Levi Farah became the Minster of Construction; and today, Dr. Gustave Kouri directs the Tropical Medicine Institute named after his father, Dr. Pedro Kouri. Fayad Jamis, born in 1930 and known as "the poet of Playa Giron," is one of Cuba's greatest poets. Nola Sahig, who died in 1988, was a brilliant scholar of Arab music and culture, an accomplished pianist and a founder of numerous Cuban-Arab organizations.

During an informal flamenco class at the UAC, a generation descended largely from 19th-century Lebanese immigrants keeps alive a tradition that has roots in Andalusia.

In the UAC library, young Cuban Arab artists prepare for an exhibition.



Arabic-language classes at the UAC are often attended by non-Arab Cubans.

In Havana, Arabs settled mainly in Barrio Monte, where many established textile, clothing and watch and jewelry businesses along Monte Street. But the abolition of private enterprise after the 1959 revolution fragmented the trade-oriented Arab community. Many left for the United States, others departed for Mexico and South America, and little was left behind to distinguish the Arab barrio.

Gradually, the Union Arabe de Cuba became the repository of post-revolutionary identity among the remaining Cuban Arabs. The first Syrian, Palestinian, and Lebanese societies were formed in Havana in 1918, 1919, and 1920 respectively, with auxiliary chapters in other cities. Lacking their own organizations, immigrants from Yemen, Algeria, Tunisia and even Turkey also joined those groups. In 1938, the first united Arab association was established, but it folded in 1971. It was not until eight years later that the UAC reopened, with assistance from Arab embassies.

"The former [Arab] unions were based on nationality and religion. We wanted the new union to be based on diversity," explained Alfredo Deriche Gutierrez, now president of the UAC. "In 1979 there were a lot of difficulties in the Middle East, and we achieved here in Cuba what has not been achieved there. It wasn't easy, and there were many misunderstandings, but eventually we were able to bring about enough enlightenment."

The UAC's library, salon, restaurant and meeting hall create a focus for cultural activities and provide something like a home and family life for Arab students from overseas studying in Cuba. The UAC hosts receptions for visiting Arab dignitaries, offers a Saturday-morning lecture series on Middle Eastern culture or politics, and publishes a magazine, *El Arabe*, which covers events in the Middle East as well as local activities.

The UAC also sponsors Arabic language classes. The advanced class's teacher, Gisela Odio Zamora, was among the first Cubans to study Arabic abroad: She lived in Syria from 1974 to 1979. She is president of the Arabic Speakers of Cuba social group, and also translates for Cuban enterprises doing business in the Arab world. Most of her students at the UAC are Cubans not of Arab descent, she said: There are several women engaged

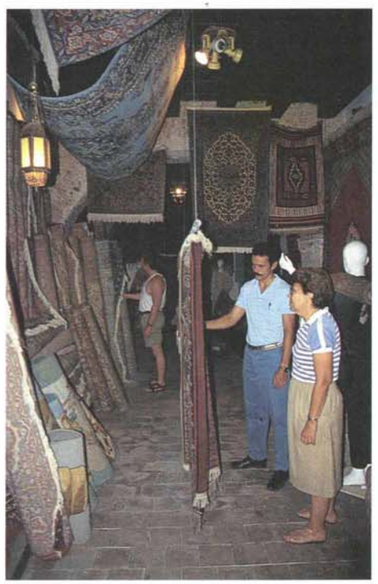
We wanted the new union to be based on diversity, not nationality or religion. It wasn't easy, but eventually we were able to bring it about.

to men from North Africa, a Middle East history student, a doctor who served two years in Libya and wants to return someday, and a man of Lebanese descent who goes home from class and teaches everything he learns to his young son.

A short walk east from the Arab Union, the streets of Old Havana are lined with aging architectural treasures; some of them have conspicuously Moorish detailing. In this quarter stands the Arab Cultural Museum, open since 1983. While the building is in a typical Spanish Colonial style dating from the late 1600's, it contains design elements that are legacies of Muslim Spain centuries earlier: Open verandas surround a two-story central courtyard, in the middle of which stands a cistern to collect rainwater from the tiled roof.

The streets of Old Havana are lined with aging architectural treasures; some of them have conspicuously Moorish detailing.

This 19th-century barqueño, *or writing chest, with mother-of-pearl inlays, now in the Arab Cultural Museum, was crafted in Granada.*



One hall of the museum is devoted to carpets donated by Arab diplomats.

Inside, the furniture displays show Andalusian influence, too. One tall cabinet is modeled after a building in the Alhambra, the 13th-century citadel and palace of the ruling Umayyads in Granada (See *Aramco World*, September-October 1992). Lavishly inlaid with bone, ivory and shell are three 19th-century *barqueños*, or chests that open into writing desks, also from Granada. One, constructed of a multitude of precious woods, bronze, copper and pigmented paste, is inlaid with Arabic script, executed in mother-of-pearl, that reads "There is no god but God."

Displays from the Western Sahara include a camel-hair *burnous*, or cape, from Algeria, Berber ceramics, and a collection of carpets largely donated by Arab delegations and embassies.

"We'd like to improve the museum with money raised by the admission fees and the Arab restaurant upstairs," explained museum guide Rigoberto Menendez. Air conditioning, he added, would help regulate temperature and humidity to better preserve the exhibits.

Outside, the grape arbor dapples a tapestry of light and shadow across the courtyard to the entrance to one of the city's two mosques. The other one, Menendez pointed out, is being renovated, and "should be ready soon."

Although most Arab immigrants to Cuba in the last century have been Christians, a significant minority have been Muslim. Both church and mosque watched their congregations dwindle as the 1959 revolution brought dialectical materialism to Cuba, but in recent years there has been a gradual but widespread return to spiritual roots. As a result, an increasing number of Cuban converts to Islam now attend Friday prayers at the mosque, alongside Arab diplomats and students from abroad.

In the shade of a grape arbor, a worshiper performs his ablutions before entering the city's only functioning mosque.

Yahya Pedron, a 38-year-old, non-Arab Cuban, said that he "found the Qur'an on the street." He laughed and explained, "No, really, when I was about 20 years old, I was walking down the street and I found a book *about* the Qur'an. I read it, and after that, the Qur'an became my guide." Born in Pinar del Rio, Yahya works as a mechanic in a power plant. "I always believed in God and had general religious beliefs, but each person has his own way to worship, and Islam suited my needs."

He and other Muslim friends and families now observe Islamic rituals such as fasting during the month of Ramadan, and celebrate the *'Id al-Adha*, or Feast of the Sacrifice, that links Muslims around the world. They often study the Qur'an and pray together. Pedron estimated the Muslim Cuban population in Havana at about 100.

Others in the mosque had experimented earlier with a variety of faiths. "I had a lot of misconceptions about Islam, as information is not well disseminated in this part of the world," explained a 52-year-old man who asked to be called Hasan. He converted after reading *The Autobiography of Malcolm X*. "I saw how corrupt his life had been and how adopting Islam changed him. In Makkah, Malcolm saw that there was no difference between men, that—slave or king—all were the same before God."

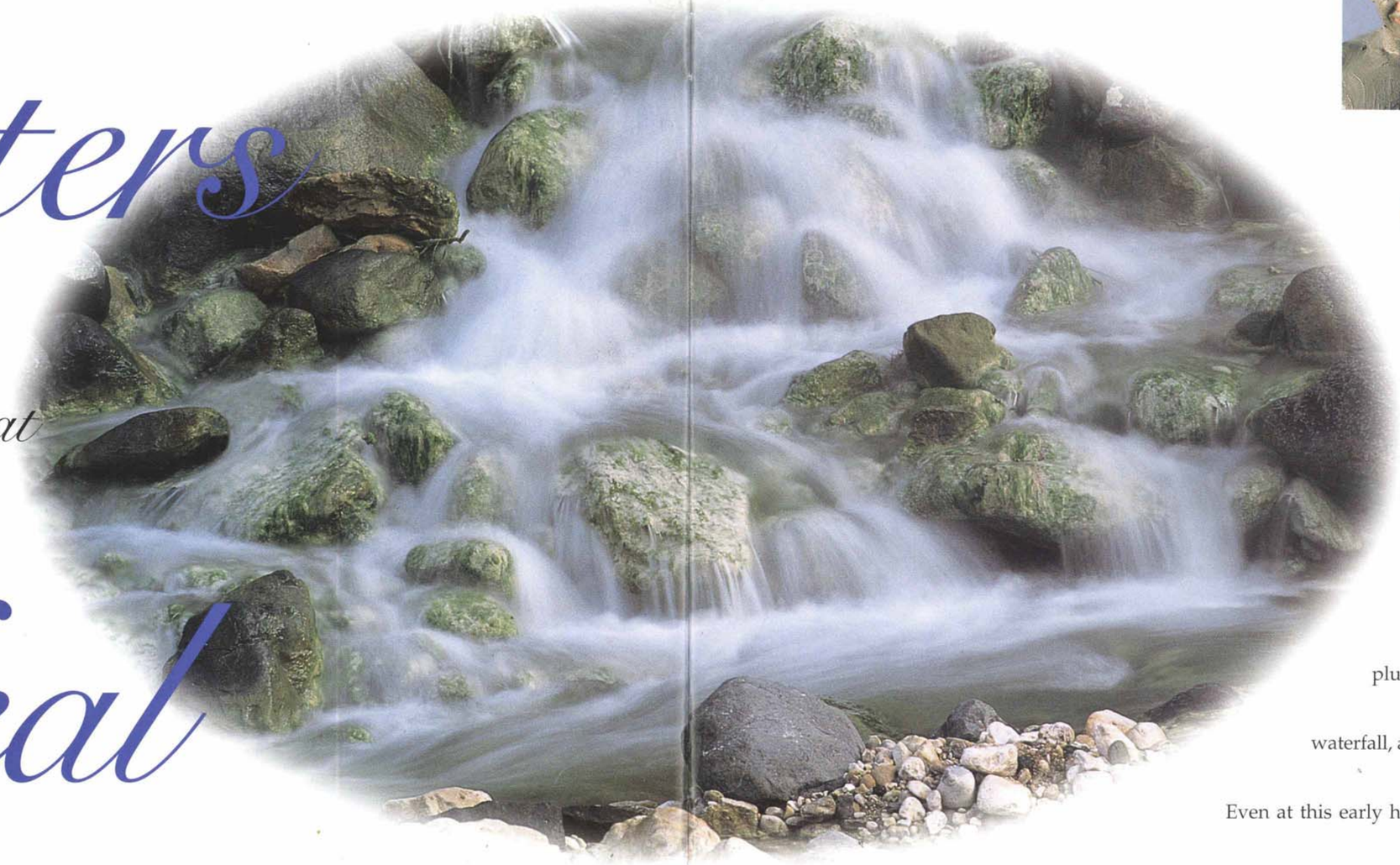
The youngest of the group in the mosque, when asked his Spanish name, replied, "My name is Ibrahim. I no longer use my Spanish name." Several years ago, he said, a Muslim befriended him, and Ibrahim was influenced by their conversations. "At first my family thought [my conversion] was strange. My friends even thought it was a bit laughable, but now they see it is something good."

Outside the mosque, the men of Havana's small Muslim community have taken it upon themselves to visit and help families in need. "I now think about how I can serve people and always give a part of what I have to the poor," one said. "I used to drink, I was dishonest in business, and didn't care about my neighbor. Now I am more tolerant, and respect nature. For me and others like myself, we have grown as men." ⊕

In recent years there has been a gradual return to spiritual roots. An increasing number of Cuban converts now attend Friday prayers at the mosque.

Boston-based free-lance writer Bill Strubbe specializes in international cultural issues. Karen Wald is a US journalist who has lived in Havana for 25 years.

The Waters That Heal



Rising from the earth with volcanic warmth to tumble down rocky Wadi Ma'in, the famous natural springs of Ma'in, among Jordan's nearly 200 hot springs, produce both soothing waters and a salve-like mud (right), a favorite cosmetic of spa visitors.

Written by Kirk Albrecht
Photographed by Bill Lyons

Sunlight splashes over the rim of the wadi, burnishing the hills and accenting the red sandstone walls that tower on either side. Ferns, reeds and a few trees dot the rock with green. In the cool of the desert morning, a plume of steam rises off the *shallal*, the waterfall, as it tumbles to the river below.

Even at this early hour, families who have slept on the hard ground are already bathing, singly or in small groups, amid the rock perches and pools of the naturally hot mineral waters of Ma'in, in Jordan. Generations of their ancestors have done the same.

Ma'in is rugged and spectacular and—though only 60 kilometers (37 miles) south and west of Amman—lies well off the beaten path. Nestled in the bottom of a wadi, or valley, the hot springs attract not only casual bathers. They are also the center of the Ma'in Spa Village, specializing in the treatment of arthritis, joint pain and circulatory diseases.

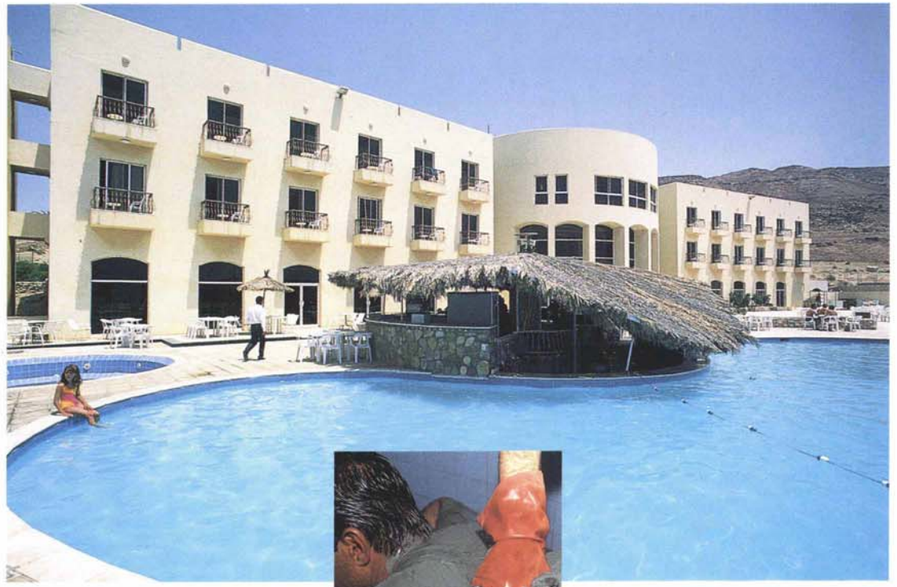
Built in 1989 and operated by a private corporation under government supervision, the complex contains a hotel, tourist chalets, restaurants, two swimming pools, a fitness room, and even a market. A similar spa village at the Dead Sea Hotel, soon to be directly linked with Ma'in by a mountain road, specializes in the treatment of skin diseases.

The springs at Ma'in have been known at least since Hellenic times.

Weary bodies have sought curative waters to ease their ailments for thousands of years. There is archeological evidence of Neolithic and Bronze Age devotions at hot springs in France, Italy, and Switzerland. The founding of Bath, England, is attributed to Bladud, the father of King Lear, who in 863 BC was cured of a "raging disease" by immersion in the steamy swamps near the present-day city. The ancient Greeks erected temples to Asclepius, god of medicine and healing, near natural springs, and a Roman cult, aimed at relief of a plague around 293 BC, grew up around such springs. The springs at Ma'in have been known at least since Hellenic times, and the Roman-era historian Josephus recorded them as Therma Callirhoes, or "beautiful thermal waters."

Centuries later, motivated by the belief that God provides help in nature for human afflictions, Muslim physicians and naturalists were quick to explore the curative powers of hot springs. Muslim baths fused eastern traditions with what was by then a largely Roman technology, and the result has been a fixture in Middle Eastern cities for centuries.

Combining the ancient with the contemporary, the staff at the Ma'in spa prescribes an individual treatment regimen for each patient only after screening him or her for high blood pressure or heart difficulties that could be aggravated by the hot waters. There are several types of whirlpool baths, a hot-water pool, massage treatments, and hot-mud therapy. The spa is divided



With a medically supervised regimen of hot mud (inset, above), hot baths and desert sun, both the Dead Sea Spa Hotel (above) and the Ma'in Spa Village (opposite) combine holidays with therapy to offer "medical tourism" for both local and international clients.

into men's and women's sections, each with the same up-to-date facilities, and each patient's program is overseen by a physiotherapist.

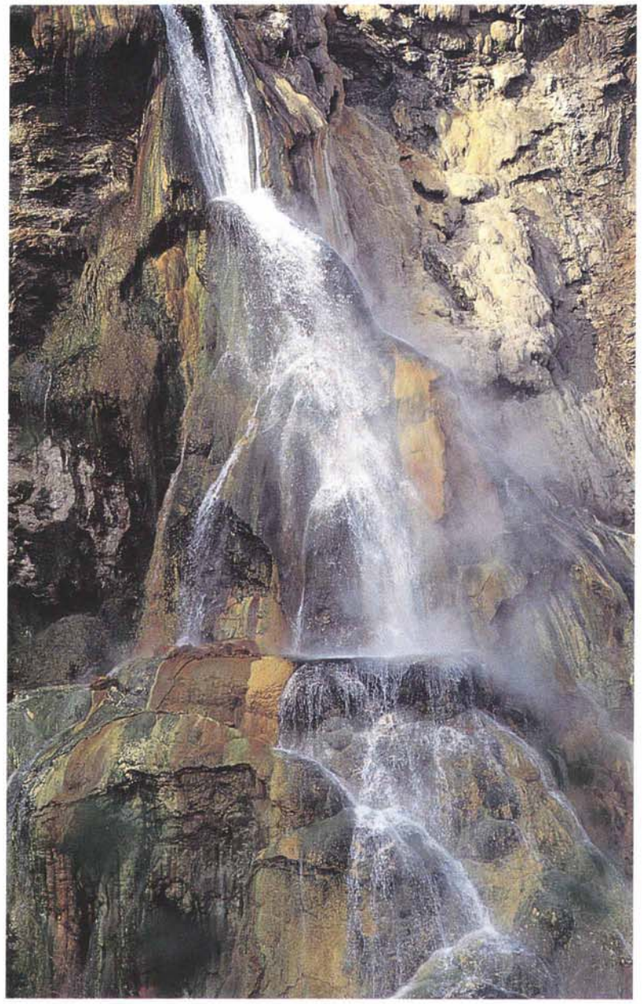
During my own visit, I ask to sample the treatments. When I deny any health problems, the doctor consents, and allows me to pick and choose my treatments. After a cold shower to prepare me—and to make sure I'm fully awake—I wade into the hot-water pool. At a scorching 50 degrees Centigrade (122°F), the water makes my arms and legs tingle madly with heat. When I stoop to bring the water to my chest, the shock of the heat takes my breath. Perspiration quickly forms and flows on my brow. I was told not to stay in longer than 10 minutes—it won't be hard heeding that advice! In less than half that time, I know I'll never again look at a boiled chicken in quite the same way. I emerge lightheaded, and plunge into a cold shower that somehow doesn't feel so frigid anymore.

When I lie down to rest, I find myself next to a former justice of Jordan's high court. He is, he tells me, a "regular" at Ma'in. Twice my age, he dips in and out of the hot pool with enviable ease, and he credits his vigor to his visits to the spa. "I have been all over the Arab world and visited Russia," he says, "but I have never seen another facility like this."

Next stop is the whirlpool, where the thermometer indicates a mere 42 degrees Centigrade (108°F). As the physiotherapist adjusts the settings, I settle into the tub. It's hot, but strangely refreshing compared to the far hotter pool. This, I think, could be truly relaxing. My helper fires up the jets and the pulsating water cycles around the tub, buffeting and massaging my muscles. After 10 minutes, I'm relaxed and invigorated, and ready for the hot mud. Or so I think.

In another room, the physiotherapist slips on an industrial rubber glove—the kind one might use to handle a toxic substance—and casually asks how I respond to a touch of heat. I'm not sure what to say—"As well as anyone else, I suppose." A machine at the end of the room produces a fiery-hot blob of greenish-brown muck, brought over to Ma'in from the Dead Sea. As the physiotherapist smears it on my back, I arch in pain. "Does this ever cause blistering and burns?" I wince. "No, never," is his confident reply, punctuated with another glob. I somehow resist the urge to roll off the table and escape.

Soon I'm not only covered in the steamy sludge, but also wrapped in plastic and covered in blankets. Left alone, I feel like a cabbage roll being steamed. But slowly, my attempts to persuade myself that this torture must be good for me begin



to succeed. My apprehensions trickle away with my sweat. If there was anything else to purge from my system, it has surely fled by now.

The hot spring water of Ma'in contains a number of apparently curative agents. The most important element is the heat itself, which averages 56 degrees Centigrade (133°F), but in some of the five dozen springs around Ma'in can reach as high as 63 degrees (145°F). It improves skin circulation by dilating the superficial arteries, which allows an easier flow of blood. As anyone who has ever relaxed in a warm bath knows, the heat also relaxes muscles, thereby easing joint pain. High sulfur levels in the water serve as a tranquilizer for the respiratory system, making breathing easier. Some visitors drink the water, but only after it stands, cooling, to dissipate the radon gas it contains, which is harmful if taken internally. Ingested, the high levels of carbon dioxide act like seltzer in aiding digestion.

Centuries of deposits from the mineral-rich waters have painted the cliffs of Wadi Ma'in, where the waters flow into the Dead Sea (right).

Not all who come to Ma'in, however, come for the spa. The natural springs are open to the public, and on Friday mornings they are especially full as entire families often bring picnics. Women and children clamber on rocks and wade in the waters of the stream below the steamy plume of the *shallal*, while young men often opt for higher ledges under hot cascades. Some stay the night, sleeping under the stars and enjoying the desert evening while soaking in effervescent luxury.

According to geologists, the springs were formed when this part of the earth's crust began a process called rifting. Responding to magma flows deep below, the rock plates that make up the earth's crust pulled apart and, over tens of thousands of years, formed deep valleys. In the Middle East, this movement has produced an enormous rift stretching nearly 3000 kilometers (1900 miles) from western Syria southward all the way to the Gulf of Aden, including both the Red Sea and the Dead Sea.

Dr. Elias Salamah, professor of hydrogeology at the University of Jordan, explains that as the Arabian Peninsula moves slowly east and Jordan moves north, the Red Sea widens by about four and a half centimeters (1¾") each year—three times the rate of rifting in the mid-Atlantic. "This is what we call an active geological zone," Salamah says.

The rifting is responsible for the nearly 200 hot springs in Jordan, for it allows surface water to reach deep, hot underground levels and eventually circulate back to the surface. Radioactivity and volcanism heat the water, underground and under pressure, as high as 130 degrees (266°F), but it cools as it moves toward the surface. Geologists estimate that the water at Ma'in has been underground for at least 3600 years.

A few kilometers from the springs, the stream empties into the Dead Sea, the lowest-lying body of water on earth, whose salt content is eight times that of most oceans. Intense sunlight and less than 10 centimeters (4") of annual rainfall have created a unique, fragile community of flora and fauna around the Dead Sea, many of whose 300 species of plants are found nowhere else. *Zaqqum* trees (*Balanites aegyptiaca*) dot the hills; the local name refers to the tree mentioned in the Qur'an "that springs out of the bottom of Hell-fire," and whose bitter fruit is the food of the damned. There is also the *yusur* tree (*Miringa peregrina*), with its brittle branches and delicate pinkish-white flowers,

which produces 30-centimeter (12") pods whose beans have been used for generations to make the *misbaha*, the so-called "worry beads." These are popular in some parts of the Middle East with both Muslims and Christians, who use them in their devotions.

Along the barren and rocky shoreline, the Dead Sea Spa Hotel, like its cousin in Ma'in, has become a haven for what the industry calls "medical tourism." The high oxygen content of the air 400 meters (1280') below sea level relieves bronchial asthma. On the women's side, I was told, mud is used for the notorious "mud facial" that is believed to remove wrinkles. The mineral-laden waters of the Dead Sea, combined with the dry air, hot sun and mud, have also proved to be uniquely helpful in healing more than 80 types of psoriasis, a painful disease of the skin. As the spa's doctor told me, "You can't take the waters of the Dead Sea to Scandinavia and do what we do here!"

Psoriasis patients spend up to eight hours a day in the spa's solarium, seven days a week, alternating sun with shade to avoid sunstroke and heat exhaustion. Under supervision, the heat, occasional mud, small amounts of water and more heat gradually dry and close their sores, taking patients to progressively higher levels of healing.

The spa attracts patients from Europe, particularly from Germany, Austria, and Switzerland, where government medical insurance pays for the three- to six-week stay required for effective treatment. And the hotel recently signed a contract with the Psoriasis Association of Italy to treat Italian patients. But many visitors pay their own way, too, says Kamel Ajami, general manager of the hotel. "They like it because it is quiet here."

Geologists estimate that the water at Ma'in has been underground for at least 3600 years.

As at Ma'in, I am permitted by the staff to sample some of the therapies. I head for the solarium, where the late morning sun burns the dry air and bakes my limbs. It's no wonder everyone else keeps a bottle of olive oil at hand to protect from sunburn. I apply some mud to my hands, and as I do, I am warned that it is caustic, and should not be left on the skin for more than 10 minutes at a stretch. Remarkably, when the time is up and I wash it off, my hands do feel looser and less stiff. All around me, my fellow patients liberally slather elbows, knees, shoulders and hands with the hot, sticky stuff. I retreat to the shade of an umbrella, away from the wilting power of the sun.

Reiner Erhard of Munich, I find, is among those who have come to the Dead Sea from Europe. Like his grandfather, father and uncles, he suffers from psoriasis. Now on his third visit to the Dead Sea, he said he has experienced more healing each year, and he entertains unprecedented hopes. "It is gradually going away. I can now play sports like tennis that five years ago I could not."

As the shimmering sun drops over the hills and the saline waters lap heavily against the shore, the steaming waters of Ma'in, hidden now in the steep wadi, splash over rocks nearly as old as the earth itself. To the centuries of visitors and cure-seekers, they are more than natural wonders: They are waters that heal.

Free-lance writer Kirk Albrecht and veteran Aramco World *photographer Bill Lyons are based in Amman.*

▶ *Inside back cover: A curving dam of piled-up rocks, built by local bathers, makes a steamy-hot outdoor pool to relax in.*

Genghis Khan: *Treasures From Inner Mongolia.* This unprecedented collaboration between the United States and China explores 3500 years of culture and history in a land that produced one of the world's greatest conquerors. Royal **British Columbia** Museum, **Victoria, Canada,** March 25 through September 10.

Teaching About the Arab World and Islam is the theme of teacher workshops cosponsored by the Middle East Policy Council in Washington, D.C., and conducted by AWAIR, Arab World And Islamic Resources and School Services in Berkeley, California. Confirmed sites and dates include: **St. Joseph, Missouri,** March 30; **Walnut Creek, California,** April 1; **Tyler, Texas,** April 8; **Salem, Oregon**, May 12; **Norman, Oklahoma**, May 20; **Alameda, California,** June 20 and 21; **Columbus, Ohio,** June 27 and July 14 through 15; **Tuscaloosa, Alabama**, June 28. For details, call (202) 296-6767 or (510) 704-0517.

EVENTS & EXHIBITIONS

This 16th-century shield is made of wicker with silk and metallic embroidery and steel inlaid with gold.

Treasures of the Sultans: *Masterpieces from the Topkapı Palace* is unique not only because it marks the first United States exhibition to focus exclusively on the collections of Topkapı Sarayı, the imperial complex from which the Ottoman Empire was ruled for more than 400 years, but also because it is scheduled for display in no other city. Many of the 85 objects are elegant or extravagant works of jewelry, carving and metalwork from the famous Topkapı treasuries (See *Aramco World*, January-February 1995). Others convey a picture of daily life at the palace, which at its height was itself a small city of nearly 5000 people. The exhibit includes as well Iznik ceramics, illuminated manuscripts and copies of the Qur'an, and textiles of silk and metallic brocade. It appears in conjunction with the celebration of Turkish art at the 10-day Houston International Festival, which from April 20 through 30 showcases Turkish music, cinema and other traditional and contemporary arts and crafts. Museum of Fine Arts, **Houston,** April 23 through June 11.

An Ancient Egyptian Bestiary: *Animals in Egyptian Art* displays roughly 150 pieces exploring the art of animal representation in sculpture, relief, painting and the decorative arts. Metropolitan Museum of Art, **New York**, April 12 through October 15.

Byzantium: *Byzantine Treasures From British Collections.* Brought together from public and private sources, the exhibition highlights the empire's accomplishments in arts, letters and science, through painted icons, illuminated manuscripts, textiles, mosaics and other artifacts. British Museum, **London,** through April 23.

Forces of Change: *Artists of the Arab World* seeks to demystify the region and its women through this exhibition of 160 artworks by 70 contemporary Arab women artists from 15 countries. Most exhibitions are accompanied by a series of lectures, films and workshops. Gwinnett Art Center and Nexus Contemporary Art Center, **Atlanta,** through April 29; Bedford Gallery, **Walnut Creek, California,** June 14 through August 20.

Ancient Nubia: *Egypt's Rival in Africa.* More than 200 artifacts help trace the history of Nubia over a 3500-year period. The exhibition includes statues, inscriptions, vessels and personal adornments. **Rochester [New York]** Museum and Science Center, through April 30; National Museum of African Art, **Washington, D.C.,** May 24 through September 4.

Paintings from the Muslim Courts of India examines similarities and differences between miniature paintings and manuscript illuminations produced from the 16th to the 19th centuries for the Moghuls and the sultans of Golconda, Bijapur and Ahmadnagar. **Virginia** Museum of Fine Arts, **Richmond,** through April 30.

Reflections of Women in the New Kingdom: *Egyptian Art from the British Museum.* More than 100 sculptures, statues, papyri, jewelry and decorative arts explain the many ways women were perceived in ancient Egypt. Carlos Museum, Emory University, **Atlanta,** through April 30.

Rugs and Textiles of Late Imperial China. The expansion of China to nearly its present boundaries under the Qing Empire (1644-1911) brought artists skilled in the highly developed southeastern arts of silk production to the previously separate, more utilitarian wool production of the north. A wealth of little-known rugs, robes and other domestic weavings resulted. Textile Museum, **Washington, D.C.,** through April 30.

Current Archeology of the Ancient World. A series of talks on current research and discoveries. Among upcoming Middle Eastern or Islamic topics: "Excavations at Tell Afis in Syria," S. Mazzoni, May 12; "Sumerian Society and the Coming of the State," J.D. Forest, June 2; "The Survival of Hellenistic Culture in Central Asia," P. Bernard, June 26. Auditorium, Musée du Louvre, **Paris,** 12 o'clock noon.

The Emergence of Indonesia: *Photographs by Cas Oorthuys and Charles Breijer, 1947-1949.* On the 50th anniversary of independence in 1995, 80 photographs of ordinary people, soldiers and leaders on both sides depict the decolonization of Indonesia. Museum voor Volkenkunde, **Rotterdam,** through May 28.

Art of Nigeria From the William S. Arnett Collection. Held in conjunction with the National Black Arts Festival, this exhibit includes 100 of the Southeast's most important African art objects. Featured are sculptures from Africa's leading oil-producing nation, a country with a substantial Muslim population. Carlos Museum, Emory University, **Atlanta,** through May 31.

Princely Patrons: *Three Royal Persian Manuscripts* highlights manuscripts illustrated for members of the ruling Timurid house in the 15th century, a period during which the classical canons of Persian painting were established and the "art of the book" reached its height. Metropolitan Museum of Art, **New York,** through June 4.

Pilgrim of the Pen: *Ghani Alani, Master Calligrapher.* Alani, an Iraqi-born artist living in Paris, has mastered all historical variants in Arabic calligraphy, and also plays a part in new developments in the field. Museum voor Volkenkunde, **Rotterdam,** through June 11.

Threads of Tradition: *Ceremonial Bridal Costumes from Palestine.* Wedding dresses, headpieces and scarves from the extensive collection of Farah and Hanan Munayyer show each of the major regional styles of weaving and embroidery at its finest. Fuller Museum of Art, **Brockton, Massachusetts,** through July 2.

Nomads in Central Asia uses more than 1,000 objects from the Russian Ethnographic Museum in St. Petersburg to take the visitor on a journey to the mountains and steppes between the Caspian Sea and China. Displays include ordinary and decorative clothing, saddlery, precious jewels, woven fabrics, musical instruments, a traditional tent and the outfits of Kazakh warriors. Tropenmuseum, **Amsterdam,** through August 20.

Djenné: *The Most Beautiful City in Africa.* As the oldest city in sub-Saharan Africa, Djenné, Mali, played major roles in both trade and the development of a regional Islamic culture. It also developed a renowned, spectacular form of mud-brick architecture, which is highlighted in this exhibit. Rijksmuseum voor Volkenkunde, **Leiden, Netherlands,** through August 27.

The Saudi Aramco Exhibit. Centered on the Arab-Islamic technical heritage, this permanent interactive, "learn-by-doing" scientific exhibit relates the historical background to today's petroleum exploration, production and transportation. **Dhahran, Saudi Arabia.**

Information is correct at press time, but please reconfirm dates and times before traveling. Readers are welcome to submit information for possible inclusion in this listing.

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