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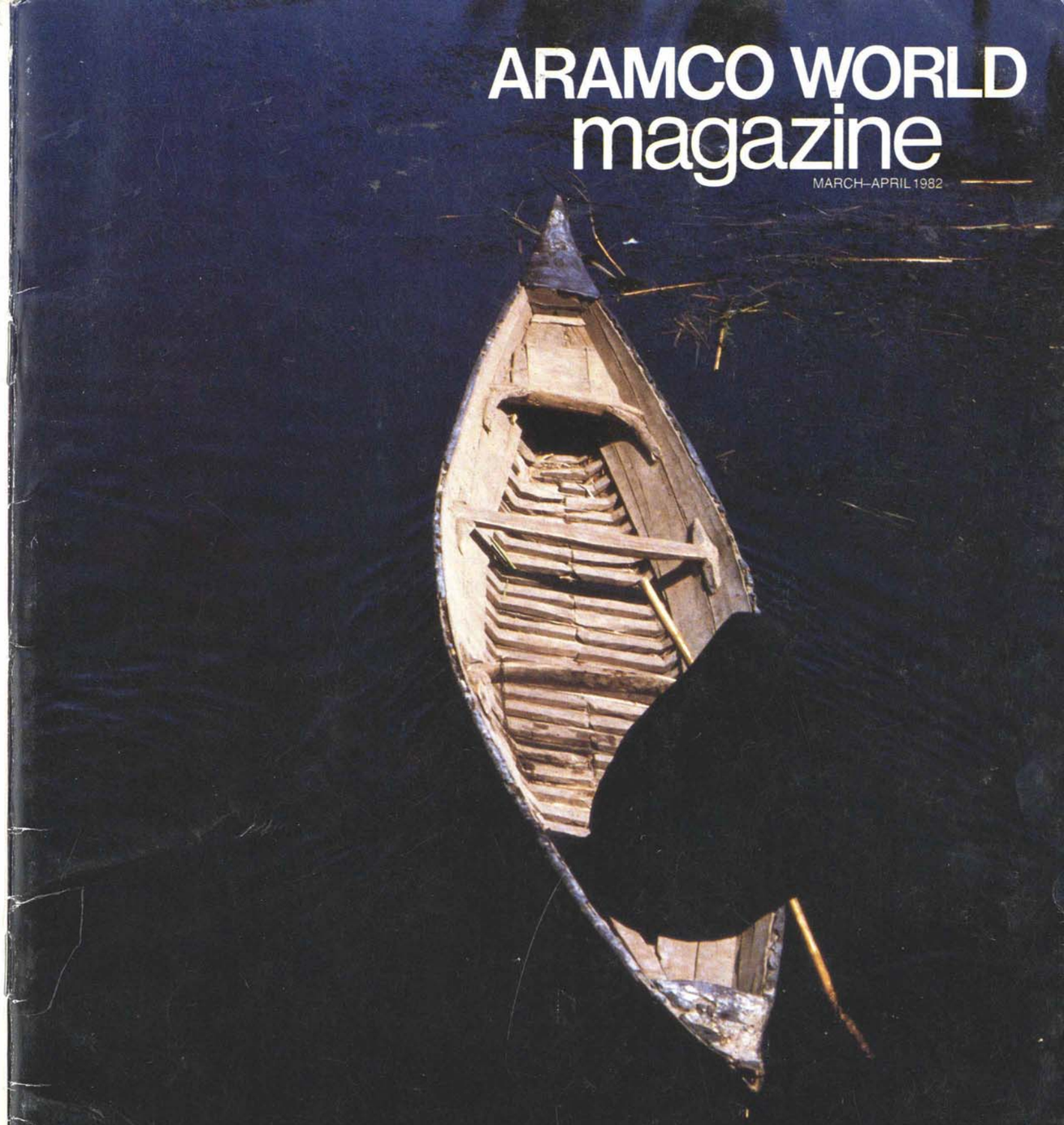
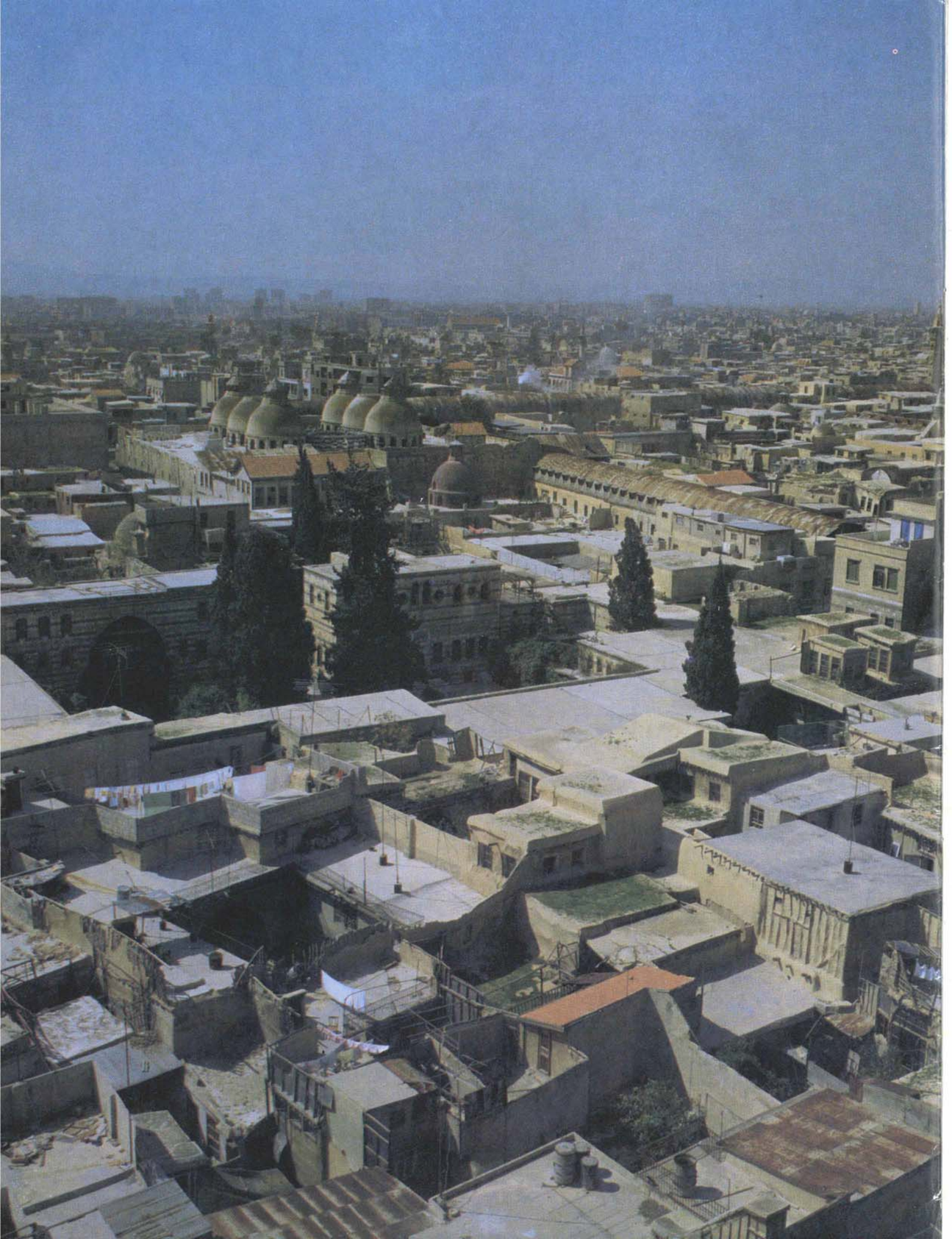
MARCH–APRIL 1982



THE MARSH ARABS REVISITED



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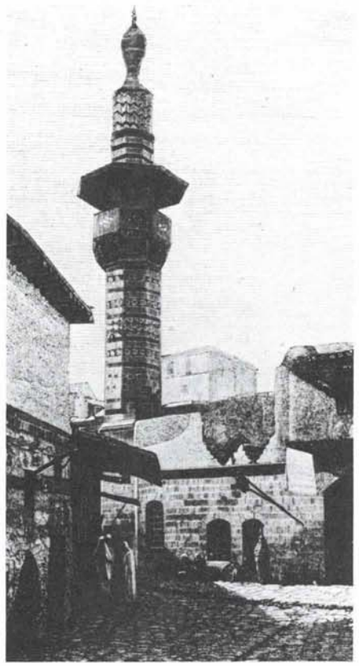
Cover: In his book *The Marsh Arabs*, Wilfred Thesiger described, in lyrical tones, the beauty of the great Marshes of Iraq: "... canoes moving ... down a waterway ... stars reflected in dark water ... reed houses ... the stillness of a world that never knew an engine..." Today that idyllic world has changed radically, but, as this photograph and another on the back cover suggest, the Marsh Arabs still preserve such tangible traces of their ancient life-style as the light, agile *mushhuf*, their chief means of transport, and still build in a tradition that Thesiger called Romanesque in reeds. Photos by Michael Spencer.

◀ An overview of the old city of Damascus showing the Khan As'ad Pasha in the foreground and the magnificent domed tomb of the Mamluk Sultan Baibars in the background.

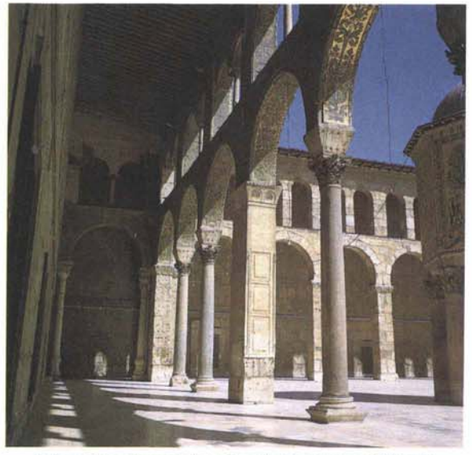
Restoration of Damascus



Above: The Umayyad Mosque and a minaret
Center: Damascus' ancient quarter with, in the foreground at left, the enormous Corinthian columns of the Temple of Jupiter, erected during the Roman period, and, to the right of the temple, the Via Recta or the "Street Called Straight" leading to the famous covered suq called the Hamadieh Suq.

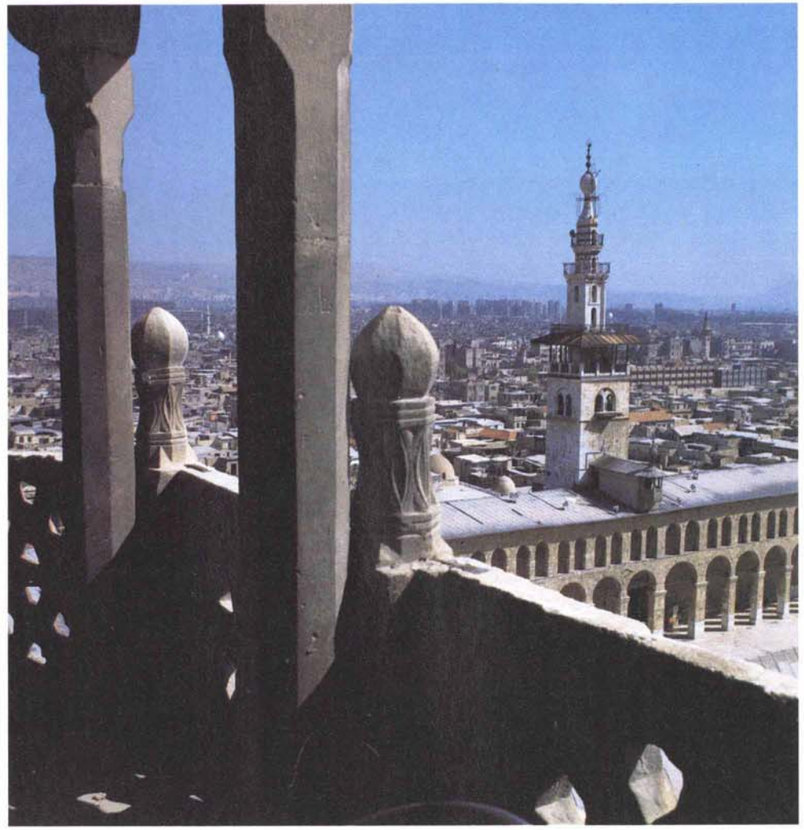
After 8,000 years, Damascus, the oldest continuously inhabited city in the world, is about to have her first facelift.

The precise age of Damascus is open to debate and some historians say other cities – Byblos in Lebanon and Aleppo to the north – are older. But the evidence in favor of Damascus seems overwhelming. Neolithic finds from Tell Ramad on the outskirts verify that the site was occupied as early as the seventh millennium B.C.; third-millennium cuneiform tablets recovered at Ebla (see *Aramco World* March-April 1978) refer to Damascus by its present name, *Dimashq*; Egyptian texts of the 14th century B.C. mention Damascus; and Old Testament references suggest that Damascus was regarded as ancient in the ninth century B.C. Just on the basis of age, therefore, restoration of Damascus would be extraordinarily difficult; her wrinkles go deep. But Damascus is also very large. During the Roman period, Damascus was as big as Rome itself – and 10 times the size of Paris – and even now its ancient quarter is much larger than those of many capital cities in Europe.



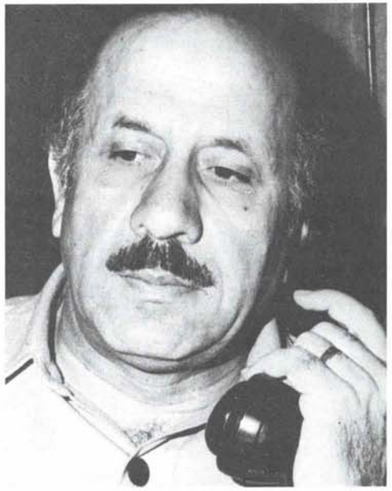
A view of the colonnaded courtyard of the Umayyad Mosque.

Restoration plans, moreover, are ambitious. "Our goal isn't solely to buy deteriorating historical buildings and restore them as empty relics of the past," said Dr. Afif Bahnassi, Director General of Syrian Antiquities and Museums. "We don't want to create a ghost town of monuments, we want to revitalize the old city by restoring centuries-old homes and public buildings and to bring back residents who have moved to suburbia."



A view of old Damascus with, at center right, a high and imposing minaret of the city's famous Umayyad Mosque.

As in many cities in the United States, the move toward preservation came as a result of urban sprawl; in 1970, for example, major building projects began to re-shape Damascus and threatened its wealth of historic buildings. Alarmed by this, the Department of Antiquities, in 1976, organized a commission to oversee the protection of Old Damascus, and soon after the area within the original city walls and its seven gates was declared a "cultural property", in which future building, manufacturing and the dismantlement or destruction of edifices were forbidden. "Even repairs must now be approved by the Department of Antiquities," Dr. Bahnassi said.



Afif Bahnassi, director, Syrian Antiquities and Museums.

In itself, that move was a substantial challenge. "Capital cities of Europe take great pride in their ancient quarters which, in terms of area, are miniscule in comparison to the old city of Damascus," Dr. Bahnassi said. "The walls and ramparts of old Damascus very clearly mark an area of 1.36 million square meters or about 140 hectares (346 acres). The eastern gate, Bab al-Sharqi, dates to the Roman period and opens onto the Roman road, the Via Recta or Street Called Straight. Six of the old city gates were built in medieval times – the 12th to 15th centuries."

But Damascus plans to do more than simply preserve what's there; it also wants to restore its national treasures: some 100 historical public monuments that have withstood earthquakes, fire and the ravages of time. Among them are 50 mosques, 30 public baths, 12 caravanserais and seven 12th- to 15th-century schools. In addition, Dr. Bahnassi said, the Department hopes to restore an estimated 300 houses of 18th to 19th-century vintage – an exciting as well as a challenging project.

"Traditionally, Arab houses were large, having as many as 18 rooms to accommodate the patriarch, his sons and their families. But after World War II, as sons tended to move into their own homes, and servants, needed to maintain large dwellings, became too expensive, elderly couples had no choice but to close off sections of their homes.

"Then when the old people died, the heirs left the houses deserted or rented portions of the dwellings to villagers and others moving into Damascus. In some cases, as many as eight to 10 members of a single family rented one or two rooms which led to overcrowding and rapid deterioration of some of the loveliest old homes in the ancient quarters.

"You might say," Dr. Bahnassi continued, "that the biggest problems we confront are uninhabited, deteriorating houses which we can't afford to buy, and the uninterested owner's policy of renting family homes to too many people or to traders who use them as warehouses."

To cope with these problems is difficult, he said. "The Department of Antiquities has funds to purchase one to three old dwellings each year. This is not sufficient to save the great number of houses that are rapidly deteriorating from desertion, overcrowding and misuse by businessmen. And even if it was sufficient, we must relocate the villagers and refugees. No matter how rare or historically valuable an old house is, the Department of Antiquities cannot simply purchase it and evacuate the tenants. We must find housing for them or pay the difference it will cost them to live elsewhere."

Restoration of these homes, nevertheless, continues to excite Department of Antiquities planners. They say that whatever its scale, restoration is the way to salvage these treasures – and they're happy to give examples. One is Bait Jabry, an elegant 28-room mansion reached by the streets that wind northward from the Roman Arch on the Street Called Straight to 40 Swaff Road. Although virtually deserted since 1972, this proud old house exhibits vestiges of elegance the onlooker can't miss: damask roses, jasmine, citrus trees and vines flourish untrimmed in the courtyard whose tiles were laid more than two centuries ago.

So far, 10 generations of Jabrys have lived in the mansion and Aghyad, grandson of the present owner, is determined to keep it in the family. "My roots are here," Jabry says. "Why should I ever consider moving to an air-conditioned box in the suburbs?"

With the help from the Department of Antiquities, therefore, Jabry is trying to renovate Bait Jabry. In January for example, the department agreed to supply architects, stone masons and carpenters to restore the house, and Jabry agreed to pay the department on a long term basis.

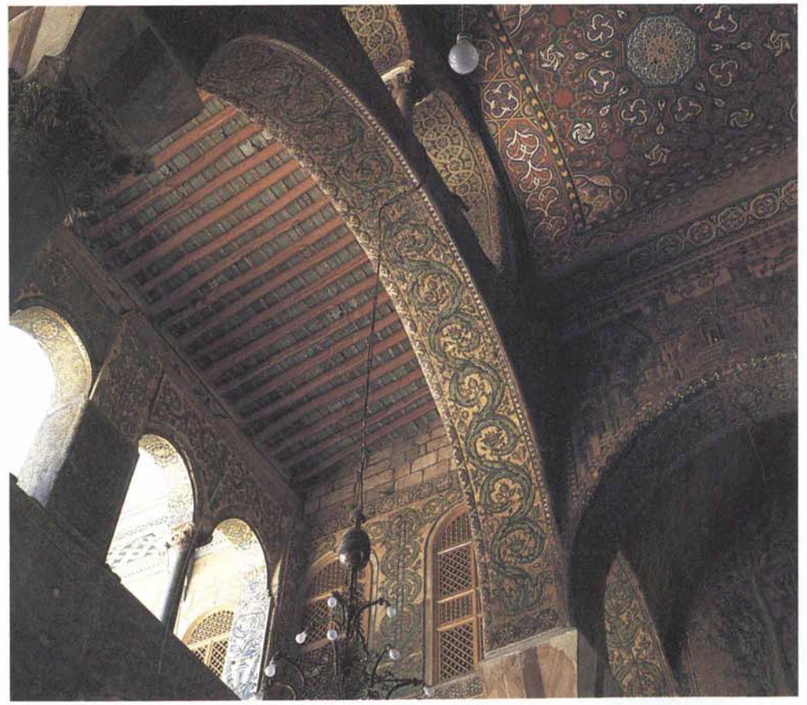
It will not be cheap. There are 110 windows in the crumbling palace, and 57 panes must be replaced; the roof over the south-east corner, damaged by water, is being rebuilt; and the 12-meter ceiling (40 feet) of the *iwan* – an extended balcony – requires a forest of scaffolding for work on a 200-year-old mirrors set into handcarved beams.

Like numerous counterparts in the United States, who have chosen an anachronous life style, Mr Jabry has taught himself carpentry and weaving and is simultaneously repairing the walls and doors and weaving fabrics for salon furnishings and draperies. But there are limits to what he can do himself. The mansion's doors, for example, are one-of-a-kind, the first in Syria paneled in marble, which only highly skilled craftsmen can repair, and there are massive cedar-wood window cornices which, Mr Jabry says, "were carved by the grandfather of my grandfather."

The whole mansion, in fact, is a craftsman's dream. Room after room displays the ultimate in 18th-century Damascene ceilings – hand carved and painted beams whose designs were intended to – and could – compete with the motifs woven in the oriental carpets. One salon is decorated with murals of steam-powered ships which called at Beirut in the 1840's and a tile in the main reception salon bears a calligraphic inscription stating that the house was completed in 1158 A.H. (1745).

Another resident of Old Damascus who is determined to stay is George Arida, whose 14-room, 19th-century home standing amid a courtyard rich in ferns, palm trees and roses is a prime example of an upper-middle-class residence in the Christian quarter of Old Damascus. "I love this house and I hope my daughters will live in it after I'm gone," he said.

A third example is the Dahdah Palace, south of the Roman Arch on the Street Called Straight. An 18-room dwelling, the place was constructed more than 300 years ago by a Turkish pasha. Now owned by George Dahdah, whose family has had it for more than 50 years; Dahdah alone has spent well over 500,000 Syrian pounds to restore it.



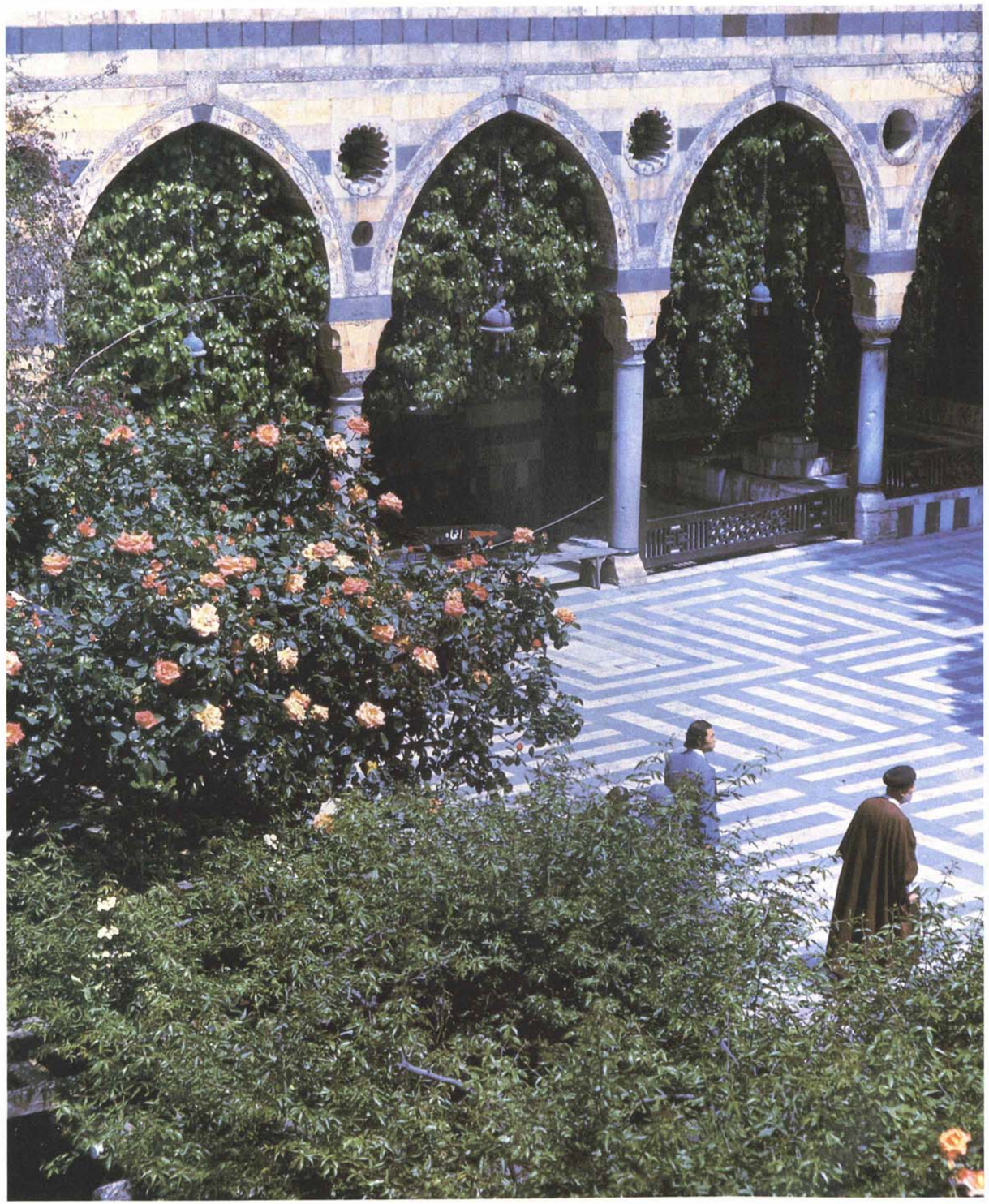
Contributing to the beauty of the Umayyad Mosque are these elaborately inlaid and decorated arches and ceilings.

In addition to mansions there are other structures that the department hopes to preserve. Bait Nassan is the only remaining factory of hand-loomed Damascene silk in Syria. The factory, located outside the city walls, directly north of Bab Sharqi, is on the verge of closing.

Fortunately, this will have no effect on the mansion inside the walls. The Nassan family purchased the dwelling in 1866, when it already was 115 years old, invested a small fortune over a century ago to restore and expand it and opens it on special occasions to such guests as the Agha Khan and the late Charles De Gaulle. As a result the Nassan family has opted to remain in the building, a choice that the Department of Antiquities hopes more established families will imitate.

"As we restore gracious old homes, we're encouraging the owners to return to them so that in the future, visitors can see how Damascenes once lived," Dr. Bahnassi said. "We hope to transform classic Arab dwellings – such as the Jabry home – into restaurants, as was done in Beirut before the war, and guest lodges, convert palaces into museums or small intimate inns and restore old baths and caravanserais so that the public can use them as they were centuries ago."

Projects on this scale, obviously, require both expertise and money and Damascus, fortunately, has received both on an inter-



Damask roses surround the courtyard of the 'Azm Palace, the beautiful 18th-century structure recently reopened as the National Museum of Arts and Popular Traditions.

The Palace of Memories

More than 25 years before it launched the campaign to restore the Old City of Damascus, the Syrian Department of Antiquities and Museums had already refurbished and furnished the 18th-century 'Azm Palace and opened it to the public as a National Museum of Arts and Popular Traditions — today the most popular attraction of Old Damascus after the Umayyad Mosque.

A complex of gardens and reception halls, in which mannequins attired in authentic costumes of various periods and areas recreate Syrian life styles of the past, the palace is largely the work of Shafiq Imam, the museum director.

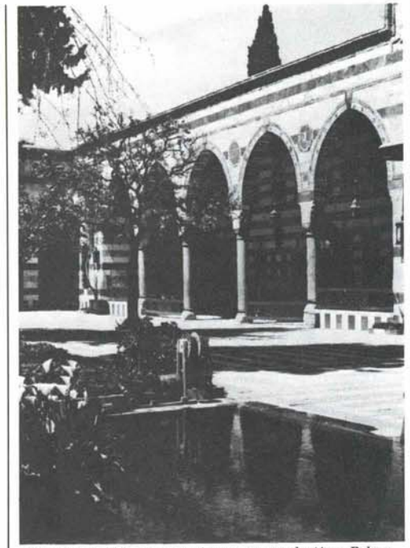
"In 1952," he said, "the Department of Antiquities decided more attention should be paid to national ethnography . . . and I went to work gathering furnishings and every imaginable relic from out of our past to display in the museum."

That was the beginning of a search that has subsequently turned up 4,000 examples of Syrian apparel dating from the 18th century to the present. It was not, however, as easy as it sounds.

"I called on villagers dressed in old clothing and introduced myself . . ." he recalled. "In that way, no one regarded me as an outsider from the big city. The people welcomed me into their homes and whenever I spotted something very old or of remarkable craftsmanship, I expressed my admiration and bought it. Before leaving, I would give the people my address and ask them to visit me in Damascus. When they did so, I would show them the acquisitions I'd purchased from them on display and then ask for additional details on their history and manufacture. If I'd shown too much curiosity during my buying trips, the people would have grown suspicious and possibly would have withdrawn their hospitality."

Meanwhile, the Syrian government had taken full possession of what was to be the National Museum of Arts and Popular Traditions: the handsome square 'Azm Palace, a structure that covers 5,500 square meters (59,200 square feet) and contains 16 halls, 19 small basement rooms, nine second-story rooms, a portico with five arches, 14 fountains, several kitchens, a five-room hammam, *five inner courtyards and an exterior courtyard originally intended for horses.*

Divided into three main sections — the salamlik, *for men, the* haramlik, *or women's quarters, and the kitchen and bath-house, or* hammam, *the palace is spacious as well as beautiful. Furthermore, Imam said, its origins may go back into Islamic history. Some Damascene historians say it was the first palace of the first Umayyad caliph, Mu'awiya, and there is evidence that, during the Mamluk period, the site housed a treasury where coins were minted.*



The Haramlik *or women's quarters at the 'Azm Palace.*

During the Ottoman period, the governor of Damascus, As'ad Pasha al-'Azm, purchased the grounds and built a residence on the site; to meet his exacting specifications, private houses were bought and dismantled for the project, and the finest specimens of bougainvillea, jasmine, roses and cypress trees were planted in the courtyards. The most renowned architects, carpenters, stone masons and artisans were hired and after three years, the palace was completed in 1749.

As the location for a museum, the 'Azm Palace — sometimes confused with the 'Azm House which has also been restored and opened as the Damascus Historical Museum — was perfect. At the opening, though, Imam and his colleagues were anxious. "It was the first time such a venture had been attempted in Syria and we feared that since most people had the same objects in their homes, they wouldn't feel it worthwhile to come and see them displayed here."

As it turned out, their anxieties were for naught. Indeed, they were amazed at the popularity the 'Azm Palace received from the first day its doors were opened.

Today it is easy to see why. In addition to its striking setting the museum offers a marvelous variety of exhibits. In the first room, for example, spectators will find priceless pieces of Chinese porcelain and Bohemian crystal — remnants from the 17th century when Damascene families often ordered personalized motifs on ceramics from China — as well as delicate stemware, lamps and vases specially made in Bohemia for 18th century Damascene clients.

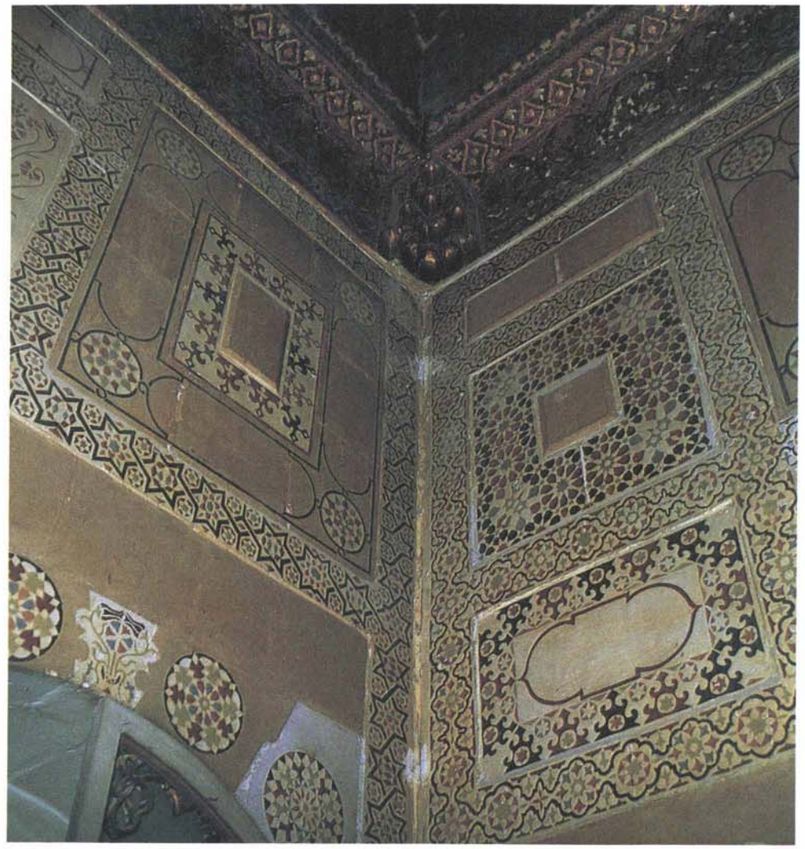
Other rooms in the 'Azm Palace recreate 19th-century scenes: a young bride being prepared for her nuptial ceremony by women attendants; a pasha holding a reception in the company of his deputy and secretary; a Bedouin tent; a villager of the Jabal al-'Arab area serving coffee to his guests; a late 19th-century Damascene coffee house replete with a storyteller, phonograph, flickering light machine and men playing trik-trak.

In another display, mannequins are attired as male and female pilgrims to Makkah and yet another room features an Ottoman mahmal, *a gold brocade tent which was placed on the camel leading the pilgrimage procession to Makkah. There are also displays of rare calligraphy: an egg, on which the entire Koran is written, and a grain of wheat — displayed under a magnifying glass — bearing an incredible amount of calligraphy.*

Visitors can also see displays of Syrian handicrafts: weaving, glass blowing, copper and leather working and massive wood blocks used in printing Syrian cottons.

To Imam, handicrafts are more than museum exhibits; they are echoes of a vanishing world. "Our handicrafts are dying," he said. "In the past, the entire family produced these crafts. Now men leave the countryside for the city or the Gulf, women are busy doing the men's chores and handicrafts die out as machine-produced goods replace them at a lower price. I continue to go into the villages and commission the people to make me fabrics, then I do my best to find Syrian or foreign markets for them."

Imam didn't say whether that approach was helpful in preserving handicrafts, but in his description of the folk museum he eloquently expressed what his, and his department's, approach is based upon: enthusiasm and dedication. ■



Among the architectural treasures that Syria is renovating is Bait Jabry, a beautiful 250-year-old Damascene mansion.

national basis. In 1978, for example, when Dr. Bahnassi called for the formation of an international committee to preserve the old city, the response was immediate and a year later, in April 1979, participants from France, West Germany and the United States set to work on projects with Syrian colleagues. This international commission meets three times a year to review the progress of four committees which are tackling four areas critical to the preservation of Old Damascus.

One committee, under Dorothea Sack of West Germany, who is preparing her doctoral dissertation on the urban problems of Old Damascus, has prepared sets of maps, which cover the "intra-muros" (within-the-walls) area of the old city. To do so, she has, with the aid of Syrian collaborators, interviewed nearly every resident of the old city and prepared exact sketches of houses as they once were. On another set of maps she has indicated which houses are worth preserving – and on still another set has indicated mosques, shops, schools and other public buildings.

Other areas lie outside the walls. Mindful that many jewels of Islamic architecture exist outside the old city walls, the Department of Antiquities has assigned Jean-Paul Pasqual of the Damascus French Institute to research Maidan, Bab al-Jabiya, Suq Saruja and Qanawat, and has asked Dr. Michael Meinecke of the Damascus German Archaeological Institute to map Salhyeh, a 19th-century summer resort of Damascus where such luminaries as Sir Richard Burton and Lady Jane Digby lived. Dr. Meinecke has already identified and documented more than 20 public monuments dating from the mid-11th century onward.

A final area of study is a demographic-socio-economic survey which the Syrian, French and German experts are doing jointly by distributing questionnaires by hand to every known resident of the old city. "From these questionnaires we hope it will be possible to determine how people lived in the old city in the past and what their needs are if they remain there," Dr. Bahnassi said.

"Very recently, I walked the streets of the old city with the governor of Damascus. Over and above the words of the specialists, we wanted to learn from the residents themselves what their connection is with the suqs and the services within the city.

"We came up with some disturbing facts. More than 500,000 people are in the old city during the daytime but less than 15,000 live in it at night. Because of the low rents, merchants are using the old city as just a center of trade for everything from used tires and flashlight batteries to plastic wash tubs and transistor radios. What's worse, they have their factories and storehouses here.

"Our chief task is to determine how to evacuate these undesirable elements and it seems that to do so we must establish a new market place for them. Old Damascus can thrive alone on its traditional markets and crafts shops of brassware, woodwork, glass and carpets. Let the industrialized trades go to another center. We wish only to encourage handicraft trades to remain in the old city within their historical framework."

An arch in the 'Azm House, now a historical museum.

The city fathers of Damascus, concerned with faulty and dangerous electrical wiring throughout the area, are also enforcing new safety codes and are trying to diminish the amount of auto traffic in the narrow streets. Last, to improve the appearance of the city, a special establishment has been organized to distribute paint, cement and other building materials to residents, particularly renter tradesmen, who will be obliged to repair and restore the premises under the guidance of museum officials.

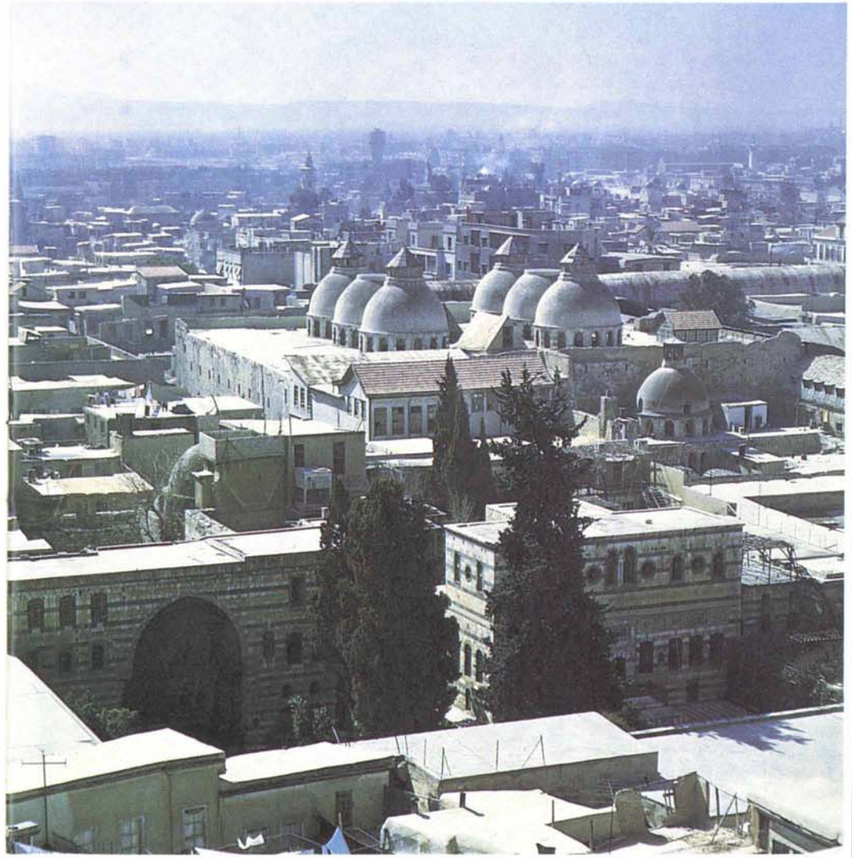
Since 1976, the Department of Antiquities has also carried out a number of restoration projects. One was a Mamluk edifice, Madrassat Jakmakieh, which now houses the Damascus Epigraphy Museum, and another, a must on any tour guide's itinerary, was the Bimaristan Nureddin.

A hospital constructed in A.D. 1155, Bimaristan Nureddin, now the Museum of Medicine and Science, is the result of more than five years of research and reconstruction. Regarded as a prime example of Ayyubid architecture, its red painted stalactite ceiling contrasts with its sparkling white stucco walls and visitors can see balconies where 21 physicians (ophthalmologists, internists and surgeons) once treated up to 300 patients at one time. In addition, there are replicas of medieval surgical instruments, pharmaceutical equipment and large photographic reproductions of miniatures of early Islamic physicians at work. A charming example of its use as a working museum is that the Syrian Society of Astronomy meets here using a telescope bought by the department. Society members this summer will operate the telescope for the public in the open courtyard.

In May of 1980, the Antiquities Department also opened the 19th-century 'Azm residence of Suq Saruja as a historical museum. The two-courtyard, 16-room home serves as a conference hall, exhibition gallery and library. Its inauguration was marked with an international conference in which scholars presented papers and showed vintage photographs of Old Damascus.

The latest project is the Hammam Nureddin, a bath house constructed in 1155. For more than seven centuries, the structure was in use. Then at the beginning of this century, it fell into use as a warehouse and the interiors were extensively damaged. The Department of Antiquities purchased the building in 1977 and restoration began under the guidance of specialists from Damascus National Museum.

One of the chief obstacles in restoring the hammam was that many original building materials no longer exist or are too expensive to replace. This is the case of semi-precious stones which were inlaid in the walls. Colored glass has been substituted. The actual bathing rooms are tripartite: a cold room, medium hot room and a steam room. One major departure from the original outlay is a concession to 20th century innovations, namely a large wooden cage containing a sauna.



Foreground: The National Zahariya Library of Syria. Center, the domed tomb of the Mamluk Sultan Baibars built in 1277.

A courtyard at Bimaristan Nureddin, now a museum.

"We hope the restoration of Hammam Nureddin will set an example for proprietors of other bath houses to refurbish their establishments," Dr. Bahnassi said, noting that in the 19th century there were more than 100 bath houses in the old city. Today about 45 remain.

As part of the effort to revitalize the old city and bring residents and businessmen back into it, the department invited entrepreneurs to make bids on managing the *hammam* once it was restored. The offer was taken up by a businessman who interestingly enough is named Sabah Hammami.

Another impressive restoration project under way is that of Maktab Anbar, a five-courtyard complex of three houses dating to the 19th century. It will open sometime in 1981 as an Arab Cultural Center for residents of the old city. Last, there is the Khan As'ad Pasha, an 18th-century As'ad a few meters south of the Hammam Nureddin.

"We took actual possession of this structure five years ago, but only last week were we able to dislodge the merchant who used it as a warehouse," Dr. Bahnassi said. "We hope to restore it as a handicrafts sales center and tea room."

"Above all," Dr. Bahnassi stated, "we don't want the old quarter to be restored as an empty showcase, but to make it a living city where visitors can witness and enjoy the life-styles of the past."

Pat McDonnell, who earned an M.A. in archeology at UCLA, broke an ankle during field work in Syria and subsequently stayed on to write and report on Syrian archeology.

IS IT EXTINCT? OR JUST HIDING?

THE CAMEL BIRD OF ARABIA

WRITTEN BY CAROLINE STONE ILLUSTRATED BY BRIAN SMITH

In February 1966, flood waters north of Ma'an, in Jordan, brought down into the Hasa Valley near Petra a single dying specimen of the species called *Struthio Camelus Syriacus* – the ostrich or, as the Chinese call it, the Camel Bird of Arabia. Since no ostriches had been seen on the Arabian Peninsula since 1941, the unexpected appearance of even one specimen gave hope to some optimists that these ostriches – which once roamed freely through Arabia – were not extinct but in hiding.

Ostriches were well known in the ancient world. The Egyptians, for example, took their feathers as the symbol of justice – because the vanes are exactly equal in width on either side of the shaft – and the Pharaohs were cooled with ostrich-feather fans; one fan with a handle made of gold was found in the tomb of an Egyptian queen of about 1700 B.C. And in Mesopotamia, ostriches, usually being sacrificed to the gods, were carved on seals. Mesopotamia also made ostrich eggs into cups, and eggs found in Etruscan graves, and in those at Mycenae, suggest that they were articles of trade in early times.

Many of the classical writers provided good descriptions of ostriches and their habits – indeed, it was Pliny, some 1,900 years ago, who first called them "camel birds" – and they seem to have cropped up in all sorts of ways. Apicius gives recipes in his cookery book for preparing ostriches and one emperor had himself drawn by an ostrich team in the hope it would look as if he were flying. Ostriches also made their appearance in the ampitheater, taking part in the games – not as odd as it sounds, since ostriches, kicking backwards, can bend an iron rail into a right angle.

Ostriches also appear frequently in Islamic verse and especially in the poetry from Arabia itself, where the birds were common. The pleasures of ostrich hunting, for example, were extolled, and large numbers of ostriches and eggs were considered an indication of prosperity.

In one of the great Arabic romances, "the Deeds of the Bani Hilal" – a story of the conquest of North Africa – one image describes Tripoli as a "city of merchants, proud and wary as the she-ostrich guarding her eggs."

Arab naturalists also focused on the ostrich – and often described it quite accurately. The following passage, for example, comes from Qazwini, whose *Cosmography,* written in the mid-13th century, includes a long section on birds:

> When the ostrich has laid her eggs, 20 in number or more, she buries them under the sand, leaving one third in one place, exposing another third to the sun, and hatching another third. When the chicks have come out, she breaks the hidden eggs and feeds her young with them. And when the chicks have grown strong, she breaks the last third on which vermin will collect, and this serves as food for the young until they are able to graze.

Not all writings on the ostrich were accurate. The belief that ostriches are bad parents, for example, probably goes back to Lamentations: " . . .the daughter of my people is become cruel, like the ostriches of the wilderness . . ." and to Job, where the ostrich "leaveth her eggs in the earth and warmeth them in dust and forgetteth that the foot may crush them or that the wild beast may break them. She is hardened against her young as though they were not hers . . ." And this is quite unfair. Ostriches, at least in the wild, are excellent parents, the female incubating the nest by day, the male by night.

A case recorded in the Nairobi National Park in 1960 illustrates this. A male ostrich was sitting on a clutch of 40 eggs, when he was driven off by a pride of lions. The cubs played with the eggs as if they were balls, dribbling them all over the surrounding area. When they had gone, the he-ostrich came back and laboriously succeeded in rolling the eggs back into the nest. Amazingly enough, they hatched.

Ostriches are the largest living bird and have existed in their present form for at least a million years, and though their origins have been much disputed, there is an Arab myth to explain why they cannot fly. Once upon a time, the falcon and the ostrich had a wager as to which could fly the best. The falcon said, "In the name of God!" and flew straight up towards heaven while the ostrich, who forgot to invoke his Creator's blessing, was scorched by the sun and fell to earth, never to fly again.

The present-day ostrich is two to three meters tall (seven to nine feet), weighs about 136 kilos (300 pounds), lives up to 70 years and has a number of physical peculiarities which set it apart from all other birds. The ostrich, for example, is the only bird that yawns, and, having an extraordinarily efficient heart, can run at 30 miles an hour for an hour at a time without showing distress, and can manage 40 miles an hour for 15 minutes.

Many of the popular stories about ostriches have an element of truth. They do swallow metal and stones – although not to the extent described by writers in the past – and the idea that they hide their heads in the sand to avoid being noticed isn't quite as silly as it sounds. Originating with the Arabs and passed on by the Romans, this legend is based on the fact that ostriches stretch their necks straight out on the ground to sleep and, when pursued, will suddenly throw themselves down flat, preferably with their head in a bush – to apparently vanish before reaching the horizon.

In the Arab world, the ostrich was hunted for pleasure. As a by-product of the sport, the feathers were used as decoration and the skins for cuirasses and the handles of knives. The skins are beautifully marked and very tough, although heavy, and now serve to make extremely elegant luggage. The eggs were sometimes blown and hung in churches, as ornaments where all kinds of legends came to be attached to them.

In early Islamic times, there was a lively trade in live ostriches. The Arabs, for example, sent them to China from Aden and Hormuz, and T'ang sources record that "the camel bird who inhabits Arabia is four feet and more in height, its feet resembling those of a camel; its neck is very strong, and men are able to ride on its back; the birds thus walk for five or six miles. Its eggs have the capacity of two pints."

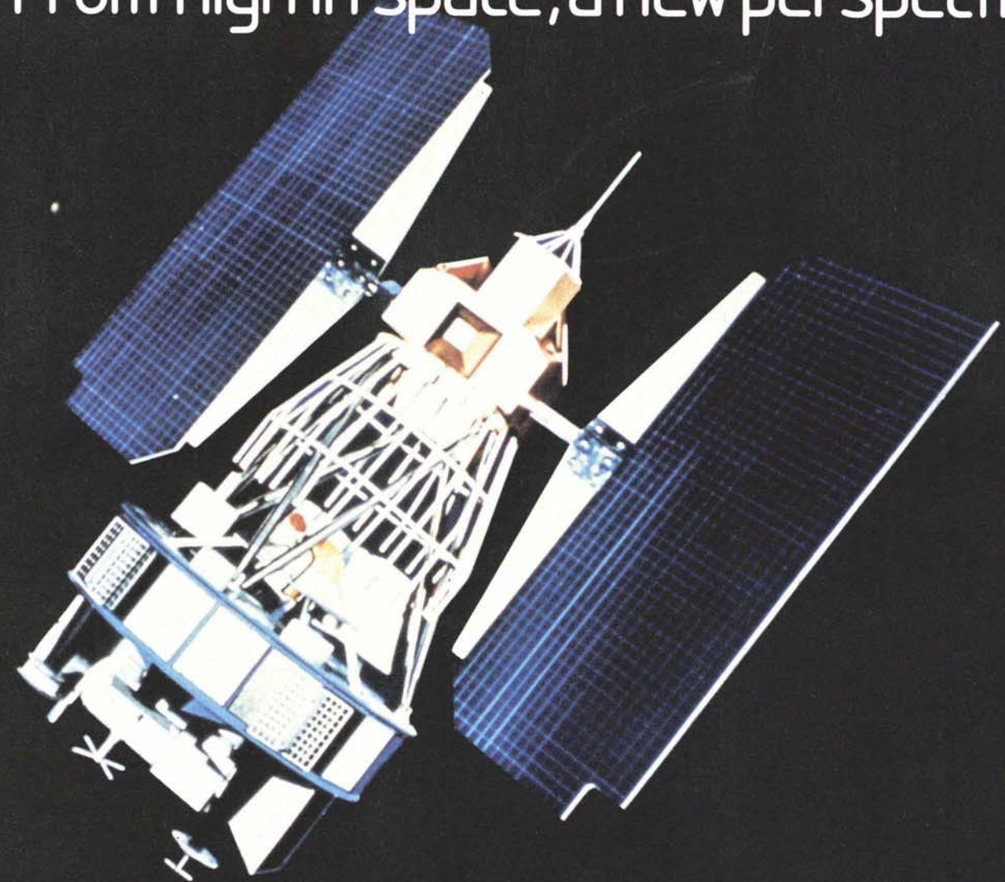
The ostrich had a much more serious role in Africa, since it was hunted not for sport but for food. The Kalahari bushmen were particularly adept at this – disguising themselves in ostrich skins in order to lure the birds into traps – and buried the eggs in the sand full of water, providing small reservoirs that permitted them to hunt far out in the desert. Women also used them as containers and would carry great grass nets full of them to and from the pools or springs. In the Kalahari and by the Orange River, rock carvings and paintings of unknown age have been found showing ostriches and the hunt. In other areas of Africa, such as the Sudan, ostriches were kept semi-domesticated as food and for their feathers, which in many regions were simply pulled out in handfuls at a time and sold as the owner of the bird needed cash.

Towards the end of the 19th century, ostriches became rare. This was partly because of changing patterns of agriculture and urbanization, and partly because of changing fashions. The demand by European women for feathers for hats and boas – exports from South Africa rose from about 9072 kilos (20,000 lbs) to nearly 453,590 kilos (one million lbs) in 50 years – might well have led to the ostrich becoming extinct. Fortunately, ostrich farming was introduced and proved successful all the way from Australia to Florida.

In Arabia, the introduction of firearms caused a great decline in the number of ostriches. On April 14, 1914, a British explorer, Captain William Shakespear, bought an ostrich chick when he was encamped near Jawf in today's Saudi Arabia, and about the same time a customs officer at the Allenby Bridge in the Jordan Valley reported that he had an ostrich that used to follow him about. But these were rare examples, and when, in the early 1920's, a hunter in Jordan discovered a clutch of ostrich eggs, they were rushed to England and incubated in the London Zoo. In 1941, though, the ostrich was declared extinct. Now, with the discovery of the ostrich near Ma'an, hope has revived that the Arabian ostrich may still be strutting about somewhere in the Middle East.

Caroline Stone writes regularly for Aramco World.

From high in space, a new perspective...



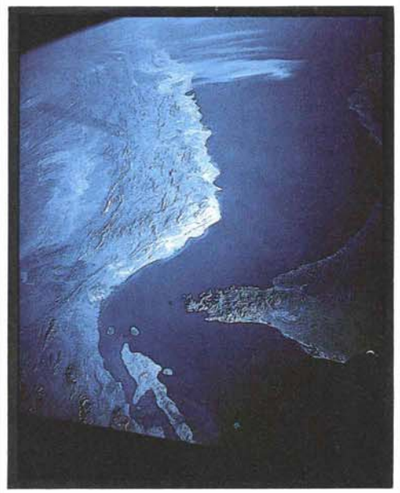
SATELLITES, SENSORS AND SAUDI ARABIA

SATELLITES, SENSORS AND SAUDI ARABIA

WRITTEN BY AULIS LIND

Nearly 10 years ago, NASA – the U.S. National Aeronautics and Space Administration – launched the first in a series of unmanned space satellites designed to study the surface of the earth by a process called "remote sensing" and to provide geographers, geologists, cartographers and other environmental specialists with a unique perspective on the earth's surface and resources.

Remote sensing – a term coined by a geographer in the office of U.S. Naval Research – means, in effect, the accumulation of information from a distance: spotting a sail on the horizon through a telescope or detecting the approach of bombers on radar.



A view of the Strait of Oman seen from the Northeast.

With regard to the unmanned satellite program – the LANDSAT program – remote sensing refers to the process by which highly sophisticated instruments called "multispectral scanners" record a unique kind of "image" of the earth's surface and, with the help of computers, extract invaluable information from the image about minerals, forests, agriculture, water, population and ecology on earth. So far the satellites have sent more than 300,000 "images".

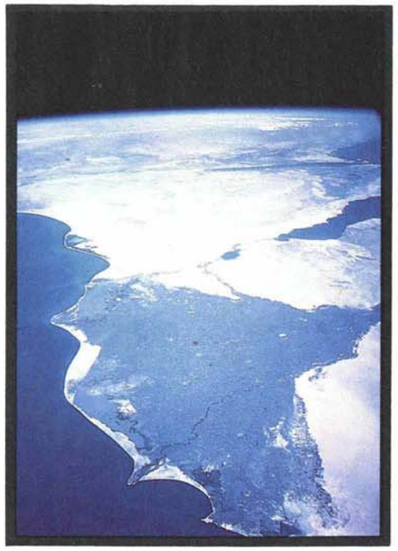
Illustrations courtesy of National Aeronautic and Space Administration (NASA) Environmental Research Institute of Michigan (ERIM), Centre National d'Etudes Spaciales (CNES), and Optionics International Co.

Like most of the great technological innovations, remote sensing is the end product of years of development, but it didn't really get underway until 1838 when Daguerre worked out a way to take a photograph on a silver-coated copper plate. This was the Daguerreotype, a cornerstone of photography. Its development thereafter, however, was swift, as imaginative applications spurred progress in photographic processes and related technology. Soon afterwards, for example, cameras mounted on kites and balloons were pressed into the service of topography in France, in exploration of the American West, in 1850, and in military observation during the Civil War.

Later, sensitized emulsions replaced Daguerre's cumbersome plates, and other improvements came, one after the other: multi-layered color film, motion pictures, haze penetration reconnaissance film, photogrammetry techniques and a multitude of lenses and electronic accessories. The most recent advance – which came in conjunction with the perfection of space launch techniques and the introduction of special satellites in the 1960s – is the use of "multispectral images" produced by "multispectral scanners."

Modern developments in remote sensing from space really started with the photographs taken from V-2 rockets sent up by American scientists in 1946, but the next important step was not taken until 1965 when the Gemini III crew brought back 25 color photographs of the earth, the first of 1,000 photos taken by 10 Gemini missions and two Apollo missions and evaluated as "acceptable earth-looking images." They were taken between March 23, 1965, and March 13, 1969.

Simultaneously, NASA experts were moving toward improved meteorological satellite systems – TIROS and NIMBUS – to provide images of cloud patterns and atmospheric phenomena; eventually they developed unmanned satellites specifically designed to collect surface data on a systematic basis: the LANDSAT satellites, a series of three satellites, the first of which went up in July, 1972, placed in orbits precisely calculated to provide the optimum



The Nile Delta photographed with a camera in space.

elevations for gathering and recording information about the earth's terrain.

Moving along near-polar, circular orbits at 24,000 miles an hour, 920 kilometers high (571 miles), these one-ton satellites take 103 minutes to orbit the earth – for a total of 14 orbits every day – and, since the satellites follow the sun, record images of specific locations at the same time every 18 days.

With regard to remote sensing, however, the satellite is just a platform. What is vital in the process is the sophisticated electronic sensor called the "multispectral scanner," the "eyes" of LANDSAT. The scanner measures the sunlight reflected off the earth's surface and can "see" further than the human eye in terms of scope. It picks up, for example, the reflected energy that the human eye can see, as well as other parts of the "electromagnetic spectrum." The solar part of this spectrum includes ranges of energy known as the "reflected" or "near infra-red" region – which lie *beyond* human vision.

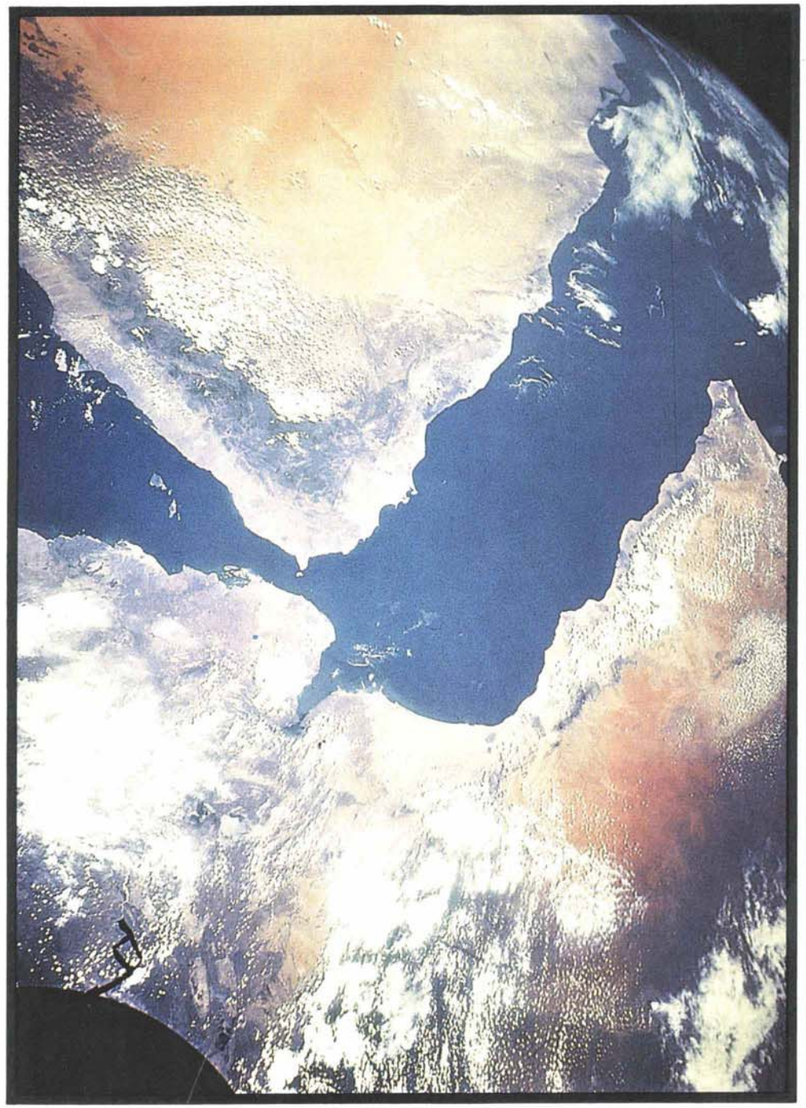
On the other hand, the scanner cannot quite cope with the color blue – and this creates a problem. Though energy from the sun is perceived by the human eye as white light, the light actually consists of colors that are dominated by blue, green and red hues, as experiments with a prism or the sight of a rainbow demonstrate. The atmosphere, however, tends to scatter the blues from the energy – thus creating the blue sky – and this, in remote sensing, is a problem: because the atmosphere would reflect a disproportionate amount of blue back to the sensor, the scanner would be unable to "see" the terrain clearly. Thus the blue band was not included in the design of the multispectral scanner.

Another problem has to do with the infra-red region – the invisible radiation of the sun which is reflected back to the satellite's "eyes." The infra-red bands – Infra-red 1 and Infra-red 2 – have no color and so cannot be photographically expressed in normal colors. But they do have interesting and important characteristics that are valuable in assessing the data that images from space can provide; vegetation, if healthy, tends to reflect the "invisible light" while water tends to absorb it. Indeed, if human eyes could see this reflection in terms of black and white, the green vegetation might appear white and the water might appear black.

What the LANDSAT analysts are left with, therefore, are four bands: normal red and green and two invisible infra-red bands, all translated into numerical degrees of brightness and then transmitted from the satellite to receiving stations on earth where LANDSAT specialists create an image that can be subsequently transferred to, and stored on, film at the ground processing center.

This is done by using a computer to sort out assigned digital numbers relating to variations in the reflected brightness of features – mountains, sea or desert – and then create an image from that information, a system that, in fact, is as interesting as the launch of the satellite itself.

Essentially, this is what happens: the numerical data – or data in digital form – are stored on what are called "computer compatible tapes" (CCT's) and the tapes are manipulated by the computer to "enhance" features of the "image." This is done in various ways by a "color additive system" resulting in images in which "false colors" are arbitrarily assigned to the various bands – and have nothing whatever to do with the real or visible color perceptible to the naked eye. Reds and pinks, for example, represent the infra-red energy bouncing off vegetation and growing crops; blues



The Arabian Peninsula looking to the northeast and showing, left, Ethiopia and Somalia, and right, the Gulf of Aden.

and greens represent urban areas, bare soil or plowed cropland; dark, uniform tones represent relatively clear water; light blues represent shallow water; dark, textured tones represent low-reflectance rocks; yellows and light tones often represent desert surfaces.

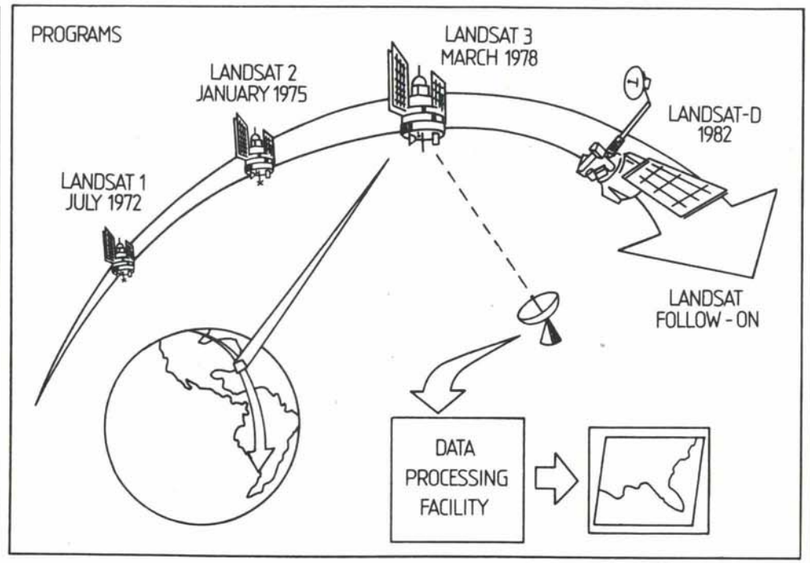
These variations in reflectivity – along with the individual characteristics of the scanner and the altitude of the orbit – also determine the amount of detail that can be seen on LANDSAT scenes. Each scene, for example, contains 7.6 million "pixels" – or picture elements – and covers a total of about 3.33 million hectares (8.2 million acres). And each picture element represents an "average" of the reflectance of all objects in the area covered in the scene. As a result, only the larger features of the terrain are seen; gullies, gardens, pathways, individual houses or dwellings, dispersed settlements, small streams and small roads cannot be discerned; but urban areas, agricultural fields, major rivers, geological structures, forests and major transportation arteries can be detected – and their situation interpreted with respect to other information within the scene.

In the future, earth-oriented

satellites and remote sensing systems will, undoubtedly, provide more detailed views of man's environment and will aid in improving his knowledge in various scientific fields. If, for example, the "pixel" size can be reduced – to say, 10 to 20 meters (32 to 64 feet) – the information in each scene will be substantially increased. Spectral expansion – via thermal infra-red channels that measure emitted infra-red energy from the earth – is also likely and would provide temperature information. Lastly, the LANDSAT program's fourth remote sensing satellite is expected to include a new system called a "thematic mapper."

Meanwhile, other countries are getting into remote sensing. In 1984, France will send up a system called SPOT, aboard an Ariane launch vehicle from French Guiana, to provide high quality, multispectral and panchromatic bands. And in Japan efforts are focused on the launch of MOS, another satellite with great potential.

Behind this surge of interest is the realization of the enormous benefits to be derived from space-imaging systems. Already, for example, ground stations in Brazil, Sweden, Italy, Japan, Argentina, Australia and India are receiving data that will eventually be invaluable in assessing mineral wealth, weather, the environment, and in

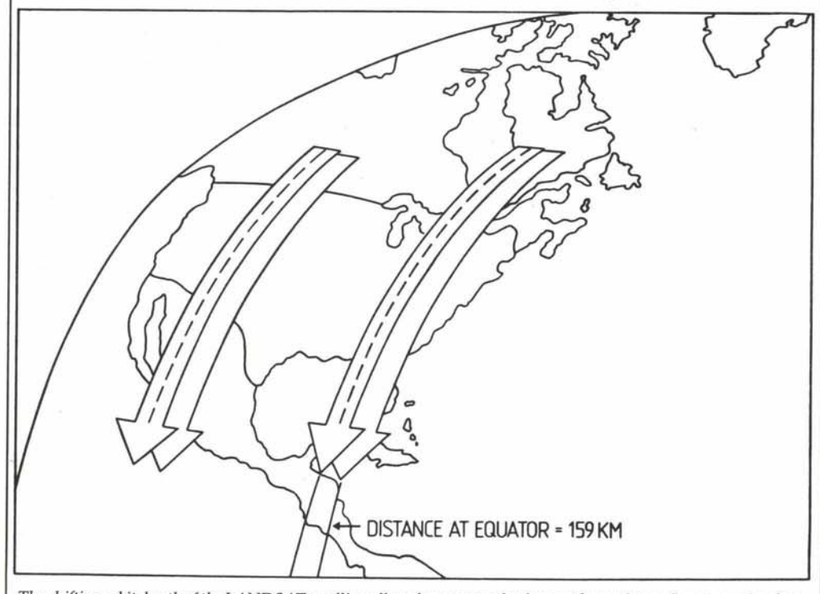


LANDSAT satellites scan the earth's surface and transmit to ground sensing stations data decoded into visual images.

planning – or controlling – urban growth.

In some areas, sensors and satellites have special value. Over regions such as the Netherlands or the British Isles, moisture and clouds interfere with remote sensing, but over arid lands – such as Egypt, the Arabian Peninsula and the Arabian Gulf countries – the imaging produced is extraordinary in terms of beauty.

Saudi Arabia, for example, though an exceptionally arid country, appears in LANDSAT images as a series of marked contrasts: the rugged, rocky area of Makkah (Mecca); the broken coast of the Red Sea running north to the Sinai and Suez; the interior region of plateaus and sand deserts; the extensive plains of the eastern region, monotonously flat and masked by sheets of sand and beds of clay and marl; and on the eastern edge a giant hidden basin which yields oil and gas; and, finally, the warm waters of the Arabian Gulf, with coral reefs beneath the surface.



The shifting orbital path of the LANDSAT satellites allow them to completely scan the earth's surface every nine days.

The imaging, however, is useful as well as beautiful. It helps in the search for water – the most critical resource for community and regional development in arid regions – as well as for minerals.

Characteristically, most water is found in aquifers in either porous sediments or greatly fractured bedrock. In the former – such as a sandstone bed – water is held as in a sponge, and in the latter, water is found in the cracks of otherwise dense rock. Geologic structures likely to yield water may be the fan of coarse sediments flanking mountain ranges – which reach to the clouds for their moisture – or highly fractured rock masses, as in the Makkah region shown on pages 18-19, and geohydrologists, from LANDSAT scenes, and such environmental indicators as vegetative growth – shown in red – plus traces of old stream channels can often pinpoint where test wells should be sunk.

The significance of this LANDSAT application is that aquifiers may be mapped on a national scale, thus providing the key to regional resource developments involving irrigation and water supply, the two most important water needs in the Middle East. Since LANDSAT scenes cover about 34,000 square kilometers (13,000 square miles), the regional magnitude of many geologic features can be more readily comprehended; aquifiers often extend over vast distances and neither ground views nor normal aerial photography, can fully encompass a geological unit of hydrologic significance or clearly evaluate its potential.

The same is true with regard to mineral resources, since geologic units of potential importance stretch for long distances. LANDSAT provides the broad view – the big picture – which is vital to recognizing and mapping potential sources. Indeed, the arid landscapes of the Middle East are often a geologist's paradise; since no vegetative cover masks the surface, basic bedrock characteristics can be seen where exposures are not covered over by shifting sands or water-deposited sediments. LANDSAT images, moreover, not only reveal regional characteristics, but also provide information about specific types of rock because of the different reflective properties of rocks which the satellite picks up as green, red and infra-red light. Unique combinations of these reflectances provide "signatures" which are then attributed to specific kinds of rock.

The formation of valuable metalliferous ores – such as copper – and precious minerals is often associated with ancient structural features subdued long ago by the ravages of erosion. Faults, or zones, along the boundaries of crustal movement are expressed as major lineations on LANDSAT scenes; with the broad view provided by LANDSAT, these features are readily traced – often beyond their previously known limits.

Mineralization may also be associated with intrusions of molten material into previously existing crustal material, the slow cooling beneath the surface bringing about crystallization – which subsequent erosion exposes. On LANDSAT scenes, these often appear as near-circular "anomalies" contrasting with the surrounding terrain and may be so large as to defy comprehension at ground or aircraft levels of observation.

Spectral (color) signatures of the bedrock, traces of faults and other geologic lineations – such as joints, structural trend lines and crust displacement – the presence or absence of vegetation and topographic features are all incorporated into the geologic analysis of LANDSAT data and geo-scientists must use them all to develop inventories and maps of the earth's resources.

In Saudi Arabia, such mapping programs have been underway since 1975. The Deputy Ministry for Mineral Resources, for example, has been operating a remote sensing applications facility since 1977, producing what are called "mosaics" from satellite-sensor images for use as base maps.

So far, three different series of these mosaic base maps have been started. Working with the U.S. Geological Survey and ERIM, the ministry has been working on 1:250,000-scale quadrangle maps and has recently completed a 1:2,000,000-scale mosaic of the entire peninsula composed of 256 images. Also finished is a 1:1,000,000,000-scale schematic soil map, the first ever attempt to produce a soil map for an entire country using LANDSAT data. And this year a 1:2,000,000-scale geographic map of the peninsula will be finished, possibly by this spring and will show topographical detail never represented on comparable maps before.

Sensor images have also been used to track the diffusion in the Red Sea of 15,000 tons of mud pumped from the sea bottom – and back – as part of a mineral extraction experiment.

In sum, sensors and satellites show Saudi Arabia and the whole Middle East more graphically, more beautifully – and more usefully – than any system ever has before.

Aulis Lind, now director of the University of Vermont Remote Sensing Laboratory, and associate professor, won her Ph.D in geography from the University of Wisconsin and for 15 years has worked with NASA, the U.S. Army and the University of Vermont interpreting digitalized satellite photos.

Images 1-2:
In the Hijaz

Though Saudi Arabia is climatically arid over nearly all its vast expanse – and thus provides detailed images – it is also a land of considerable contrasts, regional variations in geology and terrain as three LANDSAT scenes, computer enhanced and specially processed, show; **(1)** (see preceding page) The Red Sea coast (in the lower left corner); the harbor at Jiddah, gateway to Makkah, the Holy City of Islam; the coastal plain (Tihamat al-Hijaz); the Sarawat Mountains (dark tones); the plateau called Harrat Rahat, an extension of the interior Najd Plateau (light tones), covered with wind-blown sands (eastern quarter of image). Red tones are associated with high elevations in the mountains with extensive vegetation, a result of the heavy rainfall in this area (about 50 cm. of rainfall [20 inches] annually), and the urban areas of Jiddah, Makkah and Taif, the most densely populated region of Saudi Arabia. **(2)** An enlarged view with Makkah in the center near the white dot. Located on a rocky, hilly site, Makkah is surrounded by wadis coming from mountains to the east (the light-toned area to the east is Wadi 'Arafat and the gray lines represent the tent city for pilgrims). In wadis, the red tones show agricultural fields near rocky hills suited for limited grazing only.

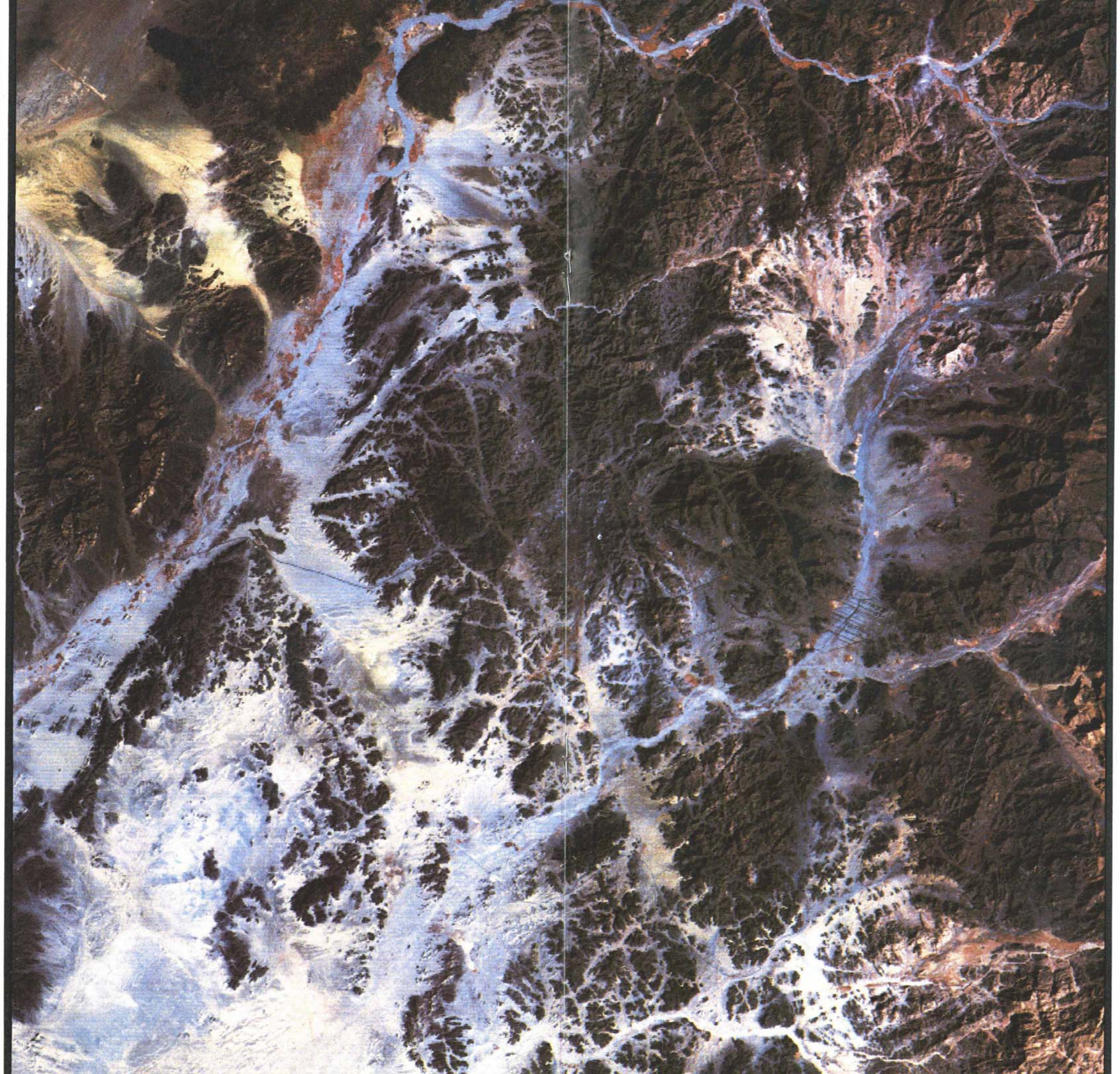


Image 3:
The Edge of the West

This scene includes the high mountains which stretch south from Makkah to the Yemeni border in the province of Najran and shows portions of the eastern flank of the Harrat and the rocky plateau of Najran. In the upper right hand third – the light-toned area **(1)** – are "stripes" of sand known as the Shuqqat Najran. To the left **(2)**, Wadi Najran, a dry stream bed, enters the interior sand dune area, where brilliant reds indicate irrigated agriculture. The town of Bir Khadra is at this site. Southward **(3)** is the al-Khadhra region, along the Yemeni border, and at upper left **(4)** Wadi Habawnah may be seen, the red tones again indicating vegetation-scattered patches of desert scrub and grasses.

The scene also discloses striations in the region's igneous-granite surface, similar to that near Makkah and characteristic of many granitic terrains. **(5)** Some of those lineations may in fact be faults – along which rock masses have actually shifted with respect to each other – but in any case, these are ancient rocks, extending back to geologic ages before life on earth. As to the dunes **(1)**, they are formed parallel to the prevailing northeasterly winds but the outflow from the wadis **(2)**

disrupts their advance, pushing them back with new sediments. For this reason, the dunes extend to the edge of the plateau only where there are no major wadis. The bluish tones in the "stripes" correspond to wadi deposits of gravel and coarse sand.

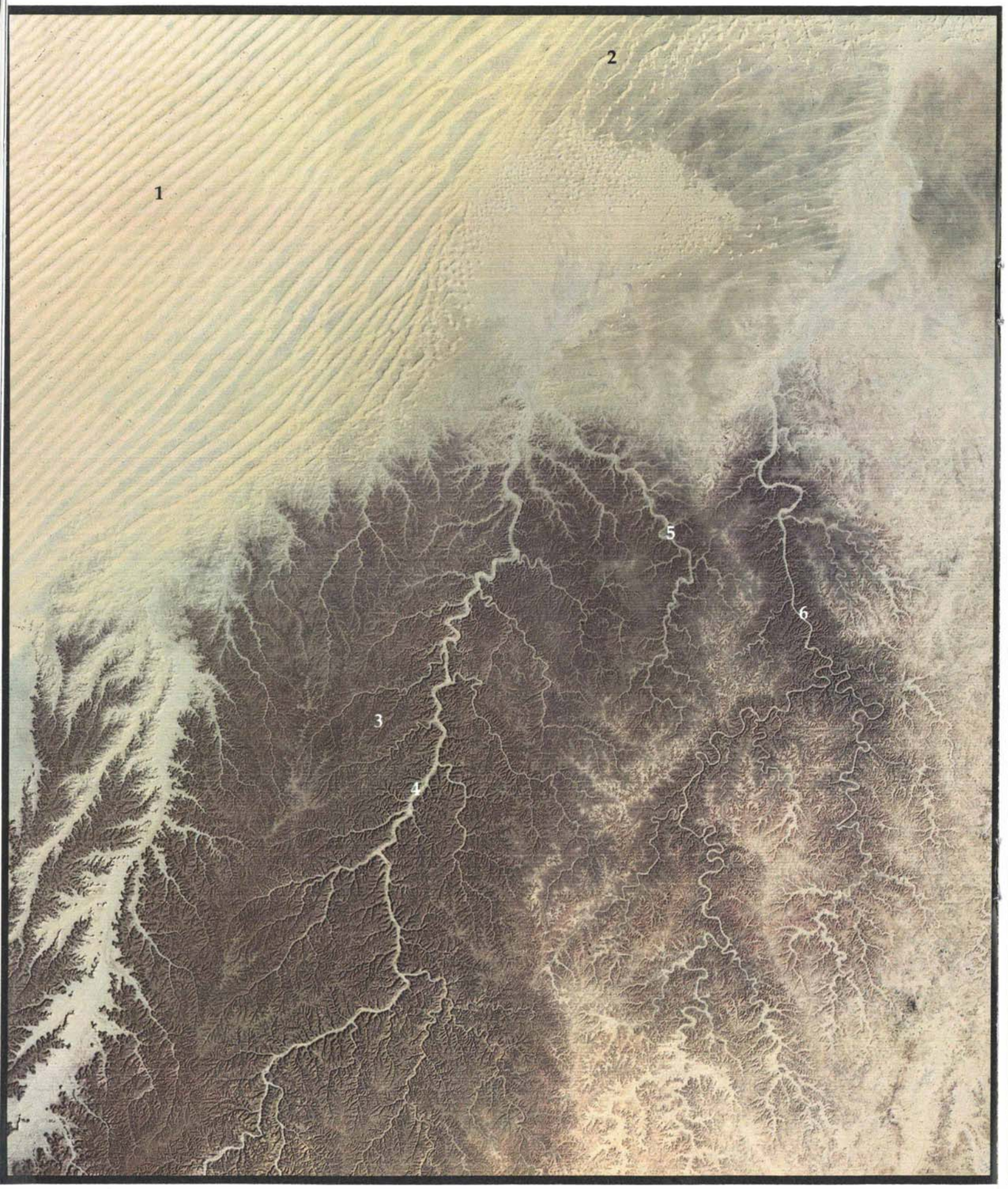


Image 4: Sand Seas, Remote Plateaus

In this LANDSAT scene, parts of the most remote areas of Saudi Arabia are dramatically disclosed: a rocky, dissected plateau and a portion of the vast sand sea called the Rub'al-Khali, or Empty Quarter. In the upper left (**1**) the dunes look like giant waves, a result of the prevailing northeasterly winds. These dunes are known to geomorphologists – land-form specialists – as longitudinal or seif dunes. The distance between dune ridges in this tract is about 3 kilometers (1.9 miles). Other dunes in the upper section of the image (**2**) are variations of barchen, or half-moon dunes, the long points downwind. Southwards (**3**), is the desolate plateau region, a maze of wadis and gullies with three large wadi systems draining northward, though their waters never reach the sea. They are, from west to east, Wadi Hazar (**4**), Wadi Khudrah (**5**) and Wadi Qinab (**6**).

The resemblance to trees is the result of stream action, which produces what is called a "dendritic" or branching pattern, and suggests horizontally bedded sequences of sedimentary rocks. The large number of stream courses also suggests that the rock is weak and tonal variations resemble contour lines showing elevations. Faint pink tones suggest a trace of vegetation though this is an extremely arid region. At (**4**) the scene also shows how eroded soil and rock are deposited on the adjacent plain as the water loses momentum in the absorbent desert surface under the influence of high evaporation rates; near Wadi Khudrah, the deposit, resembling a fan, suggests disruption in the dune pattern and indicates that the wadi system discharges there occasionally.

This single scene shows how valuable terrain information can be assembled – information needed to develop resources still uncovered. Potable water, for example, is of paramount importance in Saudi Arabia and this image suggests that a potential source may be pinpointed at the location of the fan and along the margins of the plateau where wadis emerge.

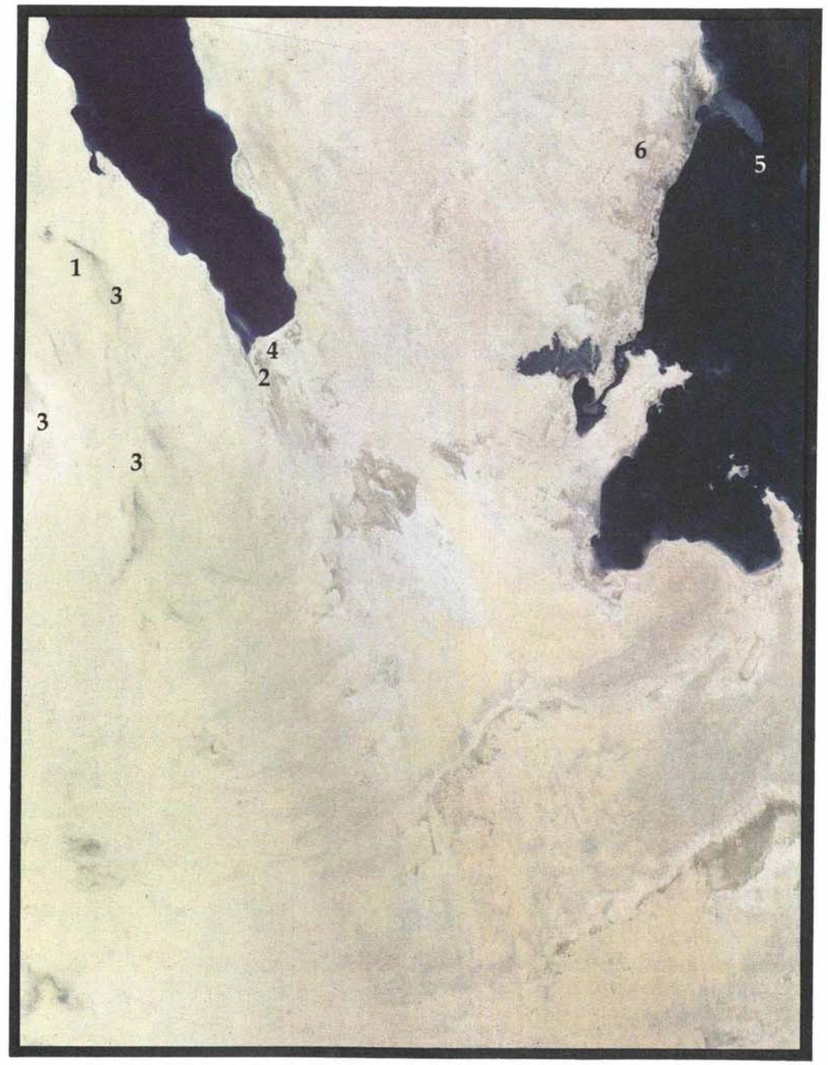


Image 5: Oil Beneath the Sands

This view shows the vast desert plain called the Rub'al-Khali and the al-Hasa region (**1**), a sizeable tract in the northwest, the upper left section of this scene. Monotonously flat, and generally not higher than 300 meters (980 feet) above sea level, this region, during various ages of geologic time, accumulated vast oil deposits.

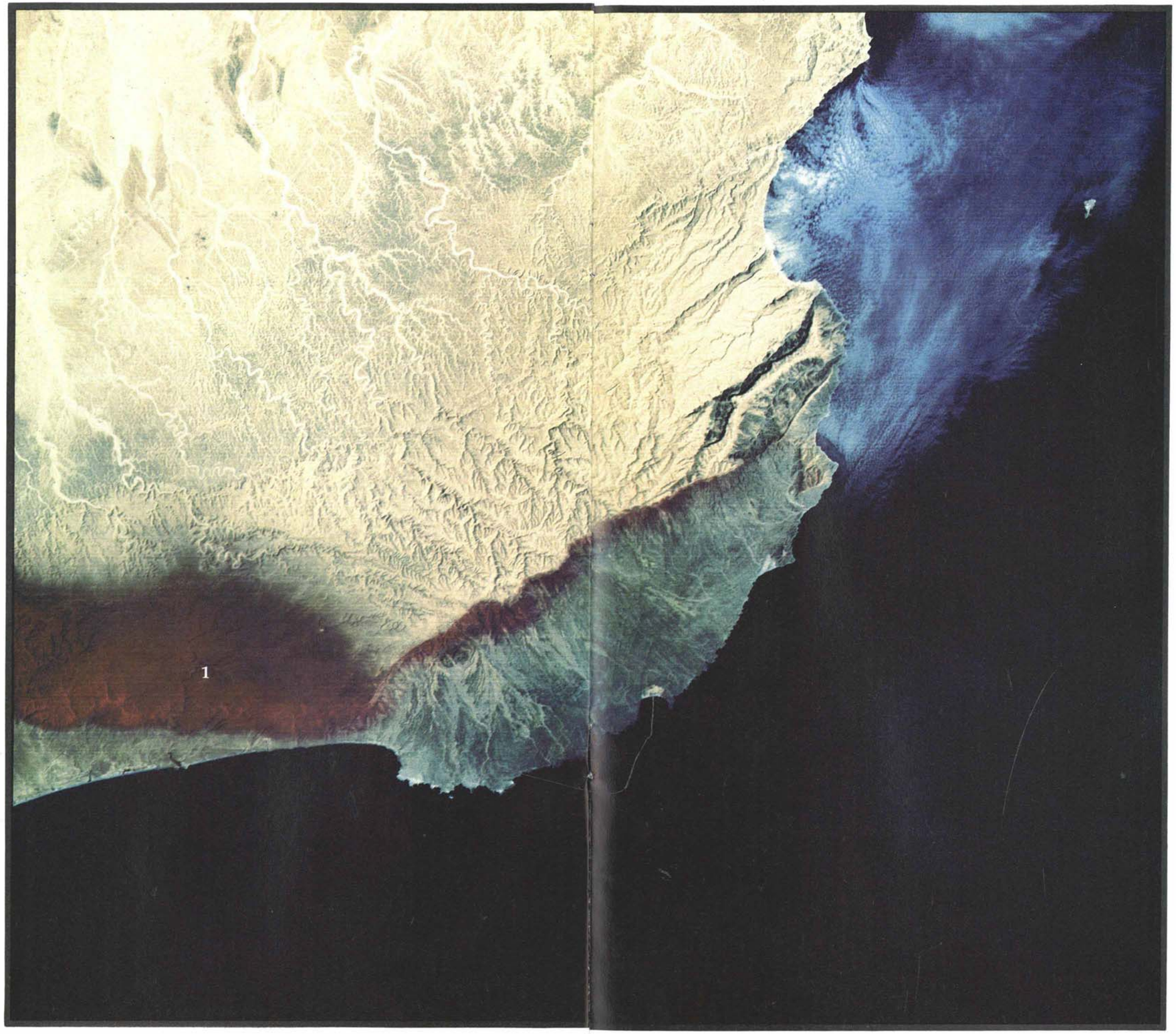
In this scene, subtle color differences represent clays, marls, sand and gravel beds deposited mainly by the sea over the past few million years and the faint pink tones on the image south of the arm of the Gulf of Bahrain (**2**) indicate desert scrub, just about the only vegetation that can exist in this very arid region, which absorbs rainfall so fast that there is no surface runoff and thus no wadis. In some places (**3**), plumes of smoke signal the effects of man's activity, and also point to oil fields being developed. The only sizeable settlement in the scene, however, is the town of Salwah (**4**) at the head of the Gulf of Bahrain (Salwah Bay). The image also shows coral reefs in the Gulf (**5**) and coastal dunes may be seen along the east coast of Qatar (**6**) along with evidence of coastal scrub vegetation.

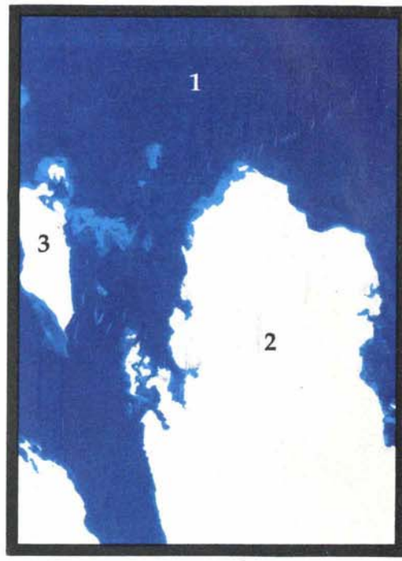
Images 6 & 7: Along the Coasts

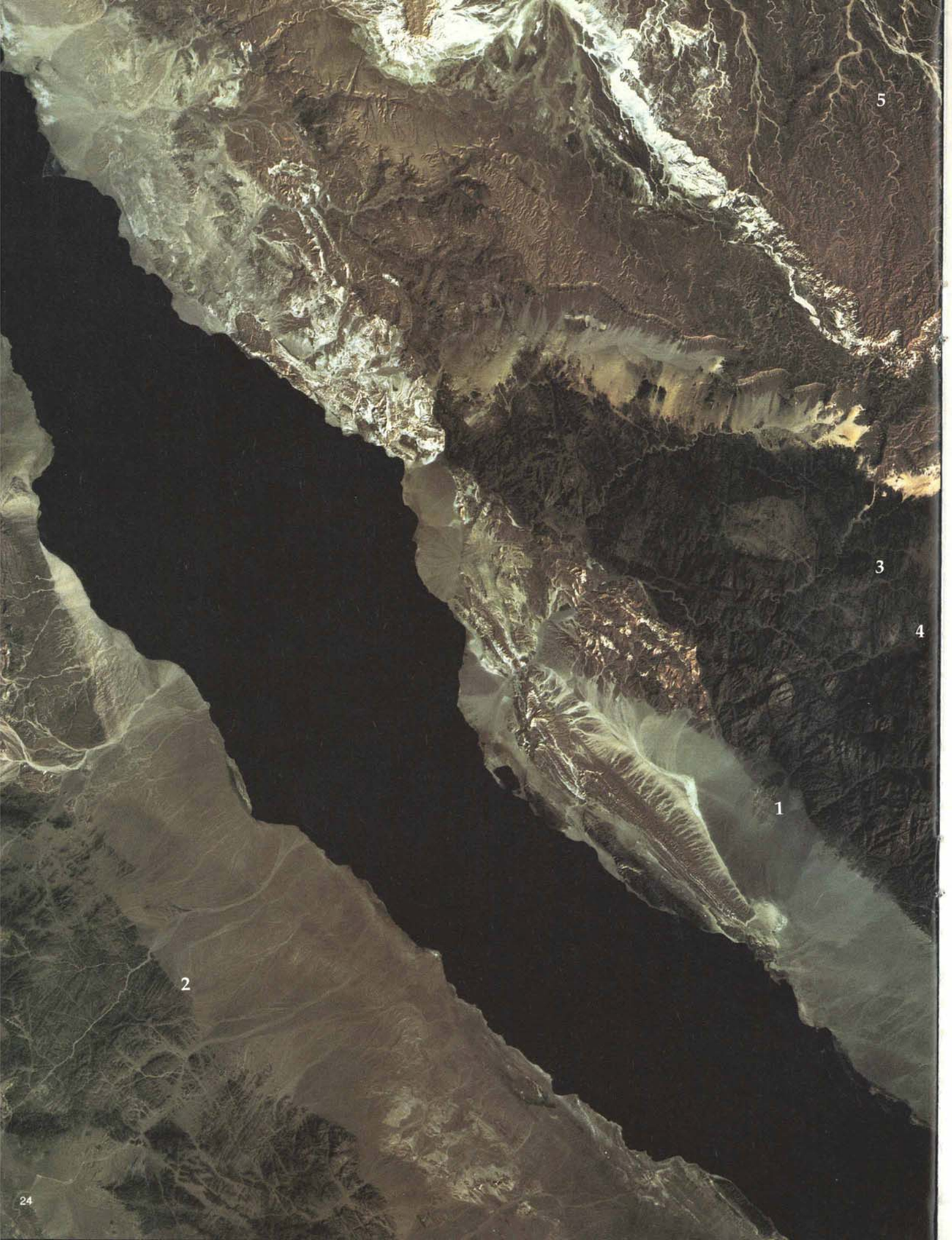
In these color composite LANDSAT scenes, sensors in the satellite show, far right, the coast of Oman, and, in deep blue, the Arabian Gulf (**1**), the Qatar Peninsula (**2**), the island kingdom of Bahrain (**3**), and, in a variety of blue hues, shoals and coral reefs in the Gulf.This image also shows how the highly reflective desert surface, contrasting with the Gulf, clearly delineates the shape of the coast.

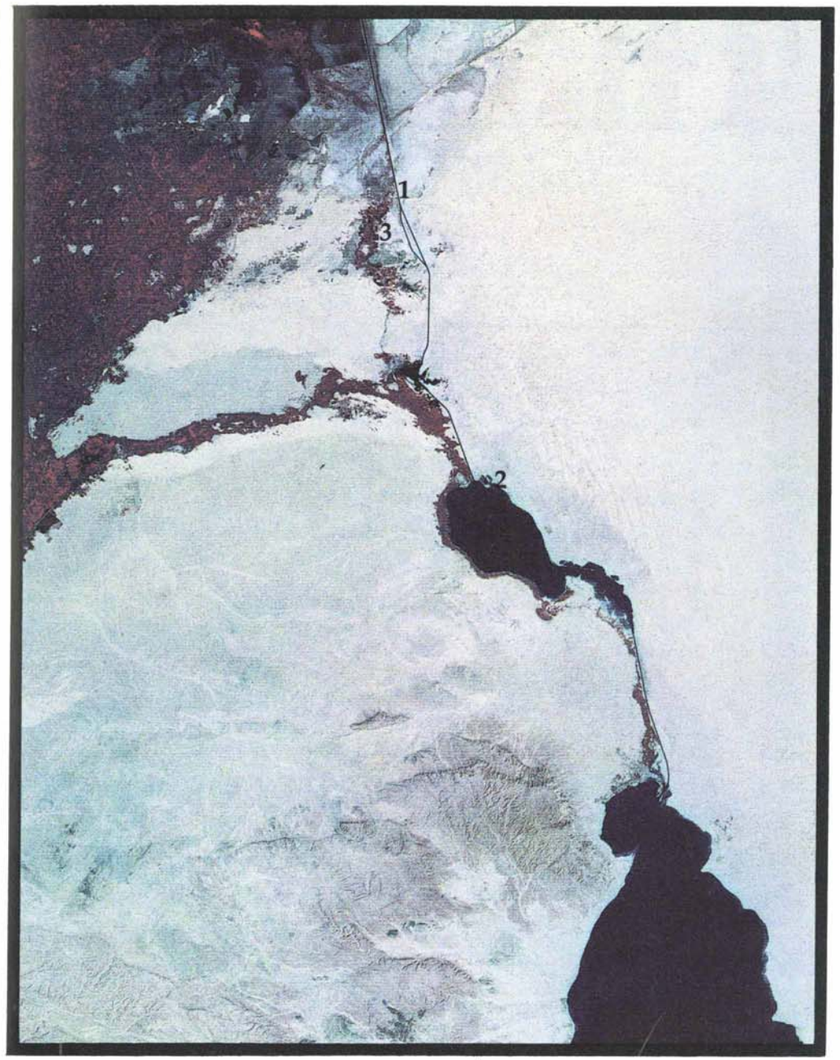
Imaging here also demonstrates the highly reflective principles of remote sensing. Because sunlight streaming into the ocean "extinguishes" itself as depth increases, depth can be detected – by measuring the visible light returning to the sensors in the satellite, but not the infra-red bands, since, as noted, infra-red radiation from the sun is almost entirely absorbed by water. By processing the picture elements in the visible green and red bands – in a computer – and correlating these with water depth measurements at sample points, invaluable charts and maps from this image may be generated; corresponding to this image and color-coded, they show depth as measured in fathoms. This is achieved by using an additional computer processing step by which the scene and water depth classification is superimposed onto a hydrographic chart – important information in an area with the heavy volume of oil tanker traffic that the Gulf has.

At right, the color composite of Oman shows the importance of coastal mountains as moisture "traps." South of the Jabal Qard, the mountains (**1**) in reddish hues are a coastal lowland and the coastal town of Salalah, with vegetation irrigated by the water flowing out of the mountains. Also shown are the extensive wadis extending into the Empty Quarter and, because of a tilted plateau surface, flowing northward, a few kilometers from the coast. Because these coastal mountains rise more than 1,000 meters above sea level (3,280 feet), they receive moisture and in discharging it become in effect giant oases, in which agricultural activity and settlements can exist.









Images 8 & 9: The Red Sea – and North

From its new port at Yanbu, Saudi Arabia, in 1982, will begin to ship petroleum to the western world via the Red Sea, the Suez Canal and the Mediterranean, all shown in Image 9, above. Another composite, this image shows the western half of the Sinai Peninsula (right half), the strategic Suez Canal (dark north-south line) connecting the Red Sea via the Gulf of Suez with the Mediterranean (near image center), the northern extent of the Red Sea Hills in the region known as the Eastern Desert (west of the canal and the Gulf of Suez), and – along the left margin – the Nile Valley and delta, its luxuriant vegetative growth, principally crops, fed by the waters of the Nile, lined in dark red. Also shown are the waters of the Nile, spreading through the delta in canals: the Ismailia Canal (**1**) reaching from the Nile eastward toward Lake Timsah (**2**), shown here as a deep red pathway in the desert, and the city of El Qantara (**3**). The dark lines extending eastward from El Qantara are the transportation arteries into Sinai. Port Said is just off the scene at the northern terminus of the Suez Canal. In Image 8, opposite, sophisticated computer processing by Optronics International of Chelmsford, Massachusetts, adds sparkle and detail to a drab Gulf of Suez landscape by a technique known as "linear stretch." In effect, the picture elements (pixels) comprising this scene are assigned new values that "stretch" the originally acquired range of tonal values into a broader range of tones which bring out details too close in tone to be detected and recognized in routine processing. As a result, this image shows geological details of the Gulf of Suez which, like the Red Sea, represents a rift in the earth's continental plates due to divergent motion in the plates. At (**1**) and (**2**) for example, the image shows how blocks of the crust have dropped downward – below sea level in the case of the Red Sea region – in response to the pulling apart action of the African and Arabian plates; the sharp tonal boundaries on either side of the Gulf are escarpments which appear to represent the faults or breaks in the crust, and outline the area that has dropped downward to form the Gulf of Suez. This large regional scene also makes it possible to identify types of geologic formations or rock types; the darker toned area (**3**), for example, is similar to the region around Makkah, and definite lineations in the rock mass (**4**) are probably ancient faults or joint patterns. These areas are geologically important since mineralization is common along such zones and they consequently lead the geologists to potential sources of valuable minerals. Also important are sedimentary rocks which surround the darker mass, which are tilted slightly – or nearly horizontal – and which show branching (**5**) drainage patterns that guide image analysts to formations. The drainage patterns shown were possibly created as long ago as the Pleistocene Ice Age. The light, smooth tones bordering the Gulf of Suez largely represent water deposited material – sands and gravels – and though now barren may have unknown potential. Such areas demonstrate the value of the LANDSAT program since satellites and sensors alone can pinpoint this potential for future evaluation and exploration.

The King's Dictionary

WRITTEN BY BARRY HOBERMAN MANUSCRIPT PHOTOGRAPHS COURTESY OF PETER GOLDEN

What does a king do in his spare time? Sultan al-Afdal al-Abbas, who ruled Yemen from 1363 until his death in 1377, seems to have enjoyed many of the leisure activities commonly favored by medieval Muslim kings and princes: falconry and archery; horsemanship and swordmanship; and, like many Islamic sovereigns, literary and scholarly pursuits. Well-versed in a broad spectrum of religious and secular disciplines, he wrote on such topics as eminent personages in Yemenite history, the genealogies of the Arabs and the cultivation of grains and cereals.

Nothing unusual there; in medieval Islamic countries we would expect a learned man to have an interest in such subjects. But in the early 1970's, historians were stunned to discover that this scholarly monarch had been responsible for yet another work: a spectacular polyglot dictionary, in which he listed about 1,200 Arabic words and then, alongside, in parallel columns, supplied their equivalents in five other languages: Persian, Turkish, Greek, Armenian and Mongolian.

This was unusual. Though multi-language dictionaries were widely circulated throughout the Muslim world in the Middle Ages, most were lists of Arabic, Persian and Turkish words – a total of three. Never before had a dictionary involving *six* languages been found.

Such vocabulary lists, obviously, would have been of use to merchants and diplomats – not to mention those in intelligence work – yet al-Afdal's dictionary, apparently, was compiled with no immediate utilitarian aim in mind. Commercial terms are conspicuously absent, and the king's choice of languages, categories and words makes it highly doubtful that he gave any thought to the linguistic needs of diplomats, military men, civil servants or spies. To the contrary, all the evidence leads to the refreshing conclusion that the dictionary was compiled strictly as an intellectual pastime – a scholarly hobby. Al-Afdal al-Abbas, the sixth Rasulid sultan of Yemen (the Rasulid dynasty ruled Yemen from 1229 to 1454), apparently collected words in other languages the way some people collect stamps, coins and butterflies – for fun.

The "Rasulid Hexaglot" – as the dictionary has been dubbed by researchers – is one of a group of works by al-Afdal that were discovered in Yemen; the works were bound together to form a single manuscript. In 1974, a Lebanese scholar showed a microfilm copy of this manuscript to Professor Tibor Halasi-Kun, an expert in Turkic languages and history in the Department of Middle Eastern Languages and Cultures at Columbia University.

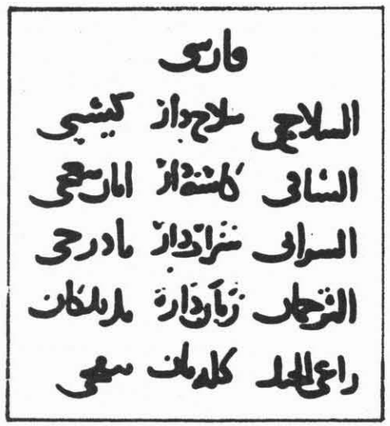
Immediately recognizing the historical value of the unique six-language dictionary, Halasi-Kun obtained a microfilm of that particular portion of the manuscript – the manuscript itself has never left the Yemen Arab Republic – and set about assembling a team of scholars to edit, translate and analyze the text of the dictionary. This is more difficult than it sounds because the text is written entirely in Arabic script (used but rarely to transcribe the Greek, Armenian, and Mongolian languages) and presents a number of paleographical, philological and historical problems.

That team, consisting of four internationally respected philologists, two in the United States and two in Hungary, is still at work on the dictionary, but hopes to publish its results in book form in the near future. Halasi-Kun is working on the Turkish section and his former student, Professor Peter B. Golden, currently associate professor of history at Rutgers University's Newark campus, is responsible for the Greek. Working together, Halasi-Kun and Golden are also translating the Arabic and Persian entries, which are linguistically far less difficult than the others. The Mongolian portion is being studied by Academician Lajos Ligeti of the University of Budapest, while his Hungarian colleague, Professor Edmond Schütz, is handling the Armenian.

The whole tale has a wonderfully cosmopolitan flavor to it: a Yemenite king; Lebanese, American and Hungarian scholars; texts in Arabic, Persian, Turkish, Greek, Armenian and Mongolian. In a sense, though, it reflects medieval Yemen itself. Situated at the southern end of the Red Sea astride ancient maritime trade routes, Yemen had a long history of commercial relations with, to name a few, Egypt, Ethiopia, the Arabian Gulf countries, even India and Ceylon, and in its rulers and peoples, was multi-ethnic.

Prior to its takeover by the Rasulids, Yemen had been ruled by the Ayyubids, the dynastic house to which the great Saladin belonged, and then in 1239, after the Ayyubids lost their foothold, by the Rasulids. Of Turkic origin, either Turkomans or Turkmens, the Rasulids' present-day homeland in Central Asia is one of the 15 constituent republics of the Soviet Union. Among Yemen's ethnic

groupings there were also Arabs, Kurds, and Turks, along with a sizeable Jewish population, a fair number of Persians and a smattering of Greeks, Armenians, Georgians and Circassians. The dictionary, then, should be viewed not only as the handiwork of a distinctly intellectual monarch, but also as the product of an exceptionally international milieu.



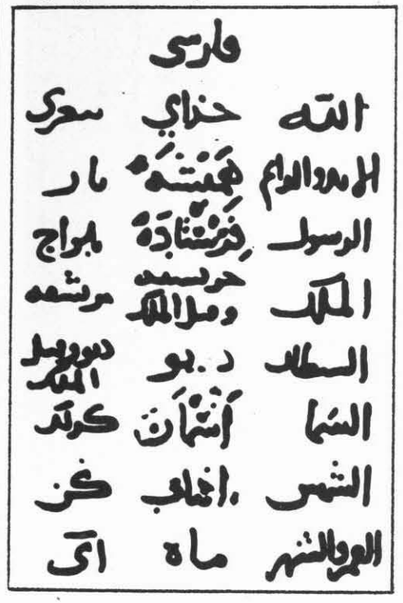
In his office on the Newark campus, Professor Golden enthusiastically discussed the dictionary and its 14th-century compiler. At 40, the cigar-puffing Golden is by far the youngest member of the team that will publish the manuscript, but he has already carved out a formidable reputation as a historian and philologist. For his doctoral dissertation on the Khazars – who inhabited the lower Don-Volga region, north of the Caucasus Mountains, and were one of the most important Turkic peoples of the Middle Ages – Golden studied medieval texts written in Arabic, Persian, Russian, Greek, Hebrew, Armenian and Georgian. He has contributed articles to the *Encyclopaedia of Islam* and the forthcoming *Cambridge History of Inner Asia,* and his future plans include research on the nomadic Cuman, or Kipchak, Turks of the Black Sea steppe in the Middle Ages, and on medieval Georgian chronicles dealing with the Mongol conquests. During the past seven years he has familiarized himself with all the columns in the Hexaglot, including those (Turkish, Armenian, Mongolian) for which he is not formally responsible.

"I think it is purely a scholarly hobby," said Golden when asked about al-Afdal's reason for compiling the dictionary. "Here is a very cultured, very learned gentleman, this Yemenite king. He is simply putting together a kind of *vocabularium* of what for him were the politically and culturally significant languages of the area of the world that was of interest to him, which means basically the eastern Mediterranean . . . He is talking about what were the great languages of this era, in essence."

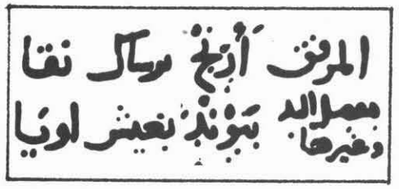
To Golden, the sultan's dictionary is an impressive achievement, though in fact medieval rulers with academic tastes are nothing out of the ordinary. Ulugh-beg, grandson of Tamerlane, who governed Samarkand and its environs from 1409 to 1446, was an outstanding astronomer-mathematician, and many other kings and princes found periodic respite from their official duties and obligations by engaging in the study of history or literature. But, says Golden, al-Afdal al-Abbas's passion for lexicography – dictionary-making – though splendidly offbeat, is not what makes this Yemenite sultan so special. "The interest *is* unusual – but the guy was *good!*" declared Golden.

When work on the dictionary began, however, it was not at all obvious that al-Afdal had been a good scholar, because the Rasulid Hexaglot manuscript is not written in the king's own hand, but is a scribal copy i.e. a copy of a copy of a copy of a copy of . . . etc. The team assumed automatically that variations in spelling were scribal errors.

The assumption was logical. Like modern typesetters, copyists almost invariably introduced some errors, and the likelihood of error, naturally, would have increased whenever a scribe was required to copy data in a language that he did not know – especially in uncommon languages like Mongolian and Armenian.



Under such circumstances, it's easy to make a spelling mistake – and much harder to catch it afterwards, even when proofreading the manuscript. The team, therefore, frequently thought that the spelling of various words had been garbled during the copying of the dictionary. As Professor Golden said, "When you work with these things – and you're dealing with a copy – there is a tendency to sometimes see yourself as a little bit cleverer than the copyist. You say, 'Well, it's obvious he made a mistake here.'



"Now sometimes, indeed, it *was* the copyist's error. But, nine times out of 10, when the copyist was being faithful to the original and we had doubts about the genuineness of the given form of a word – our doubts proved to be completely unfounded. The king was a first-rate philologist, with a fantastic ear, and if he says something is pronounced this way, *believe it.* Because if we would search around, we would find the evidence that this isn't any aberration on his part; it's a bona fide form."

The Arabic and Persian columns of the Hexaglot appear to be typical examples of the written Arabic and Persian of the late Middle Ages, but each of the other languages in the dictionary exhibits features which invite special comment. For instance, the Turkish words in the latter part of the dictionary, beginning with folio 7 (there are 10 folios in all), come from a dialect that is closely related to the kinds of Turkish spoken in modern Turkey, Azerbaijan and Soviet Turkmenistan, whereas the Turkish of the beginning section displays affinities with the group of Turkic languages that includes, among others, Tatar, Bashkir, Kazakh, and Karakalpak, all of which are presently spoken in the Soviet Union. This discontinuity is the tip-off – though there are other hints – that the Rasulid Hexaglot may, in fact, consist of two separate dictionaries which have been spliced together to form a single whole. In the Greek and Armenian portions, there are a number of common characteristics; both languages, for example, are written in Arabic script, a rare find. (The best-known example of Greek in Arabic script is a series of poems by the 13th century mystic, Jalal al-Din Rumi.)

What is most interesting about the Greek and Armenian entries is that in both cases they bear witness to now-extinct *spoken* dialects of the Middle Ages. Like Arabic today, medieval Greek and Armenian each had a standard written form that adhered closely to classical models, so that two Byzantine historians living in separate provinces of the Byzantine empire and speaking distinctly different dialects of Greek would use much the same literary language in composing their respective histories. But the spellings that al-Afdal gives for Greek and Armenian words suggest strongly that he had heard those words pronounced by native speakers, rather than relying on written texts.

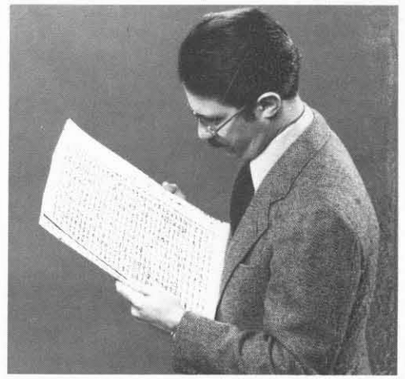
Furthermore, the Greek in the Hexaglot, which constitutes one of the few surviving records of a spoken Byzantine dialect, provides scholars with long sought-after clues concerning the evolution of modern Greek. Professor Golden believes that the particular dialect represented in the dictionary is Cypriot, or else is from the western coast of Asia Minor. Similarly, the Armenian found in the Hexaglot is clearly distinguishable from the usual literary Armenian of the late Middle Ages. Moreover, the dialect recorded apparently was not spoken in the Armenian motherland in Transcaucasia, but stems instead from the medieval Armenian kingdom in Cilicia along the coast of what is today southeastern Turkey. Cilician Armenia fell to the Mamluks during the lifetime of al-Afdal al-Abbas, but it *had* played a pivotal role in the history of both the Crusades and the Mongol conquests. It was logical, therefore, that the Yemenite king considered Cilician Armenian to be one of "the great languages of this era," to use Professor Golden's expression.

From the standpoint of philological scholarship, the Mongolian section of the dictionary is the most valuable column of all. Though Mongol rule in the Near East, which extended over Iran and Iraq and was centered in Persian Azerbaijan, lasted from 1256 to about 1335, all of the surviving literary works are in Persian, Arabic or Syriac. And though there was never any doubt among scholars that Mongolian was spoken in this part of the Islamic world for at least a few decades, little was known about the dialect until the discovery of the Rasulid Hexaglot.

As yet, it has not been definitely established whether al-Afdal used written sources alone in compiling this column of his dictionary, or whether, 30 or 40 years after the Mongols had ceased to rule in the Near East, he was able to find someone in Yemen who still spoke Mongolian. Either way, the king's curiosity about the language of Genghis Khan is a stroke of luck for modern specialists, who will profit immensely from his diligent labors.

The vocabulary items in the Hexaglot are grouped systematically according to subject. Professor Golden called the classification scheme "very, very scholarly and internally logical." Included among the many categories are the following: anatomy, bodily functions, beasts of burden, fur-bearing animals, insects, birds, kinship terms, parts of the day/week/year, numerals, weights and measures, currency, bodies of water, topography, trees, fruits, grains and cereals, colors, illnesses and afflictions, horses, household implements and tools, weapons, archery equipment, horse paraphernalia, assorted foods, clothing, precious metals and gems, crafts and craftsmen.

Indeed the Hexaglot research team has been overwhelmed by the orderly method followed by al-Afdal. "Since all of us are philologists by training," Golden pointed out, "we go through it and say, 'By God, that's the way to do it!' I mean, if I were doing something like that I might want to arrange it in this way. In a sense, we almost felt this king was a kind of a kindred spirit. He was interested in a number of things we're interested in."



Professor Peter Golden examines the Rasulid Hexaglot.

The dictionary's detailed listings in such subject areas as falconry, archery and horsemanship indicate that these interests were especially dear to the king's heart. For example, he gives the Arabic, Persian, Turkish, Greek, and Armenian words (no Mongolian column is supplied here) for arrow, bow, quiver, bowstring, feather of an arrow, arrowhead and target. We also learn that a white-gray falcon is called *al-baz al-ashhab* in Arabic, *baz-i saped* in Persian, *aq toghan* in Turkish, *aspron yerakin* in Greek, and *spidak baza* in Armenian.

As expected, the most fundamental terms were included in the Hexaglot: God, man, woman, living, dead, earth, sun, moon, friend, enemy, bread, meat, milk, head, heart, Paradise, Hell. But it's the linguistic oddities that have delighted the scholars translating the dictionary. And so we also encounter listings for cottage cheese, gnats, pasta, raincoat, shoemaker's awl, louse, and second stomach of a camel. Professor Golden's favorite entry is the Arabic *al-'ukna,* meaning "a single fold of skin across the abdomen, caused by fat." The only other language of the six in which a single word denotes the same concept is Turkish. In the Persian, Greek and Armenian columns, the king was forced to insert two-word expressions meaning "fold of the belly" (the Mongolian is absent). A good lexicographer has to make do with what's available, of course.

The question remains – what does the Rasulid Hexaglot tell us about life in Yemen in the 14th century? The honest answer is, not a great deal. Instead, it tells us about the interests and concerns of a talented Yemenite king, and, in doing so, prodigiously enhances our knowledge of late medieval Turkic, Cilician Armenian, late Byzantine Greek, and an extinct Mongolian dialect of western Asia.

Yet the Hexaglot also raises as many questions about al-Afdal as it answers. What was he like as a person? When and how did he become interested in the world of words? Did he have friends with whom he could share his deep interest in the subject? And did he feel regret when the performance of kingly tasks kept him from his beloved research and writing for days or weeks at a stretch?

About these things and many others we can only wonder. Perhaps it is enough, though, that we have his dictionary – a gift to posterity. And the careful preparation that has gone into the forthcoming edition and translation of the Rasulid Hexaglot ensures that it will be a publication meeting the highest standards of scholarship – a publication in the tradition of al-Afdal al-Abbas.

Barry Hoberman free-lances from Somerville, Mass. and contributes frequently to Aramco World.

THE MARSH ARABS REVISITED

WRITTEN AND PHOTOGRAPHED BY MICHAEL SPENCER

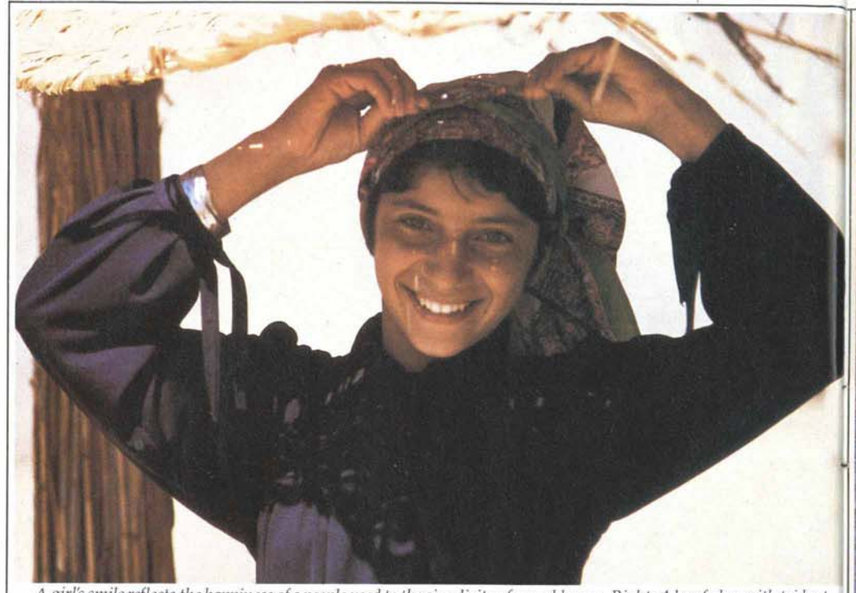
THE MARSH ARABS REVISITED

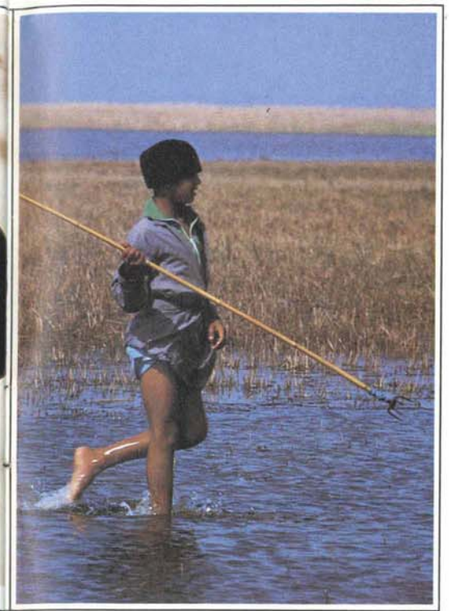
In 1951 — just 30 years ago — explorer Wilfred Thesiger (See Aramco World, *July-August, 1981) entered Iraq's 6,000 square miles of canals and reedbeds known as the Marshes, and later, in* The Marsh Arabs, *presented another of his evocative descriptions of one of the world's wildernesses.*

Memories of that first visit, he wrote "... have never left me: firelight on a half-turned face, the crying of geese ... canoes moving in procession down a waterway, the setting sun seen crimson through the smoke of burning reedbeds, narrow waterways that wound still deeper into the Marshes ... reed houses built upon water, black dripping buffaloes ... stars reflected in dark water, the croaking of frogs ... the stillness of a world that never knew an engine ..."

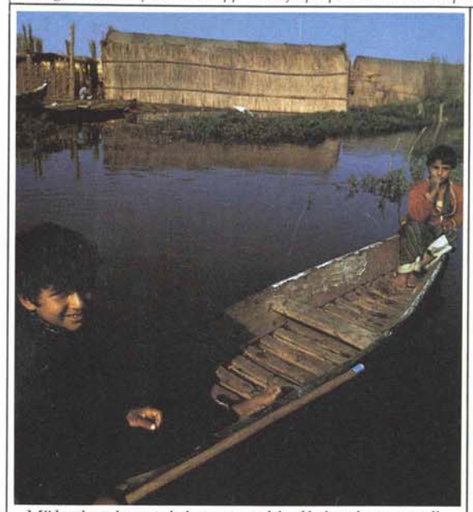
To Thesiger, life among the Marsh Arabs today would still be familiar. But to a man passionately opposed to what is called progress, it would also come as a dreadful shock — as Michael Spencer suggests in this article written after his first visit to the Marshes last year.

– The Editors –

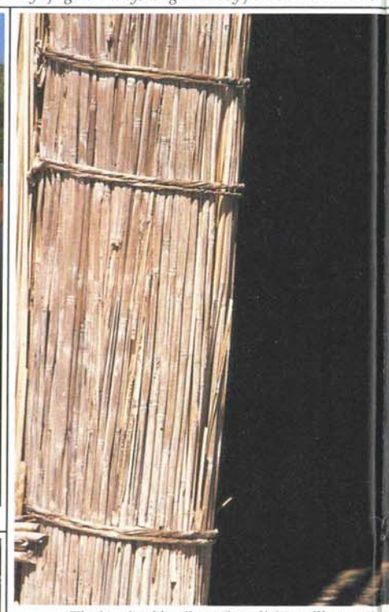




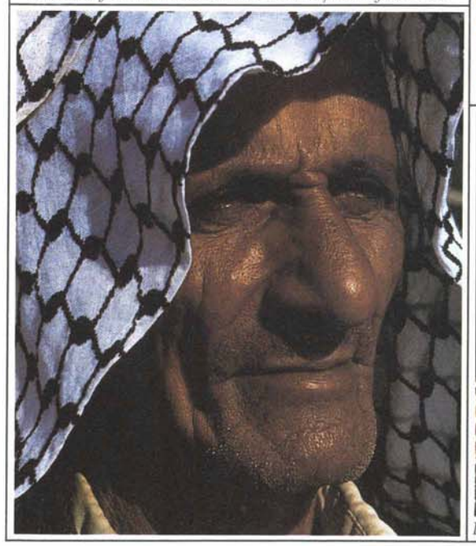
A girl's smile reflects the happiness of a people used to the simplicity of age-old ways. Right: A boy fishes with trident.

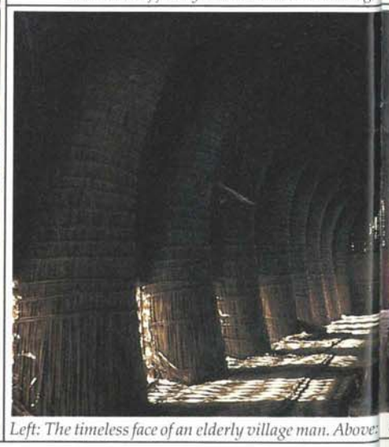


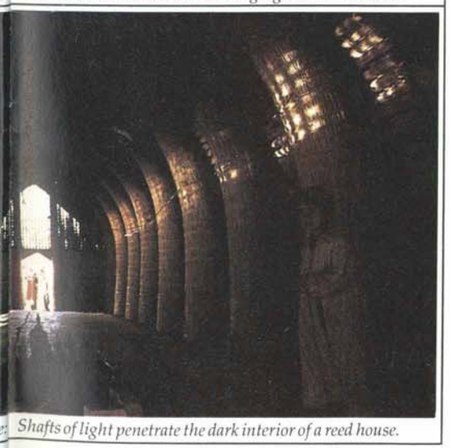
Mi'dan *boys learn to balance a* mushhuf *before they can walk.*



The bonds of family and tradition still strong, these children live in a world changing slower than most.







Left: The timeless face of an elderly village man. Above: Shafts of light penetrate the dark interior of a reed house.

During my first visit to the Marshes, Ali, my boatman, and I were invited to stop in a *mudhif,* or guest house, in Grimsley, a village named after a British consul stationed nearby when Iraq was a League of Nations member. I asked for a drink of water. Surely, said our host and went off to get it.

It was, I thought dreamily, just the way Thesiger had described it: a barrel vaulted reed house, buffalo splashing and snorting in the still, clear water, two cloaked women poling their *mushhuf* between the reed houses and, the final touch, the rhythmic beat of pestle and mortar as someone pounded fresh coffee beans. ...

But then my host returned and handed me a glass of cold, icy water. *"Shukran?,"* I murmured – and paused. Cold? Icy? In the Marshes? I looked at the glass. Yes, indeed. Ice cubes.

By then Abu Kdir was grinning. "Come and see," he said and led me to the adjoining house, explaining that these days, with his son earning good wages in Basra, well. ...

I was not listening, however. I was staring, perplexed, at a cable pushed incongruously through the reed matting and, plugged into it, not only a refrigerator, but a TV set. Obviously the Marshes of Iraq had changed since Thesiger's day.

These changes, as Thesiger's book shows, are recent. With access always difficult, the Marsh peoples were able to preserve, until the 1950's, isolation and a unique way of life that, in some respects, goes back 7,000 years. In later, turbulent times, the Marshes also provided a place of refuge – and, sometimes, of rebellion. One example is the Chaldeans who defeated the Assyrian king, Sargon, in the seventh century B.C. Another is the Zanj. A rebellious army of slaves that challenged and nearly upset the ninth-century Abbasid Caliphate, the Zanj had their stronghold in the Marshes, and even the mighty Ottoman Empire never quite succeeded in its attempt to control the area.

Situated in southern Iraq, the Marshes straddle the lower reaches of the Tigris and Euphrates rivers and their confluence: the waterway called the Shatt al-' Arab. Although exact figures are difficult to obtain, they once covered an area of perhaps 15,540 square kilometers (6,000 square miles) in a rough triangle formed by the towns of Amara and Nasiriya and the city of Basra.

Today, though, this area is shrinking as dams and irrigation projects further upstream siphon off a vast volume of water and, as a result, lower the river's level.

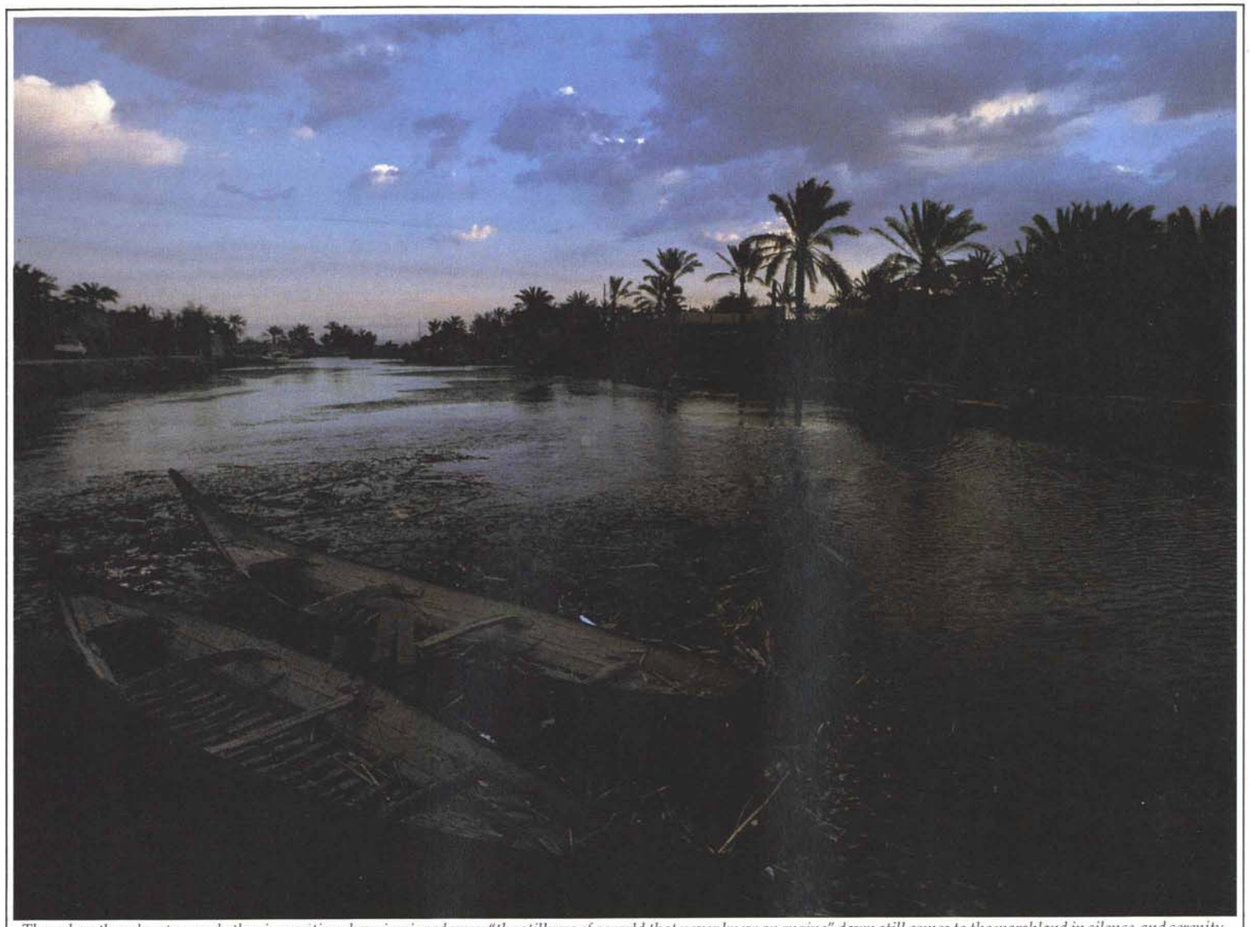
Nevertheless, the Marsh is still lovely. Some parts are permanent marsh, others seasonal – flooded only in spring and summer – but all, in flood, a maze of channels and waterways, many made by driving buffalo through the reedbeds when the water is low. There are also lakes large enough to lose sight of land on, and areas in which the reeds are so thick and high that it is impossible to see more than a few yards ahead. Villages dot the marshes in clusters of anything from half a dozen to 200 dwellings, and wildlife – especially birds – is plentiful.

The Marsh Arabs call themselves *Mi'dan,* a collective word for the various tribes and clans that live in this waterlogged area. With periodic additions from the multitude of civilizations that held sway in Iraq's stormy past, they are not an ethnically distinct people. They are, moreover, often scorned by townspeople as primitive and backward, and they, in turn, regard city dwellers as unscrupulous money-grabbers who have forgotten the rules of hospitality and good manners. They proudly insist that *their* customs and culture are truly Arab, and that the challenge of the marsh life sets them apart.

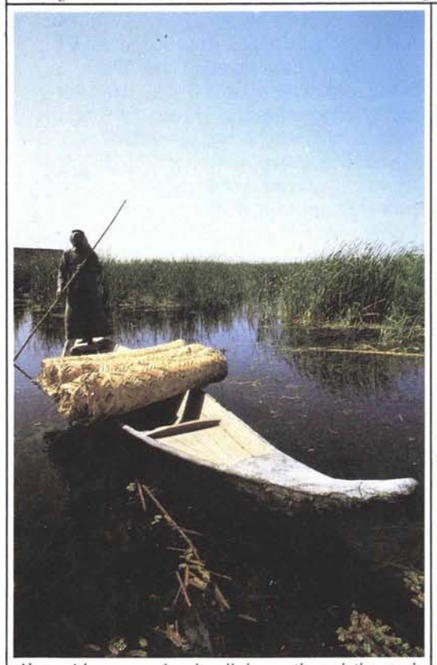
In the past, the *Mi'dan* grew rice, wheat and barley in the seasonal marshland, but this is not common any more. Indeed, I saw sacks of flour and rice from Texas being sold in the village stores. The basic diet still consists of rice, bread, fish and buffalo milk, but, today, substitutes and new delicacies are readily accepted. *Mi'dan* tribesmen still tend water buffalo and will probably continue to do so for the foreseeable future; to the *Mi'dan* this is a labor of love. On the other hand it is still labor: hours must be spent each day cutting the thin, green reeds that are the buffalo's chief fodder.

Another important part of their economy is fishing. Scorning nets, the *Mi'dan* fish skilfully with long, wood-shafted tridents, an energetic activity that involves exhaustive runs through sometimes waist-deep water for hundreds of yards in what often proves to be a fruitless – or rather fishless – chase.

One day, for instance, I went fishing with Salim and Ahmed, two young *Mi'dan*



Though outboard motors, and other innovations have impinged upon "the stillness of a world that never knew an engine," dawn still comes to the marshland in silence and serenity.



Above: A lone man poles a bundled cargo through the marsh.

Right: A group of water buffalo forage among the reedbeds.

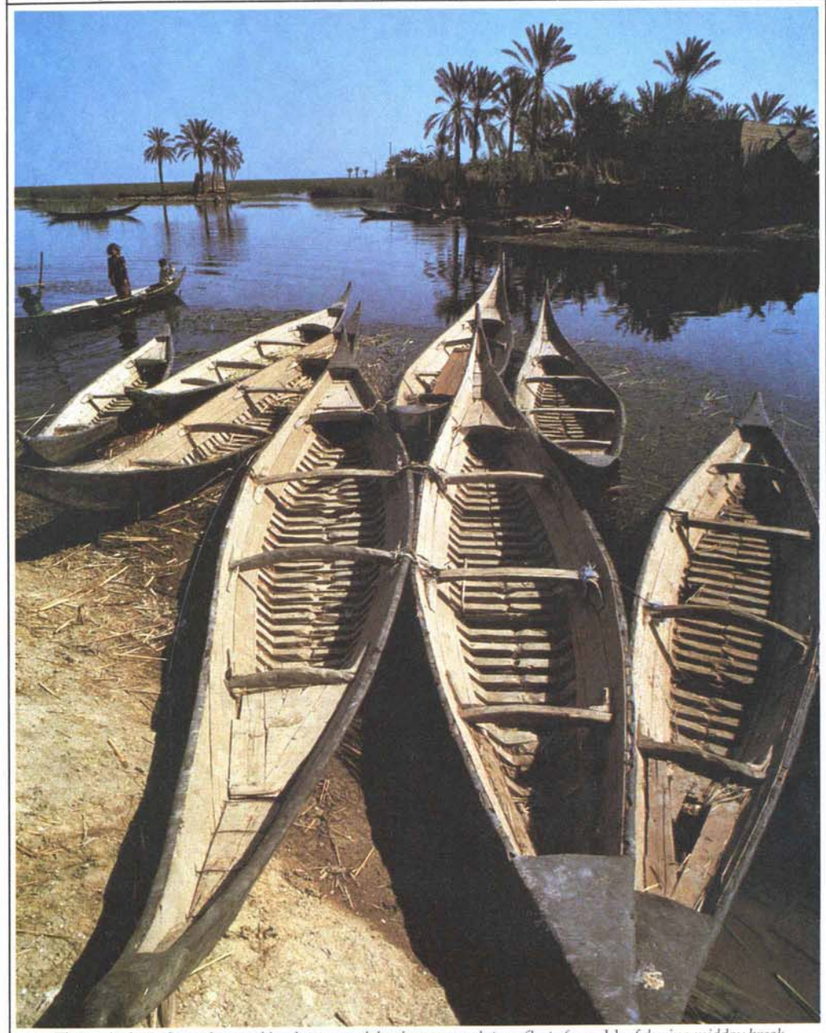
boys with small but athletic bodies and strong, white teeth that flashed when they smiled. We paddled to a place where the water was low and trapped in long pools reflecting the powder-blue sky and the soft greens and golds of the reeds fringing the edges, and they waded in looking for fish that had been trapped in the pools by the receding water. Laughing at their near-misses and shouting encouragement, I watched them spend the entire afternoon in pursuit of the elusive fish, but when the sun began to tinge the water red and orange, they had only three small carp between them.

The *Mi'dan,* of course, do not live in tents but in the intricately designed and well-constructed reed houses that are the pride of the Marsh Arab. These structures differ in shape and size, according to their purpose, but the most striking of the designs is that of the *mudhif,* or guest house, built only by prominent members of the village as a place where travelers and visitors can rest, eat and refresh themselves while they exchange the latest news and gossip. By chance, I went to one village – Dibin – just as a family was building a *mudhif* to replace their old one.

Years before, the foundations of the *mudhif* had been laid by fencing off an area of marsh and filling it in with reeds and mud until the surface was above water and dry – an "island". Subsequently, if the water level rose, more reeds were added to the surface and some of the older islands protrude about two meters (six feet) above the water. Construction, therefore, began by wedging the thick, six meter *qasab* reed (20 feet) into the surface of the island, the first step in making columns of these reeds; the next is to bundle them together in taut "cables" and bend them into arches.

The work is strenuous and the humidity, that warm spring day, made their faces glow with small beads of perspiration. Every half hour, in fact, the men had to stop for rest, innumerable cups of coffee or tea, and cigarettes. After several days though, the *mudhif* began to take shape: 11 arches curving gracefully over an area five meters (16 feet) high and 15 meters (50 feet) long. Next, the workmen, crouched on scaffolding also made of the reed bundles, attached mats, woven of fine reeds by the women and children, to the exterior of the frame and at each end, built arched doorways supported by twin pillars. Finally, inside, they spread mats and cushions on the floor, leaving an open patch of dry mud in the center as a fire-place, and the *mudhif*

From the qasab *reed, which is bundled and flexed to form sturdy arches, the* Mi'dan *build their ingenious dwellings.*



The equivalent of an urban parking lot, a marsh bank accommodates a fleet of mushhuf *during midday break.*

was complete. I felt privileged to be among the first guests.

In *The Marsh Arabs,* Thesiger compared the *mudhis* to Romanesque or Gothic cathedrals, an impression, he said, "enhanced by the ribbed roof and the traceried windows at either end, through which bright shafts of light came to penetrate the gloom of the interior." I agree. But then I agree with almost everything Thesiger said about the Marsh Arabs.

In fact, I think it the definitive work on these unique people and I carried a copy with me on my visits to the marshes, where it excited great interest among the villagers when, poring with delight over the photographs, they recognized places and objects familiar to them. One photograph of a naked boy fishing always gathered a crowd, though most assured me, "We don't dress like that any more."

This is true. Among the changes that have occurred is a less casual approach to dress.

There are, in fact, remote parts of the Marshes where very little has changed since Thesiger lived there and glumly predicted that the life-style of the *Mi'dan* as he saw it could not last much more than 20 years and certainly not 50 years. Indeed, the *Mi'dan* have proven more resistant to the insistent forces of technology than Thesiger expected, though telephone and electricity poles snaking their way through the water are no longer a rare sight and both television aerials and outboard motors are becoming more common.

Another change – a result of a government decision to promote the welfare of the *Mi'dan* – is the introduction of schools and medical services.

Significantly, more young *Mi'dan* are leaving the area to work or to further their education in the towns; few are expected to return to the lives their fathers led. These trends are, no doubt, irreversible – a universal adjunct to development in rural communities – yet the bonds of family and tradition, stronger among the *Mi'dan* than elsewhere, help the Marsh Arabs maintain their customs and way of life and have definitely slowed the pace of change. For instance, while outboard motors are regularly used on the main channels between villages, they seldom seem to disturb the tranquillity of the villages themselves, paternal authority remains unchallenged even when children exceed their parents in earning power.

Furthermore, many who leave the area will long to return, for the Marshes have a beauty that is not easily found elsewhere in Iraq. Despite the extremes of climate – winter temperatures below freezing, sweltering summers with days of 50 degrees Centigrade (120 degrees F) not uncommon – the Marshes have a magic that is hard to forget. In spring, the waters are high and fresh from the thaw in the north and the green reeds, pushing through the golden stubble of the old, are vibrant with new life. The colors are muted and soft, with the occasional pink-and-blue surprises of water lilies in bloom. Pelicans waddle in flotillas through water so clear that you can see carp and catfish feeding among plants on the bottom, while flamingoes and giant heron wheel in the warm, scented air and the only noise is the splash of your paddle and the hoarse croaking of frogs in the reedbeds.

On the other hand, the Marshes are shrinking. Villages that, 10 years ago, were surrounded by water now sit like beached

Arab craftsmen lay the poplar slats of a mushhuf.

shipwrecks in a sea of dry land. Because arable land is scarce in Iraq, drainage schemes, aiming at the fertile soil under the water, have begun to bite into the marshland. The village of Huwair, for example, once sat on an island in the Marsh, but today the land around the village is given over to regular agriculture, and the lovely reed houses have given way to brick ones.

Fortunately, the village still has access to the Marshes; in the high water season a creek and flooded pathways between the columns of the date palm plantations lead to the Marshes.

This access is important because Huwair is a major boat building center for the Marshes, and it was there that I spent some days watching the craftsmen fashion the *mushhufs* and the larger, high-powered *taradas.*

The boats are built in workshops under reed awnings with a minimum of tools: a hammer, a saw, a bow drill and an adze. No measuring instruments are used, the craftsmen relying on eyesight alone for lengths and angles. In the first stage, the outline of the bottom of the boat is fixed on the ground in string. Then transverse slats – of Euphrates poplar – and a center beam are shaped to fit the design, and the hull is built up with thin planks.

Finally, the boat is waterproofed with tar from troughs in among the boatsheds, steaming over low fires and filling the air with a smell reminiscent of fresh-laid roads; the tar is applied by dipping two rolling pins in the trough and smoothing the substance over the hull of the boat, giving it a distinctive black hue.

The result – the *mushhuf* is a craft ideally suited to marsh travel, having a very small shallow draft. It is difficult for a novice such as myself to keep his balance in a *mushhuf,* but the *Mi'dan,* who play in the *mushhufs* before they can walk, move around the boats with the easy grace of tightrope walkers.

My visit to the Marshes ended on an afternoon in late March, when I had to go to Basra and take the train back to Baghdad. The sky had become prematurely dark and a warm breeze was gathering momentum, dragging a veil of dust and sand with it into the thickening air; the first of the summer dust storms, it bent the palms as easily as reeds, and a weak sun cast a primeval light.

As we drove along the levee that served as a road I saw a small *Mi'dan* village huddled tight against the wind, bathed in the unearthly light of the storm. It was an ancient scene, awesome and disquieting: man struggling with the merciless forces of nature that sought to snatch away his shelter – and perhaps his life. And though I knew that the *Mi'dan* would survive that storm, I also knew that when the dust cleared, the 20th century would still be there, an inexorable threat to the grand simplicity of their rather special lives.

Michael Spencer is a free-lance writer-photographer, based in London.