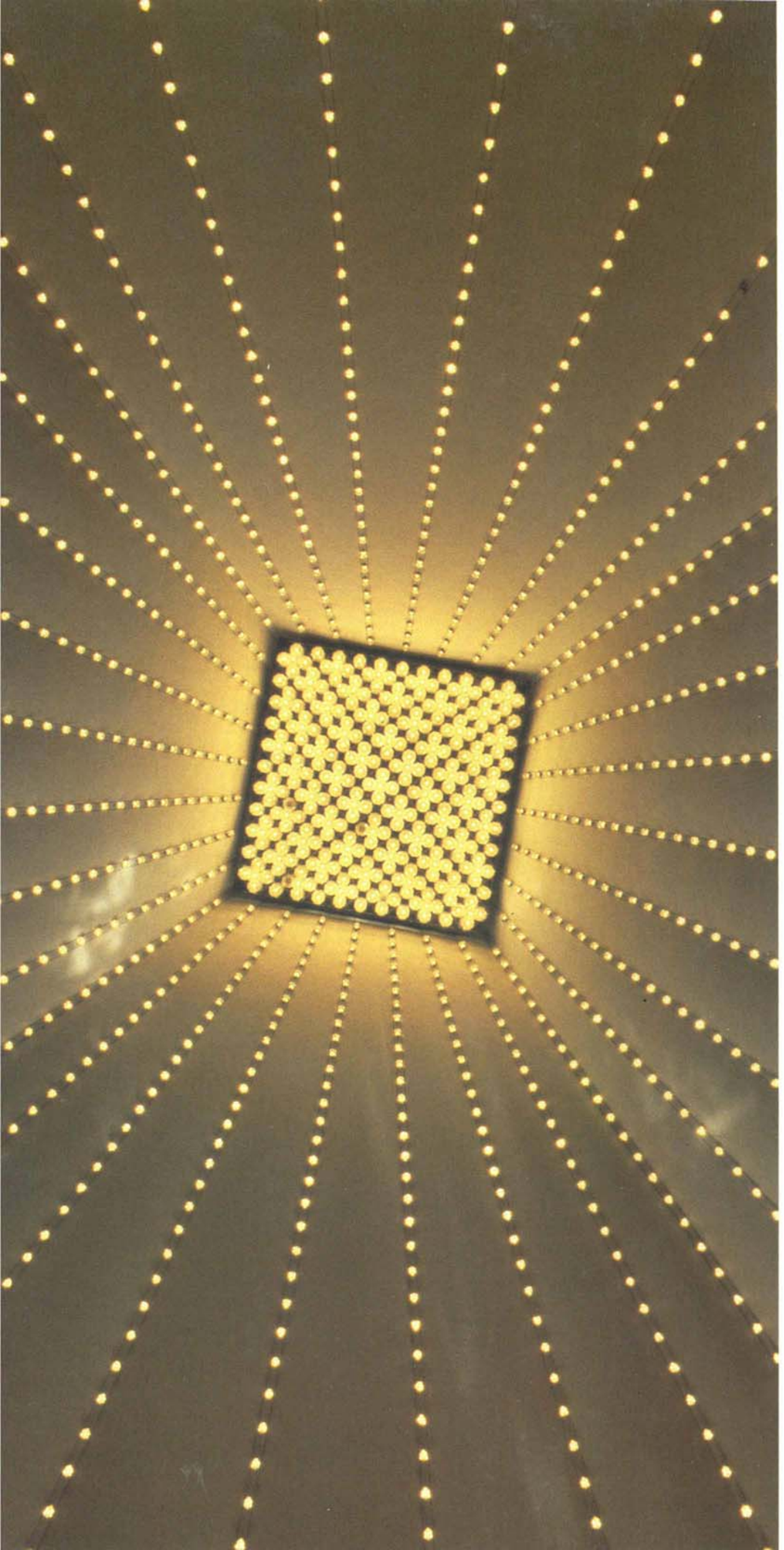

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A TERMINAL IN A TENT

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Cover: Described by one magazine as "a Modern Marvel of the Muslim World," Saudi Arabia's terminal in a tent – shown here nearing completion – will be a complex of 210 fiber-glass tents, 10 stories high and covering an area equivalent to 80 football fields. Designed as a unique answer to the need for a mammoth yet inexpensive structure to process, house and feed some 570,000 pilgrims who pour into Jiddah each year, at the rate of some 120 flights a day, during what, for Muslims, is the holiest journey of their lives: the pilgrimage to Makkah. Back cover: An interior view of the tent. Photographs by S. M. Amin.

◄ Hung from 440 steel pylons on some 246 miles of steel cable, Jiddah's "terminal tent" required 5.5 million square feet of "Beta yarn," a fabric as light as silk and stronger than steel.

A Taste for Freedom

WRITTEN AND PHOTOGRAPHED BY MICHAEL WINN

At the age of 23, Wilfred Thesiger led an expedition into territory controlled by Ethiopia's Danakils, a tribe that had already wiped out three other expeditions and was known to mutilate enemies savagely. For Thesiger, the expedition meant fear, loneliness, thirst and exhaustion, but, as one writer put it, it was also his first taste of freedom — and he never recovered.

Today, almost everyone travels; businessmen on jets, tourists in the cool luxury of tour buses, and some — the back-pack crowd — on foot. But no one travels like Wilfred Thesiger. Since he first faced the Danakils, he has spent 40 years in the wilds of the world: patrolling the Sudan on camel back, climbing the mountains of the Hindu Kush, and hunting wild boar with the Marsh Arabs in the vast swamps of the Euphrates Delta — "in the stillness of a world that knew no engine."

Thesiger's fame, however, rests largely upon the five years he spent with the Bedouins of the Arabian Peninsula. Assigned by the United Nations Food and Agricultural Organization (FAO) to study the movement of locusts on the Peninsula, he began to travel and live with the Bedouins and, eventually, cross and re-cross the Empty Quarter, the largest and hottest sand desert in the world.

To those who travel to clinch a deal or get a tan, Wilfred Thesiger's travels often seem incomprehensible. For though he has explained himself clearly, even poetically, in such books as Arabian Sands, *one of the greatest travel books ever written, and* The Marsh Arab, *Thesiger remains, by contemporary standards, an elusive, even mysterious figure. Michael Winn's recent interview with Thesiger, therefore, is of special interest; it is the first ever given by Thesiger to an American journalist and it sheds additional light on a man whose feats can never be duplicated — for reasons he makes distressingly clear.*

It was not an easy interview to get. Winn, invited to visit Thesiger, flew 10,000 miles from New York to Kenya's remote Northern Frontier District, but, delayed enroute, arrived to find that Thesiger had gone camping. Undeterred, Winn talked his way onto a chartered flight leaving an airstrip in the bush for Lake Turkana, found Thesiger and spent two weeks camping with him in Kenya's Rift Valley where, when the mood was right, Thesiger, often quoting from his own books, attempted to explain, one more time, his need for challenge, solitude and freedom.

— The Editors

Because Wilfred Thesiger ranks with such great 19th century explorers as Burton and Doughty, I was quite unprepared for the man I found camped by the blue soda waters of Lake Turkana in a bleak volcanic desert in Kenya. What I expected was someone grizzled, old and somehow wild. What I found was a polite, unassuming man in dapper tweeds looking much younger than 70 and speaking softly, if strongly, in an Oxford accent. Only his face gave a clue to his nomadic past: a nose like chiseled granite, bushy eyebrows hung like shutters to hide his deep-set eyes from the elements, and the sharp lines etched by years of squinting into a blazing desert sun.

Thesiger's camping companions were six young Samburu tribesmen – cousins to the famous Masai warrior – and the ease with which Thesiger mixed with them provided my first glimpse into a character that comfortably contained many contradictions. As for the Samburu, they refer to Thesiger as "Sangalai," which means "The Old Bull Elephant That Walks Alone."

For the next two weeks, as it happened, the Old Bull Elephant did not walk alone. Instead, he drove his 12-year-old Land-Rover, a fact that he lamented and, in what was obviously a familiar tirade, criticized fiercely. "I suppose with age I've lost some of my enthusiasm for walking everywhere. It's the bloody car and airplane that have ruined travel. It's made it too easy. In the old days, if you spent two months on a steamer getting to Africa you would stay six months and see the country properly. It kept the casual tourist out. Now things are ruined for the serious traveler."

> **"The desert met the empty sky... Time and space were one. Round was a silence...and a cleanness which was infinitely remote from the world of men"**
> **–Arabian Sands**

Thesiger has had a lifelong obsession with the destructive impact of machines. "I remember how in my youth I resented hearing that someone had crossed the Sahara desert in a car," he said. "Even then I realized that machines would rob the world of all diversity."

During World War II, Thesiger fought in Abyssinia and, as a major, in Syria and North Africa, but even then he objected strongly to using motor vehicles. "Though we were operating behind German lines, I found the Libyan jeep campaigns absolutely boring," he recounted.

"I was totally insulated from the beauty of the desert as we speeded past in jeeps. I'd rather jolt for 17 hours on a camel's back than spend 17 hours in a comfortable jeep. At least the camel offers a challenge."

A man who hates motor vehicles that intensely must, of course, do a lot of walking – and Thesiger has. How far? "Close to 50,000 miles," he says, adding dryly, "about the same distance an ordinary housefly travels in its short life." He didn't bother to add that in walking a distance twice round the earth he wore out both kneecaps and had to replace them after months of the most strenuous up and down climbing of his life – in Yemen at age 58.

Ironically, the only other serious health problem occurred when he slipped a disc pulling luggage from a train back in England. In 25 years of drinking brackish waters from ditches and wells in the Middle East – whose tastes ranged, he said, from "camel's urine to Epsom Salts" – he never became seriously ill. And though he faced and shot more than 2,000 wild boar during his eight years with the Marsh Arabs, he said he was never gored.

Accounts of such adventures led, inevitably, to the question everyone puts

to Thesiger eventually: why? What drove a man with an Oxford education to spend 40 years in the wilderness?

One writer on Thesiger, Peter Munro, put it rather neatly when he said that in the loneliness and dangers of his expedition among the Danakils, Thesiger "got his first taste of freedom – and never recovered." But as Thesiger's life suggests, there was a bit more to it than that. His taste for adventure, in fact, was planted early in his childhood when his father, British Consul to Abyssinia, began to take him big game hunting, a sport young Wilfred would pursue enthusiastically for 40 years; he found the risk addictive, as well as a good excuse for exploring new country.

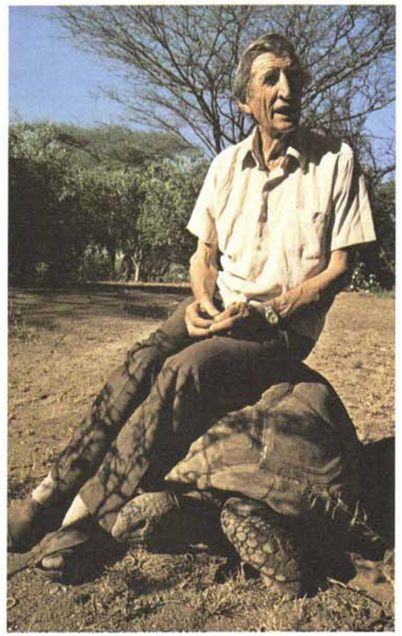
When he returned to England to attend school – where the other pupils snickered at his wild tales of colorful armies and exotic beasts in Abyssinia – Thesiger's interest in the area may have waned, but in 1930 a personal invitation from Haile Selassie to attend his coronation rekindled it. Then, after graduation from Oxford, came the chance to solve one of the last remaining geographic mysteries in Africa by tracking the course of the Awash River to the point where it disappeared in the desert – a six-month expedition that took Thesiger into territory controlled by the Danakils, a tribe notorious for wiping out three previous European expeditions. That expedition was a success; though losing 14 of his 18 camels, he succeeded in mapping the river without the loss of human lives. But to Thesiger the real satisfaction came from the exhilaration of pitting himself against the unknown.

Subsequently, Thesiger joined the Sudan Political Service, in its remote northern Darfur district. Unlike most colonial administrators, he soon learned to ride a camel – so well that on one three-month vacation he raced 2,000 miles on camel back to the distant Tibesti Mountains in Libya, then one of the few areas of the Sahara not explored by motor car.

In the Sudan he also tested his courage by facing a hippopotamus while armed only with a spear, and by hunting and shooting 70 lions. "It was not like the modern safari in which the Great White Hunter is backed by several expert guides," Thesiger told me. "I rode the lion down on my horse, jumped off and shot it just before it charged me. You could tell it was going to charge because its tail would stand straight on end."

Another time, he went on, "I was knocked down by a lion and three young Arab companions were badly mauled. I got up and shot it in the ear. The greatest danger was infection from the lion's paw, as in those days we had no antibiotics. But in 1945 I lost the desire to kill for sport . . . I've since served as honorary game warden in Kenya and worked to protect animals from poachers."

The next stage in his evolution occurred in Syria where he first encountered the northern Bedouins – Thesiger prefers "Bedu" to the anglicized "Bedouin" – and realized, with a shock, that he was prejudiced. "Raised with my parents' Victorian ideas of culture, I first went among the Arabs with a belief in my own racial superiority. But in their tents I felt an uncouth and inarticulate barbarian, an intruder from a shoddy and materialistic age."



That encounter also led Thesiger into the desert where he would later gain fame as an explorer and author. "I recall Ruwala tribesmen asking me, 'Why do you visit us now, when we are caged in our summer encampment? Come with us to the desert, where we live in freedom.'"

Thesiger soon did. When Desert Locust Control Officer O. B. Lean offered him a job traveling through Arabia to look for the breeding grounds of the locusts that periodically plague the Arab East, he instantly accepted and not long after entered the desert that he would later cross, re-cross and come to love: the Rub'al-Khali, or Empty Quarter.

Thesiger was not the first Westerner to cross the Empty Quarter by camel – nor even the second. Bertram Thomas did it first in 1931, followed by St. John Philby in 1932, and though Philby's 400-mile waterless crossing was a stunning feat, both he and Thomas took relatively easier routes. Thesiger crossed both the eastern and western "Sands" – the Bedu term for the Empty Quarter – over steep 215 meter high dunes (705 feet).

Later he also explored thousands of miles of the interior fringes of desert as well as the little known Trucial coast, now the United Arab Emirates, and from Oman down the coast of the peninsula to Yemen.

His greatest feat, however, was to win acceptance from the Rashid tribe and then live as a Bedouin for years.

Bedouin life, as Lawrence wrote in *The Seven Pillars of Wisdom,* was hard, even for those brought up in it, "and for strangers terrible: a death in life." Some have said that living conditions are among the harshest in the world, matched perhaps only by the bushmen of the Kalahari, and Thesiger does not entirely disagree.

"Certainly they were the most exacting conditions I've ever encountered," he said one evening as we relaxed under a wild olive tree surrounded by a garden of bougainvillea and succulents that Thesiger had carefully nurtured himself. "We marched 12 hours a day, at times for weeks on end, with a pint of water a day and little or no food." Daily fare, he said, might consist of a single biscuit so dry in his mouth that Thesiger often refused to eat it. "Even the Bedu considered it starvation rations; [and] our camels scrounged grasses left over from rains four years before."

To win acceptance from the Bedouin tribesmen, Thesiger tried to become an Arab – almost literally. He learned Arabic, for example, and though he modestly claims to be a poor linguist, he could – even with his "bad ear" – distinguish and understand the Arabic spoken in Iraq, Syria, Morocco, the Hijaz, Egypt and among the Bedouin of Saudi Arabia. Thesiger accepted also the normal discomforts of Bedouin life. "I refused to wear sunglasses, even though the glare off the sands was murderous. I didn't want any advantage over the Bedouin." He also wore a loin-cloth and a long, tattered *thawb,* and at night slept on his saddle rug beside his camel.

He did make certain exceptions, of course; hidden in his saddlebag were a Leica camera, some rolls of B&W 125 film, binoculars, a few books – Kipling's *Kim,* Conrad's *Lord Jim,* or a history by Gibbon – and the specimens of plants, rocks and insects which he was collecting for the British Museum or FAO's locust control work.

At one point I asked Thesiger if the beauty of the desert was worth the loneliness and isolation, and he immediately made it clear, as he had in his books, that he was not lonely – ever. "I've often wondered how many minutes I spent alone in five years in the desert," he replied. "I was with the Bedu constantly, the Bedu brought the empty desert to life. There was *no* privacy in the desert."

Later, we also discussed his preference for Arab friends over Europeans. Thesiger said he resented Europeans because they sometimes intruded on a world not their own. Paradoxically, though, Thesiger also intimated that he felt freer with Arabs because they could not penetrate his private, and essentially European, inner self. Riding along in the isolated beauty of the desert, he could tune in or out of his tiny Bedu society at will.

On the other hand, he also said that "it's always the people, not places that interest me. Without the Bedu my journey would have been a meaningless penance." Indeed, he continued, a basic reason for his espousal of the nomadic life was to experience the comradeship forged in hardship, starvation and thirst. "The human spirit achieves an essential nobility under conditions of hardship," he said. "In their courage, endurance, good temper and generosity, the Bedu were infinitely superior to my race. Their spirit lit the desert like a flame."

A dichotomy in Thesiger's thinking became apparent to me when I asked him why he had not adopted Islam, the religion of the Arabs, if he wished to share their life. He was silent a moment, then answered with genuine pain in his voice: 'The thing I envied most was their belief in God. I am resentful that science had destroyed my belief . . .'

I wonder. Could Thesiger be concealing a deeper motive for his nomadic quest? Or, more likely, was he unconscious of it? Because it is impossible to ignore the spiritual quality embedded in his writing. In the desert Thesiger had found his absolute: "The deserts I traveled in were blanks in time as well as space," he wrote. "All pretense was stripped away and basic truths emerged. "And before crossing the Empty Quarter, he writes, he joined hands with his Bedouin companions, and in what must have been an emotional moment, said solemnly: "We commit ourselves to God." Are these the words of a man without belief?

Whatever the answer, Thesiger spent the rest of his life trying to recapture those basic truths. They were not truths in the Western sense – i.e. rational knowledge – but rather a deep feeling of serenity springing from the experience of freedom pushed to its absolute limits. In the Empty Quarter, in the marshes, and later the mountains, Thesiger seems to have found an uninhibited sense of physical freedom, and in the life of the nomadic peoples a willingness to live on the edge of death that heightened his awareness of life's fullness. For most members of his own race such a life would have been purgatory; for Thesiger, it was a private, personal heaven.

This deep, desert-inspired vein of asceticism runs through Thesiger's life as well as through his books. Luxury is meaningless to him. He never smoked. He rarely drank. And, with regard to women, he assured me that at no time were his travels into the wilderness ever an attempt to escape heartbreak and that usually he was too exhausted by his journeys to even think of women; more often he dreamed of food or icy rivers.

Thesiger is quite straightforward about his motives; they are totally selfish. Though he did gather information and collect specimens for museums, this was really incidental to his private experience, and though he realized that he might win distinction as a traveler and explorer, it certainly wasn't a compelling motive; it took friends nine years to persuade him to write *Arabian Sands.* He never, in fact, seems to have sought money, power or status, refusing them when they interfered with the purity of his nomadic quest. He has often pointed out that nomadic people the world over have never fallen prey to decadence; it is only when they have settled in cities that human vices proliferated and their societies declined.

Today, these feelings have left Thesiger pessimistic about the future. With the deserts invaded by machines, and the life of tribal peoples "desecrated," he sees a bleak future. "There won't be a person alive in 50 years," he said to me in dead earnest. "Nervous breakdown, pollution and the arms race will soon do us in. Every scientific invention has been another nail in the coffin. Urban people are completely helpless. Primitive people have at least a slim hope – they know how to live off the land."

During one of our talks, Thesiger and I were sitting inside his wood hut, the walls coated with a mixture of mud and dung, the only furniture a hard, wooden bed, a small table and a folding chair. In one wall was one small window that, I thought, could hardly compare with the grand view of the river Thames Thesiger had inherited along with his mother's apartment in London. Yet instead of retiring to rest comfortably on his laurels – he has received every explorer award in England and dined with the Queen – Thesiger chooses to live nine months of the year in conditions some of his Oxford friends would probably find squalid, or, at best, beneath their dignity.

I pointed out to him that most holy men would envy his ascetic self-discipline, and suggested his expeditions were spiritual rites of passage and he replied cautiously that his journeys did strengthen his rejection of materialism. "But if my trips were rites of passage," he said, "it was unconscious."

But he mulled over what he had said – as if his tribal self were arguing with his English self. "The attraction of my trips is that life was reduced to bare essentials. I could load my entire belongings onto a camel in 10 minutes. We clutter and obsess ourselves with possessions, houses, cars . . . The Empty Quarter was great precisely because I did manage without 'possessions.' Motors especially destroy the magic of a place for me. I was shocked to see Philby motoring into Marib . . . [and] just before I left the marshes in Iraq hydrofoil boats were introduced to replace the reed *taradas* used for 5,000 years. It was more than absurd – it was a desecration!"

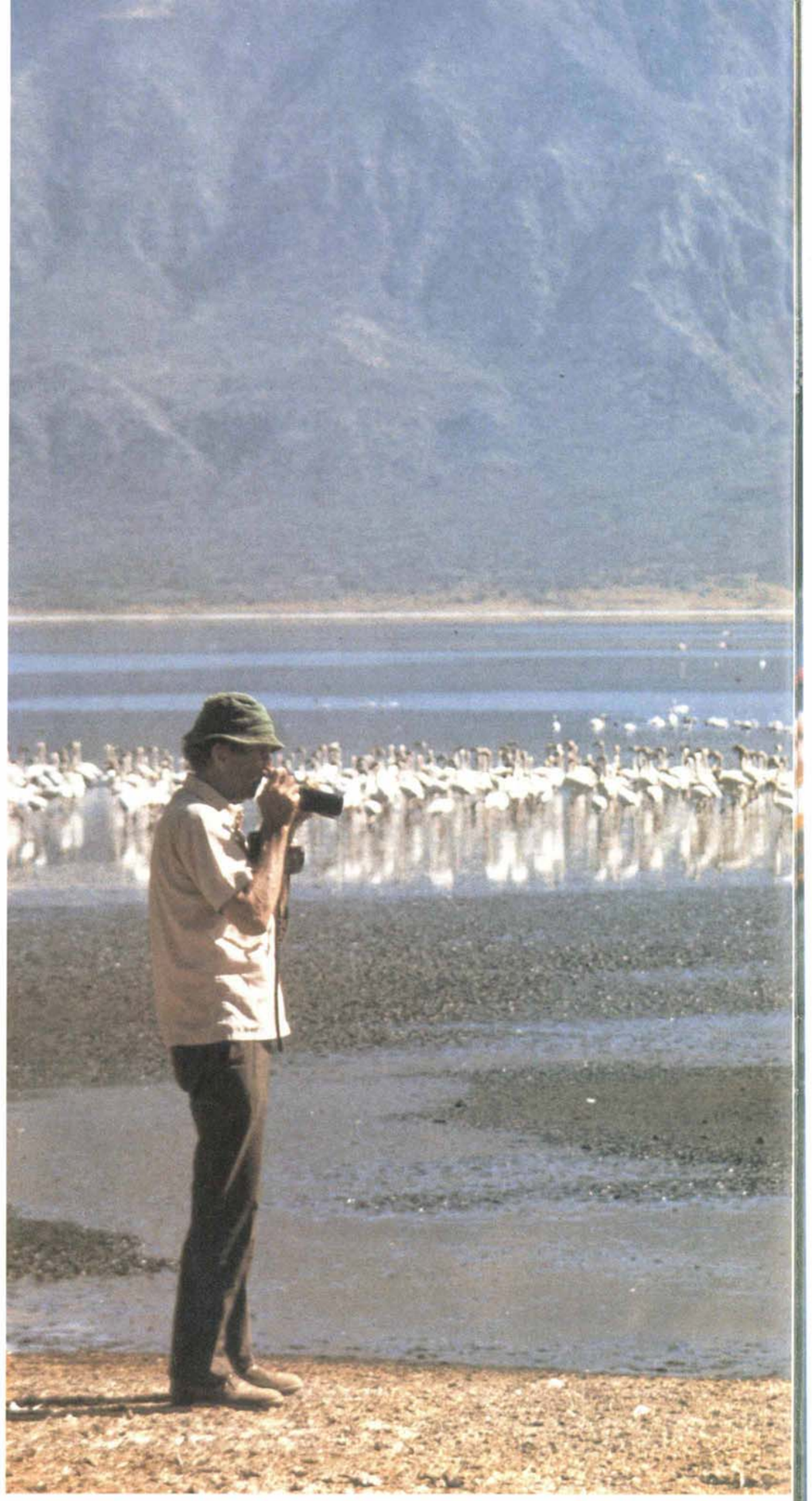
Thesiger is the world's last great traveler who can claim to have relied solely on non-mechanical, native means of transport; he walked, rode camels or, in the marshes, used reed boats. Thesiger didn't even use maps. There were none for most of the places he visited.

Today, Wilfred Thesiger has the satisfaction of knowing that no contemporary can ever match his accomplishment – not for lack of physical stamina, but simply because the world has changed so quickly the ancient cultures and wilderness he once explored no longer exist. "I was very lucky," he admits. "Everywhere I went I missed the intrusion of machine culture by only a few years."

He did so by always moving on. In a sense, Thesiger was a kind of super-nomad, whose impulse to move on was always greater than that of the nomadic tribes he lived with. In his autobiographical *The Last Nomad* (Dutton, 1980), Thesiger recounts time and again how he was forced to leave his adopted tribal home as revolutions, political and technological, forced him out of the latest variation of nomadic life to which he had adapted. "When I left Arabia after five years I knew what it was like to go into exile," he said, recalling the central experience of his life. "For several years after, I saw my countrymen through the eyes of a Bedu, like a critical and intolerant shadow that followed me everywhere."

The Sands – as the Bedouin referred to the Empty Quarter – gave Thesiger everything he wanted in life, and today he still reflects on that period more often – and more bitterly – than any other. "I can't stand it when a culture suddenly throws out all they've had for centuries and starts aping us," he says.

In rejecting modernization, Thesiger is markedly different from such Arabists as St. John Philby who, in becoming an automobile dealer, speeded up the introduction of Thesiger's hated "machines."



Nevertheless, Thesiger remains deferential to those who trod the desert before him. He strongly defends T.E. Lawrence against recent attacks and said that it was "almost an impertinence to write about the desert and Arabs after *The Seven Pillars of Wisdom*." He thinks that Charles Doughty, author of *Arabia Deserta*, "saw the Arabs more truly as they were," finds Philby's books packed with information, but difficult reading, and prefers the books of Glubb Pasha as a contemporary Arabist.

In 1977 Thesiger returned to Arabia, 27 years after he left it, and found it unrecognizable. The fact that he was received as a returning hero – Abu Dhabi had put his face on a postage stamp – made no difference to the despair that overwhelmed him as he watched a parade of schoolboys in sequined trousers play pop music and carry plastic palms about.

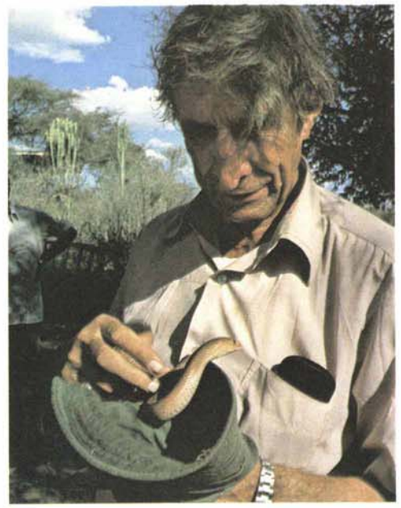
He was particularly dismayed to find that modernization had affected even the Bedouins. "I assure you the Bedu have ceased to exist," he said. "The Bedu struggle for survival depended on camels and on raiding. You can't be Bedu *and* whiz through the desert in a Mercedes Benz – it's a contradiction in terms. They now even transport their camels by lorry. The camels have probably degenerated and are in danger of losing their thoroughbred qualities. The camel race in Abu Dhabi is ridiculously short, three times around a track – you need 60 or 100 miles (96 to 160 kilometers) to test a camel's mettle."

Thesiger's trip was a media event. He flew out to the desert with a TV crew in a helicopter, where cars took him to meet Bin Kabina, once his guide and companion, now a gray-bearded older man. The meeting, however, was a disappointment. "All feeling of real comradeship was disrupted by modernity," Thesiger recalled.

"The whole challenge of . . . Bedu life," he went on, "has been killed. In the Empty Quarter, the Arabs lived on the knife edge of survival – threatened constantly by raiders, drought, starvation – yet they were always cheerful and laughing happily. Back then I never met a depressed desert Arab in my life. Now, I fear many are becoming neurotic and depressed . . ."

The loss Thesiger felt is not limited to Bedouin culture. The once plentiful oryx, ibex and gazelle, for example, have been hunted for sport, sometimes from cars, and at one point were close to extinction. Yet hunting continues, he says, because of the Arab passion for shooting.

"In Yemen, I nearly had my feet shot off by an entire patrol firing their machine guns at a nearby rabbit," he noted with amused dismay, [and] "the fragile desert ecology is being destroyed by motor tracks – which are permanent."



Thesiger claims the true Bedu skills are almost completely gone. In 1968, he said, some Americans planned to cross the Nafud Desert in north central Saudi Arabia in order to read Arabic poetry in the context which first inspired it, but could not find enough camels and had to send a lorry off 150 miles to fetch camels fit for riding. "Then they couldn't find saddles or guides!"

And now? Today? Today, Thesiger lives in Africa – and among Africans – most of the time. In his compound are 17 Samburu, some of whom, he laughs, "meet my definition of a gentleman – someone who has never ridden in a car, flown in an airplane, or watched TV."

There is just enough wildness left in this part of Kenya to satisfy Thesiger's need for a sense of risk. Elephants occasionally wander past, and a wild buffalo recently gored a man to death 200 yards from the *manyatta* (183 meters). They keep dogs to ward off lions, and there is much excited gossip about the dreaded *noroko* – cattle raiders from Somalia and Turkana – now armed with AK-47's and mortars.

Thesiger's health is such he may well live until the year 2000. He has stopped trekking, but his mind hasn't; he is half finished with what he swears is his last book – on his campaign in Abyssinia and his travels there and in Kenya by camel. He says it is hard going as he is mentally lazy – the same excuse he gives when accused of being fearless: "My lack of fear is really just a lack of imagination," he says.

But then I ask what he'll do for the next 20 years, and a black, vacant look crosses his eyes for a moment. "There is virtually no place I want to go now," he replies slowly. "There are tarmac roads everywhere." He shrugs with a hint of resignation. "I'm being boxed in gradually by civilization . . . I might like Burma. But I'll probably go to India – it has a vast and authentic culture. Perhaps the Kashmir."

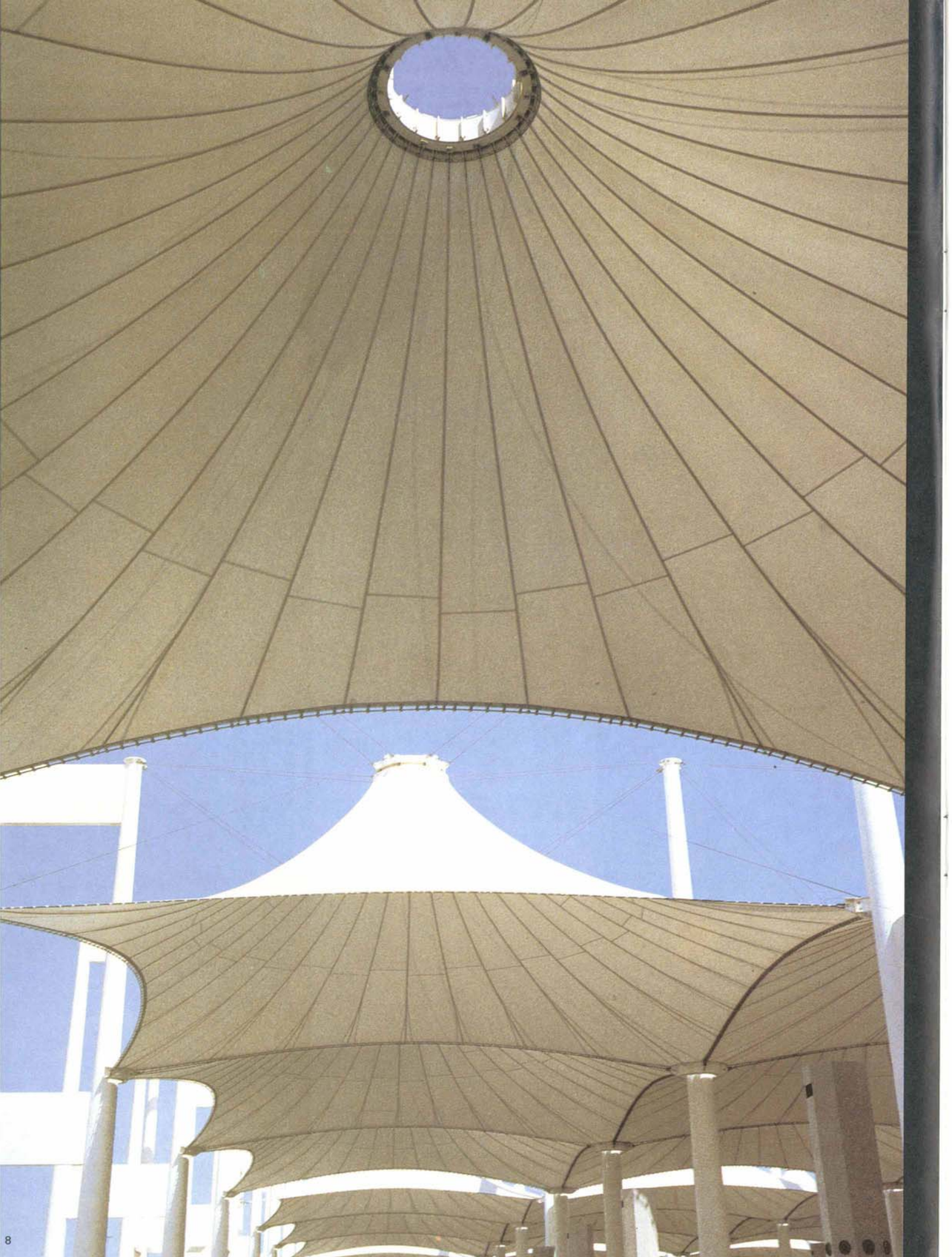
If so, my belief is that Thesiger will go in search of the India of Rudyard Kipling's *Kim,* which Thesiger has read over 40 times and considers pure poetry. Kim is an English orphan boy who moves about the local cultures as easily as he changes clothes, and who, amidst adventure and intrigue, meets a nomadic Tibetan lama who tries to guide him on the way, and shares his final moment of enlightenment with him.

"When I was a boy," Thesiger had told me, "the world was my oyster. The British Empire was still in its glory, and adventure was to be had for the asking." The parallels between Kim, an orphan, and young Thesiger – whose father died when he was 10 – are obvious. If their quests could have a similar ending, I think Thesiger would die happy. Thesiger is still part Kim and part lama, grappling with a life rich in the paradoxes of a man who has lived in more worlds than most men are capable of dreaming of: a strict ascetic, he has been wildly selfish in seeking his freedom; in environments that would kill many men he has found peace; uncompromising in his praise of tribal life throughout the world, he also upholds the glory of the British Empire which colonized and developed those same tribes.

Thesiger is remarkable for his empathy with tribal people, his attachment to animals, his innate spiritual feeling for the controlling power of the land itself. Yet the man who successfully evaded machine culture for most his life, has failed to find lasting serenity in an irritating world of noise and speed.

On the other hand, Thesiger has lived without compromise, opposed the tide of change and inspired others to seek adventure in their lives. Ahead of his time – and forever out of sync with it – he is *the* last of a dying breed and when he, the old Bull Elephant, dies, the species will be extinct.

Michael Winn, a graduate of Dartmouth, has written for Geo., Harpers, Parade *and* The Saturday Review, *usually on the subject of rafting expeditions which he has joined in Colorado, Yemen, Ethiopia and elsewhere.*



A TERMINAL IN A TENT

WRITTEN BY JOHN LAWTON
PHOTOGRAPHED BY S. M. AMIN

FOR THE PILGRIMS TO MAKKAH...

Tents have been used continuously in Arabia for centuries: as homes for hardy desert herdsmen; as shelters for early oilmen, the geologists who explored Saudi Arabia's Eastern province for oil; and – spread by the thousands across the plains of 'Arafat and Mina – as lodgings for Muslim pilgrims to Makkah. But the tent put up by Saudi Arabia in Jiddah last year must be the biggest and most imaginative in history. Hung from pylons and covering more than 40 hectares (100 acres), this tent is an airline terminal – a terminal designed specifically and exclusively as a transit area for Muslims making the Hajj, the pilgrimage to Makkah.

In its basic design, the terminal-tent is similar to that of the Bedouin's traditional black tent – strips of cloth slung between poles driven into the ground – but the similarity ends there. For one thing, the terminal-tent – actually 210 separate tents with their edges joined – is one of the largest structures built in modern times; the tent's roof covers an area bigger than the Pentagon – once the world's largest office building. For another, the terminal-tent, unlike, say, circus tents, is not attached directly to the ground, but is suspended in mid-air – six stories from the ground.

To Muslims, the pilgrimage to Makkah one of the five pillars, or basic requirements, of Islam, is probably the most sacred act of their lives. If they possibly can, all Muslims must make the Hajj at least once, no matter where they live nor how far they have to come.

In the past, this was often a heroic undertaking in which pilgrims faced danger and death and sometimes spent years to complete.

Back in the early days, pilgrims, as one writer described it, (see *Aramco* World November- December 1974):

... converged on Makkah in three slow-moving waves. One – from the coast of East Africa and the horn of Africa, from the great inverted triangle of the Indian subcontinent and from the sprinkled archipelagos of the East Indies – came as an armada of ships ploughing north and northwest across the blue expanse of the Indian Ocean and on overloaded dhows sailing over the green waters of the Arabian Sea. Another – moving still more slowly – came on foot and by horse and camel in three great caravans, the first plodding southwards from Damascus with Hajjis from Lebanon, northern Iraq and Turkey, the second from Cairo, bringing, along with the devout from Egypt and the whole North African littoral, a new covering for the Ka'ba, and a third caravan crossing the Peninsula from Baghdad.

The third wave, rippling eastward with painful slowness, came trudging across the vast width of Central Africa, from what are now Mauritania, Senegal, Guinea and Sierra Leone through Mali, Niger, Nigeria, Chad, and the Sudan to ports on the Red Sea.

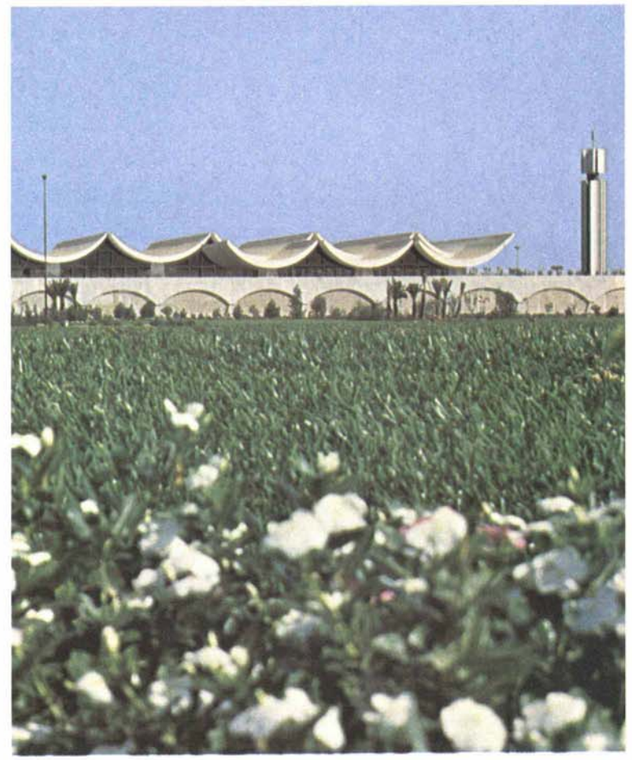
Over the years, of course, advances in transportation effected changes in the pilgrimage. The introduction of steamships, for example, and the construction of the Hijaz Railway, from Damascus to Medina, reduced or ended the great camel caravans by which thousands of Muslims once traveled to Makkah. But the most radical change came in the 1950's when a Lebanese airline converted some World War II planes and chartered them to groups of pilgrims. By the early 1960's, as a result, the airline was chartering special flights to and from Jiddah for national airlines in India, Ceylon, Iran, Turkey, Cyprus, Somalia, Ghana, Senegal, Nigeria and the Central African Republic, assigning, in some cases, up to five Boeing 707's to a country to shuttle between that country and Jiddah for six to eight weeks – carrying close to 1,900 pilgrims a day.

In making it possible for Muslims to get to Makkah swiftly and safely, the introduction of aircraft was tremendously important to the world of Islam. Millions who once could never have dreamt of going on Hajj, began to save for the airfare and other tens of thousands set off immediately. By 1974, airborne pilgrims were pouring into Jiddah at the rate of 120 flights a day and in 20 years, statistics show, the pilgrimage total went up six times, and in 1980 was 1,940,634.

For Saudi Arabia, of course, the logistical impact of this steadily multiplying influx of pilgrims was immense but by the late 1970's authorities had met the challenge – by building large transient centers, from which the pilgrims could travel directly and speedily to Makkah from Jiddah; by constructing a network of roads linking Makkah with 'Arafat, Mina and Medina; and by organizing an army of workers at 'Arafat and Mina to put up and take down the immense tent cities, which, every year, house more than a million people. One problem, however, stubbornly resisted solution: how to process, house, feed, transport and – at times – provide medical care for hundreds of thousands of pilgrims pouring into the airport in a very short period?

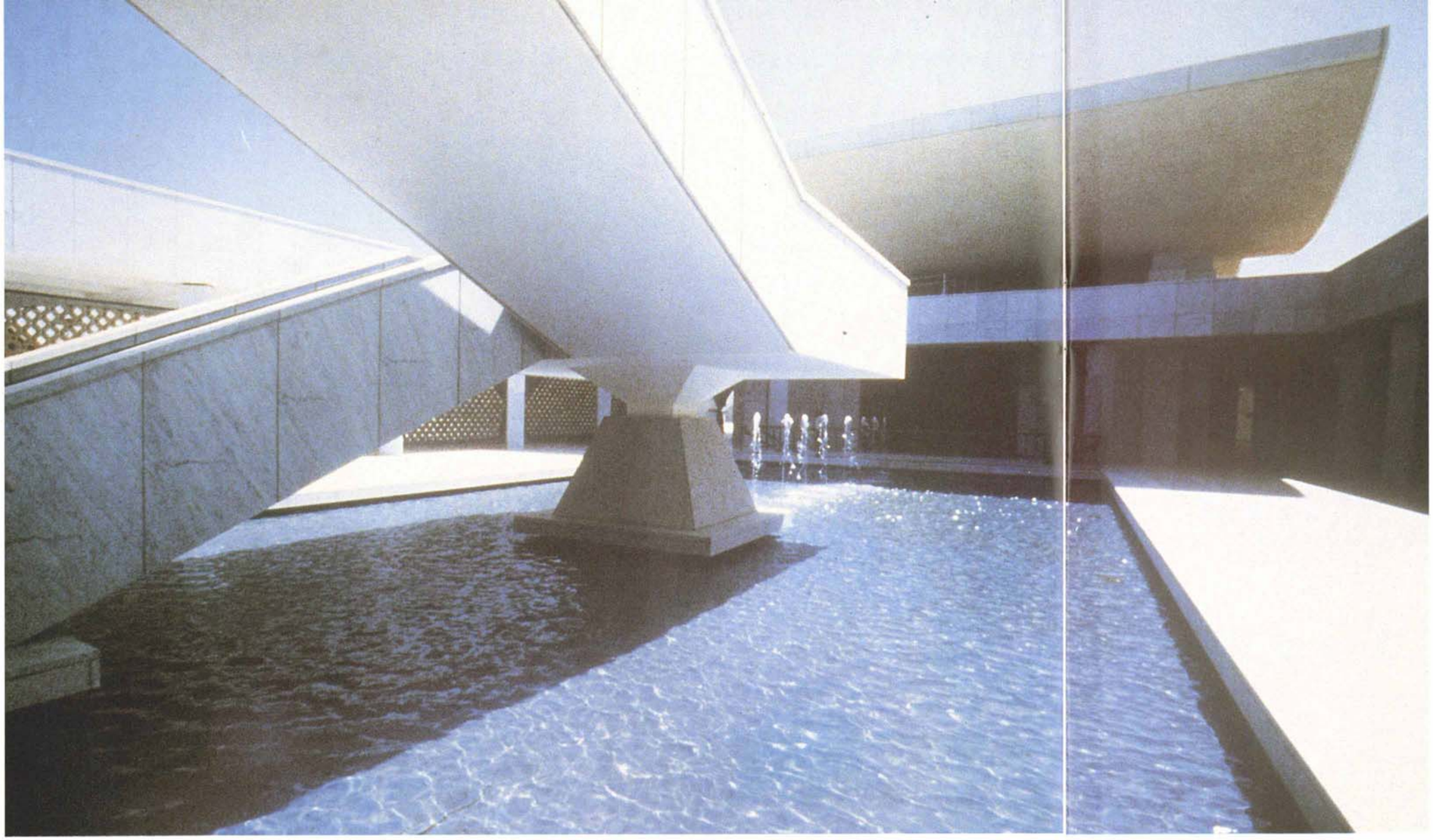
In one sense, this problem is insoluble. Under Islamic law, pilgrims must make the Hajj between the eighth and 13th days of the 12th month of the Muslim lunar year

Photos by Kevin Haupt Courtesy International Airport Projects



As construction of Hajj terminal units got underway, the Beta yarn, fiberglass fabric was gathered and attached to a central metal ring, laced to radial cables in sleeves, and slowly hoisted upwards (above) by giant cranes (top right) to the top of 80-ton steel support pylons (center right). At lower right: a view of the other domestic and international terminal roofs and the air traffic control tower.

Photo by Carl Bvoir & Associates, Inc.



The new Jiddah airport covers 103 square kilometers (40.5 square miles), much of it devoted to the vast Hajj terminal, the striking — and unique — architectural structure on the site. There are also two commercial airline terminals — one just for Saudia, the national airline — a Royal Pavilion for use by the King, the Royal Family and official guests, three mosques, an air freight center, and normal airport operational facilities, including modern baggage handling equipment.

– Dhu al-Hijjah – which means that all the pilgrims arrive over a period of just a few weeks. As some 532,000 pilgrims came by air in 1979 and 572,300 pilgrims in 1980, that means that every year Jiddah Airport had to gear up for a one-month increase of close to some 50,000 passengers a day. Too small for that growing metropolis, even in normal times, Jiddah's airport simply didn't have the facilities – nor the extra immigration and customs personnel needed to adequately examine the passports and luggage of the tens of thousands of pilgrims pouring off the planes, particularly during the hectic 10 days before the start of the Hajj. The airport also increased the space to accommodate them while they waited for transportation to Makkah, some 64 kilometers (40 miles) away.

The problem was exacerbated, moreover, by the fact that many pilgrims are old and that many – fully half – are from distant countries, which means they don't speak Arabic. In addition, many have never traveled before. As a result tens of thousands of pilgrims pouring off the jets into Jiddah's airport are disoriented and bewildered.

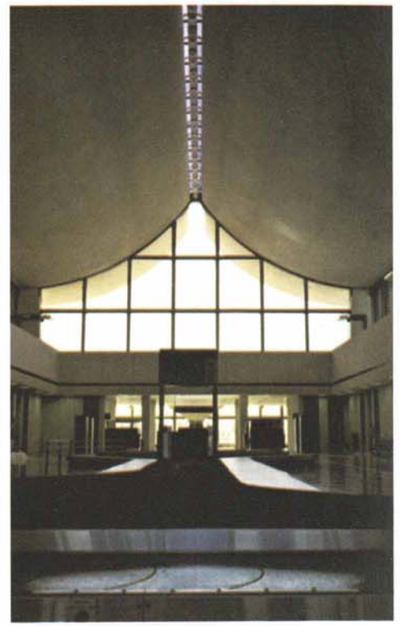
Nevertheless, Saudi Arabia and the architects it engaged did solve the problem: first by providing a wholly separate Hajj terminal – a terminal exclusively for the annual influx of well over 500,000 pilgrims and as many as 50,000 on a single day – secondly by introducing the concept of a terminal in a tent.

The exclusive Hajj terminal, in turn, was an offshoot of Saudi Arabia's vast airport construction program. Managed by the Kingdom's International Airports Projects, this program included three massive airports: one in the Eastern province, one in Riyadh and one in Jiddah – a 103-square-kilometer airport (40.5 square miles) twice the size of Manhattan.

A badly needed facility, the new Jiddah airport will serve 42 airlines and is expected to be handling 8.6 million passengers annually by 1985 and 10 million in the year 2000. It will include two commercial airline terminals – one just for Saudia, the national airline – a Royal Pavilion for use by the King, the Royal Family and official guests, three mosques, an air freight center – with a capacity to handle 150,000 metric tons of cargo annually – and, the most striking feature of the airport, the Hajj Terminal complex.

The size of the Jiddah airport was a factor in the decision to build a separate Hajj terminal; because the new airport, which was dedicated April 12, is one of the largest in the world, the addition of an extra terminal posed no problems of space; there are, in fact, three separate terminals.

What did pose problems, however, was the need to build a structure in which the incoming pilgrims could be processed like ordinary international travelers, yet also live there for a day or two after their arrival, while awaiting transport to Makkah, or locating their *mutawwifs* – the specialized guides who arrange housing and transport for pilgrims, and provide advice on Hajj ritual.

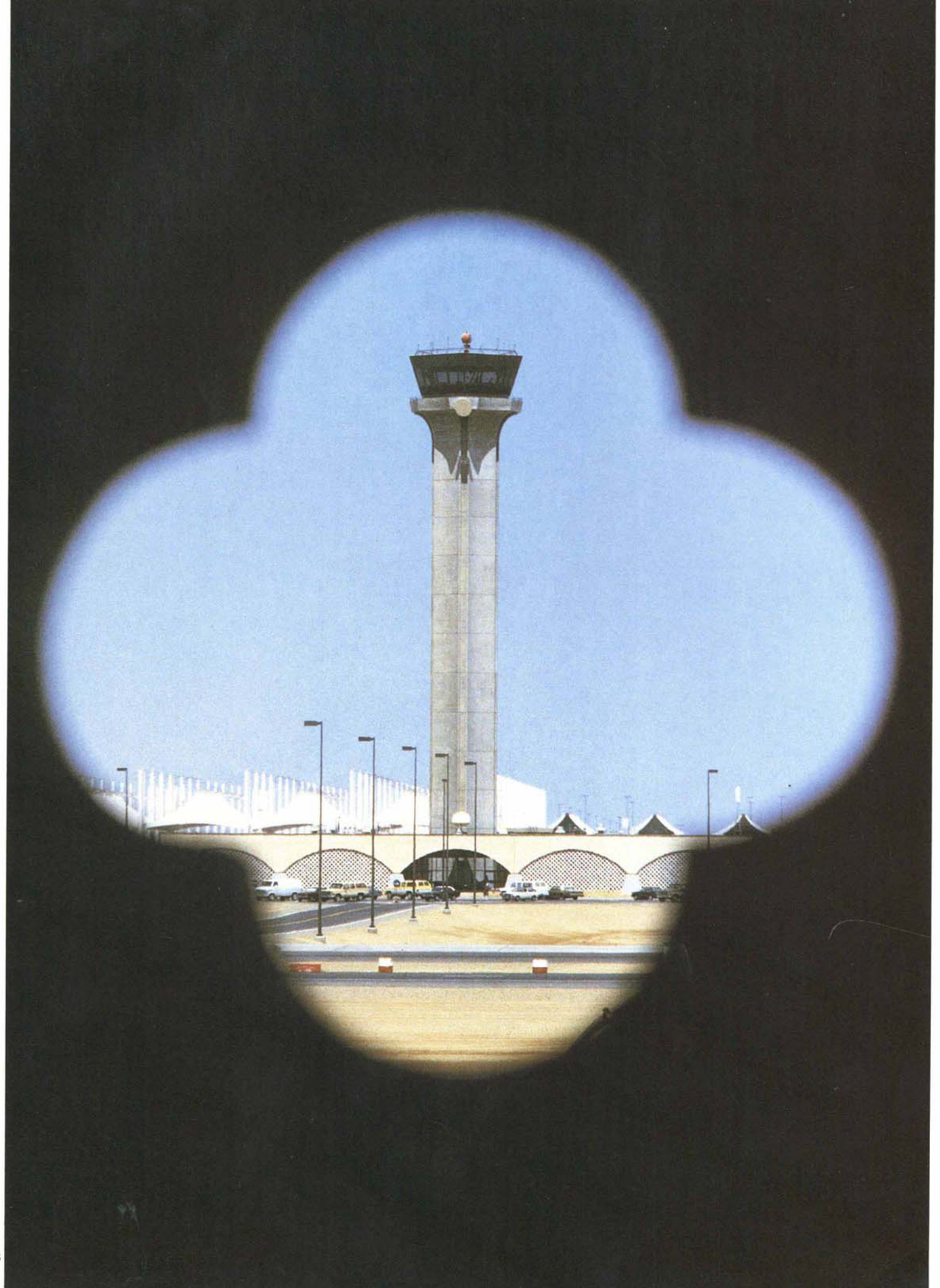


It posed problems because a building big enough to accommodate up to 50,000 pilgrims who might be waiting in the terminal at any one time would have to be enormous. It would be extremely expensive, furthermore, to maintain and air-condition and would only be in use for a few weeks a year.

In trying to solve those problems, Skidmore, Owings & Merrill – a firm of architects headquartered in New York and Chicago soon concluded that a single building enclosing both processing and waiting zones would be too impractical to build, air-condition and maintain. Instead, they decided they would provide two kinds of space: a series of enclosed, air-conditioned buildings for disembarkation – immigration and customs – and a much larger, yet sheltered waiting area.

Putting up the enclosed buildings was no problem, of course. But to design an enormous open waiting area which would allow mass movement, provide shelter

Saudi Arab dignitaries, join members of the Royal Family, along with local and national government officials and guests, at the April dedication of the new airport in Jiddah. Among those attending were H.M. King Khalid, H.R.H. Amir Sultan ibn 'Abd al-'Aziz, the Minister of Defense and Aviation, and Muhammad Sa'id Farisi, the Mayor of Jiddah. Officials unveiled a handsome plaque, a permanent marker commemorating the occasion.



from the sun, and include water, toilets, medical facilities and space to sleep, wash and cook was something else. Could they use trellises, perhaps? Or concrete "mushrooms"? Roofs of light material? All those possibilities and others were considered, but were dropped when calculations quickly disclosed that the quantities of stone or metal needed would be too huge and too costly.

Then, however, they began to discuss a new – and unique – fiberglass fabric developed by Owens-Corning Fiberglas Corp. and being manufactured at a plant in Rhode Island. Made of Beta yarn, this fabric was reputed to be six times finer than silk, but, pound-for-pound, stronger than steel. Coated with Teflon to reflect the sun's rays, and treated with chemicals, paints and plastics as protection against the harsh elements of the Red Sea air, could this fabric provide the light, strong and comparatively inexpensive material that the Hajj Terminal needed? The architects thought it could.

In choosing fabric, of course, the architects were committing themselves to some form of tent, a structure that, for a Hajj terminal, was particularly suitable. Before the advent of air travel tents were used as overnight shelters by pilgrims making the long overland trek to Makkah, and to this day vast tent cities spring up at 'Arafat and Mina as the Hajj reaches its height.

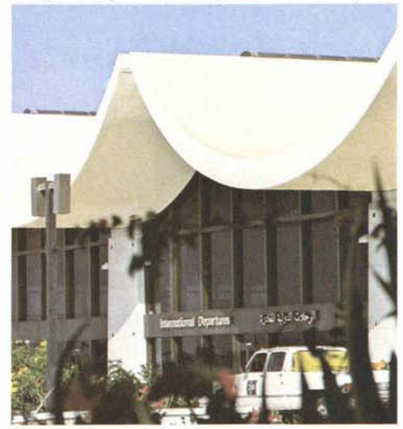
With regard to architecture, this ancient form of shelter may be one of those ideas whose time has come – or come back. Spurred by the development of new fabrics, architects around the world had began to use tents as sports stadiums, shopping malls and exhibition halls – such as the U.S. Pavilion at Expo '70 in Japan. Why not then, put a terminal in a tent?

No one had tried anything as ambitious as an airline terminal but once Skidmore decided to try it – and won Saudi Arabia's backing for the experiment – architects began to predict that the Hajj terminal could do for fabric what London's famous Crystal Palace did for steel and glass in 1885: catch the attention of the world's builders and eventually bring about a new architectural style.

More to the point, fabric in architecture is efficient, at least in some climates. At Jiddah, the great fiberglass roof – looking rather like a roiled surface of a vast sea – provides a giant canopy through which soft, natural light is filtered onto the 105-acre area below – eliminating the need for electric lights in the daytime. Because the sides are open, breezes off the Red Sea cool the pilgrims beneath the canopy and are then sucked up through conical openings 10 stories above creating a constant flow of air without the cost of air-conditioning.

Below the canopy, in a shaded, pleasant and open area, the pilgrims can, in effect, camp out, without exposure to the sun and with all the comfort and facilities of a modern, enclosed, terminal building: telephones and telexes, a post office, *suqs* (shopping areas), restaurants, bus station and taxi stands, a car rental agency, an information desk, a first aid station and a dispensary, and, special to this terminal, kitchens, since many pilgrims prefer to cook their own meals.

A key point in providing a separate terminal, of course, was to isolate the daily Hajj passengers from normal air traffic; in addition to waiting facilities, therefore, the architects had to provide normal customs and immigration facilities. They achieved this by designing the Hajj terminal in the shape of a great rectangle and dividing it



into identical halves with a mall in the center and two aircraft aprons at opposite ends – each capable of accommodating 10 Boeing 747's.

Each half of the complex contains five identical modules, and each of them in turn comprises an enclosed passenger-processing building and a waiting area. Pilgrims disembark through enclosed bridges linking their aircraft with one of the 10 modules, complete their passport and customs formalities in the enclosed area and proceed, in a one-way flow, to the adjoining waiting zone where they may rest, shop, cook, eat, wash and, if necessary, sleep – while waiting to start the last leg of their journey to Makkah: a bus trip leaving from the central mall.

Construction of the tent, obviously, was somewhat different from construction in stone, steel or glass. The differences, in fact, start with the manufacture of the materials: 510,967 square meters (5.5 million square feet) of teflon-covered fiberglass fabric, from Rhode Island; the 440 steel support pylons – made from 30,000 tons of rolled steel – from the shipyard city of Tsu, Japan, and transported to Jiddah by ocean-going barge; and some 246 miles of steel cable from the Beaujolais district of France.

Each of these components had to be virtually perfect at the manufacturing stage since the builders in Jiddah could not go back to the plants for replacements in case of trouble. "There was no time for trial and error in the field," says one of the contractors involved. "All components had to fit, all tools had to function correctly, and all methods had to work first time."

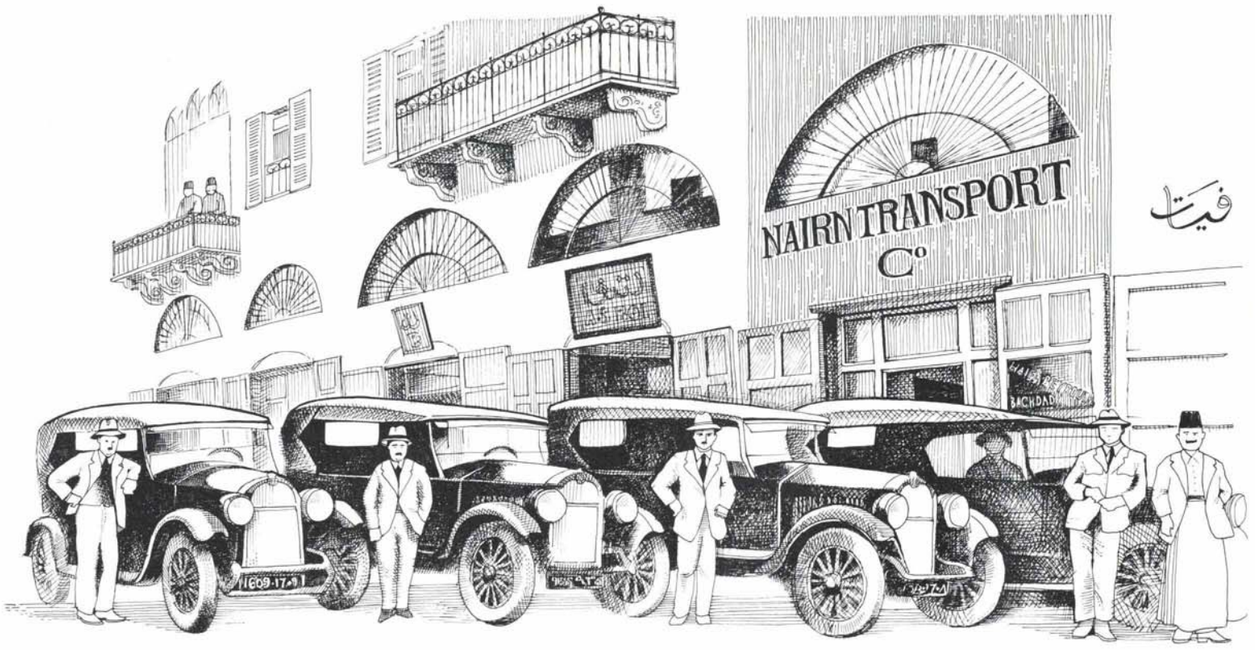
To make sure they did, a $2.5-million prototype testing program was carried out at Owens-Corning Technical Center in Granville, Ohio. Additionally, a training program was established for the work force, and in May, 1979, in an operation similar to raising a circus tent, construction of the first units began.

The first step was to position the 80-ton steel support pylons on concrete pads and secure them with giant bolts; this entailed use of a 280-ton crane – the largest of its kind in the world. Next, cables were attached to the top of the pylons and a 16-foot, two-section metal ring was suspended 33 meters from the ground (110 feet) between each set of four.

In the third stage, the bottom half of the metal ring was lowered by pulley to the ground, the top of the tent units – each measuring 2,415 square meters (26,000 square feet) – was attached to it and the ring then raised into the air, the fabric draped from it.

Next, workers pulled the bottom of the fabric outwards and secured the edges to cables extending between four pylons, to form a square frame for the unit's bottom. The workers then laced into sleeves 32 radial cables, stretching from the top center ring to the lower outside edges – which shaped and strengthened the unit like spines of an umbrella – and, when 21 units were completed, hoisted all the 21 units to their full height, and bolted the upper and lower sections of the central support ring together.

Since then, this process has been repeated over and over again – and will continue to be repeated until all the 210 units are in place and their edges joined together to form a single continuous covering. Most of the units should be in place by October, when the 1981 Hajj will take place, but completion is not expected until 1982. Even now, however, it's obvious that the tent is precisely what *Fortune* called it: "a modern marvel of the Muslim world".



ACROSS THE DESERT TO BAGHDAD...

THE NAIRN WAY

Condensed from The Nairn Way, *by John M. Munro, Caravan Books, P.O. Box 344, Delmar, N.Y. and Librairie Internationale, Gefinor Center, Beirut, Lebanon.*

WRITTEN BY JOHN MUNRO – WITH MARTIN LOVE
ILLUSTRATED BY PENNY WILLIAMS

There's an old maxim that says, if you want to succeed in business find a need and fill it. And that, in a nutshell, is the story of Gerald and Norman Nairn, the men who pioneered the famous bus route across the Syrian Desert – the Nairn Way.

In a sense, the establishment of the transport service – the Nairn Transport Company – was accidental. After leaving their native New Zealand and serving in the British Army during World War I, the Nairns decided to set up a business in the Middle East selling automobiles. For the Nairns, it was an obvious choice. They had run a successful motorcycle dealership in New Zealand before the war, and knew, as well as anyone at the time, the internal working of the combustion engine. Their father, in fact, was one of the first people in New Zealand to own a car – a single cylinder, four-seater American Reo bought in 1905.

More important, there was a need to be filled. In the Levant and Syria in 1919, there were very few automobiles and the few cars you did see had a precarious existence; their owners knew little about how they worked and even less about how to repair them if they broke down. So, with backing from an Arab family in Beirut, who saw the potential in the automobile business, the Nairn brothers went into business.

By the end of the next year, however, business was so bad that they made a second decision: to run the cars they couldn't sell. They opened a taxi service between Beirut and Haifa, in Palestine.

Because their taxis soon cut the travel time for the 112-kilometer journey (70-miles) to less than a day – compared to the three days then usual for horse-drawn conveyances – the Nairns soon had to schedule daily trips, which in turn meant additional drivers and more cars.

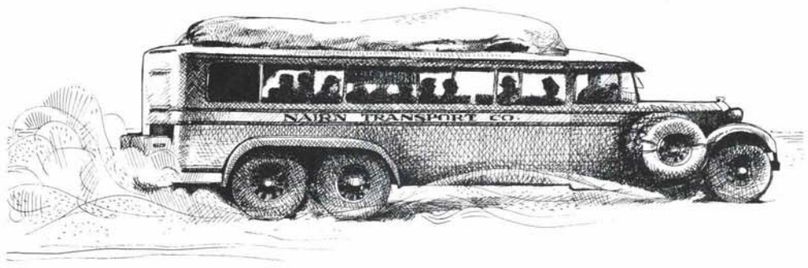
Until then, they had been using Buicks, but now Norman Nairn decided to buy two of the famous "Stanley Steamers," kerosene-fired, two-cylinder vehicles which had proved their worth on the smooth flat highways of America, but turned out to be quite unsuitable for the Nairn Way – and nearly ruined the venture.

In Stanley Steamers, the engines were coupled to the back axle and power was generated by a boiler that vaporized the kerosene, a process which took about 20 minutes. Once the steam was up, these automobiles could accelerate from zero to 64 kilometres per hour (40 mph) in a matter of seconds, but since they had no accelerators and no gears, drivers had to regulate their speed by opening and closing the steam valve, and couldn't really slow down without using the brake – which imposed a severe strain on the whole braking system and necessitated the frequent change of brake linings.

Another disadvantage was that after a long journey, the steam pressure would drop, the cars would stop and the driver would have to go through the laborious process of getting up steam again. As fresh water was not always available, the Nairns had to equip the cars with extra water tanks, thus increasing their load.

Another problem was that kerosene, often adulterated with water, played havoc with the car's vaporizing system. Soon, therefore, the Nairns swapped the Steamers for two second-hand Cadillacs.

There were other difficulties too. The track between Acre and Haifa, for example, included an eight-mile stretch of beach which was often flooded at high tide. The Nairns, equal to the challenge, took along a young boy who would ride on the running board and wade out in front of the car when the beach was underwater to find out if the water was shallow enough to allow passage of the vehicle. They also had to contend with the owners of the horse-drawn carriages whose business had been severely curtailed by the Nairns' service; they would pile rocks and boulders on the Beirut to Haifa track and try to intimidate the drivers.



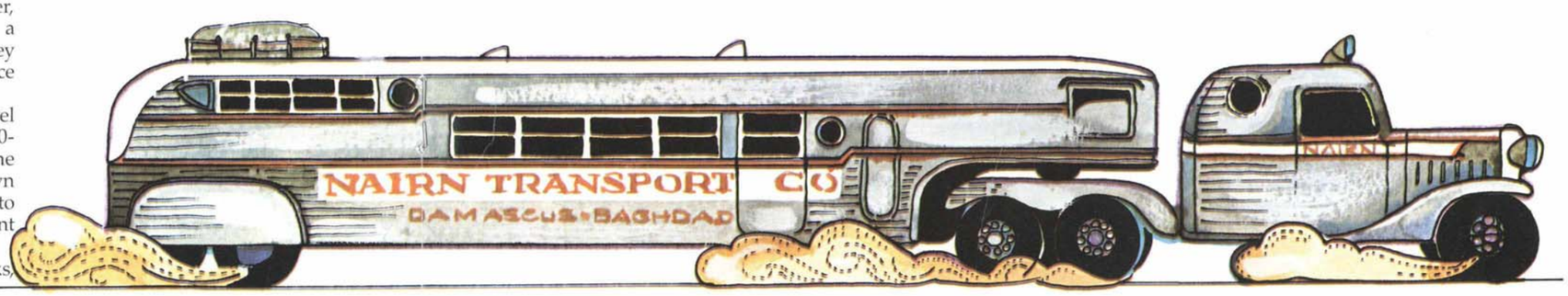
Problems like that, naturally, cut into revenues, but with a loan to tide them over the Nairns not only survived, but extended the service to Damascus.

The first real success, however, came in 1923 when the British consul in Damascus, C.E.S. Palmer, asked them to explore the feasibility of crossing the Syrian Desert by car.

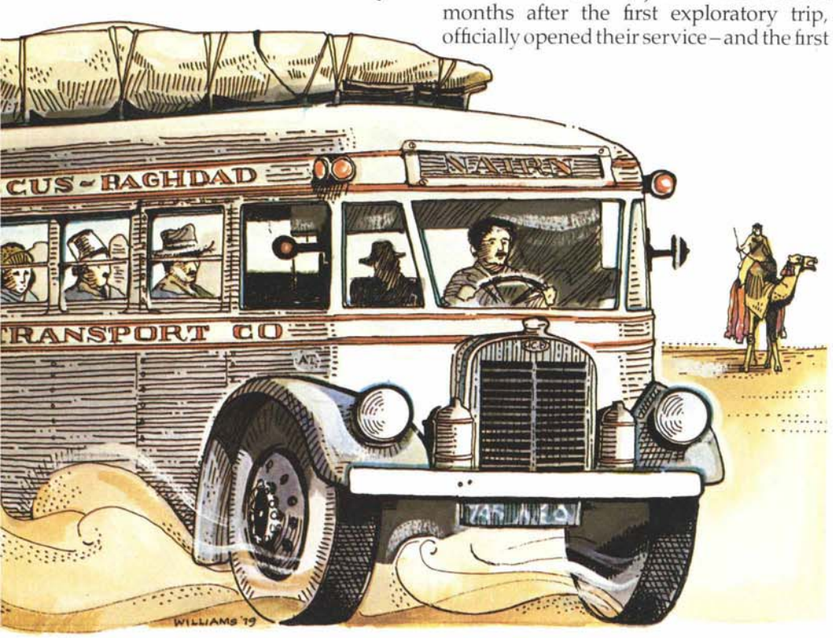
This was not a new idea. Lord Allenby, the British commander in the Middle East during the war, had visited the ruins of Palmyra in a Rolls Royce tourer and in 1919 a convoy of 10 Fords had tried to cross the desert from Damascus to the Euphrates. Clearly, it was possible to cross the desert by automobile, but whether it was possible to create a regular service was far from assured; six of the Fords had to be abandoned.

At that point, the Nairns received encouragement from an unexpected – but necessary – source: a powerful Bedouin tribal chief, engaged in trade between Damascus and Baghdad. Like all traders of the time, the shaikh had been transporting his goods on camels. But as this was slow and risky – because the caravans, highly visible in the desert, were relatively easy targets for marauding tribesmen – the shaikh decided that a fast motor route across the desert would be valuable.

On April 2, 1923, the Nairns set off on the first of six exploratory trips from



Damascus. Three days and 880 kilometers later (550 miles) the convoy – a Buick, an Oldsmobile and a Lancia pulled up in front of the Maude Hotel in Baghdad. After one of these trips, Norman Nairn proposed to British officials in Baghdad that he and his brother provide a regular mail service between Damascus and Baghdad. He pointed out that by using the desert track the normal time for mail deliveries between India and Great Britain could be cut down to nine or 10 days – instead of the customary six weeks needed to send mail by ship through the Suez Canal – by linking the overland route to the arrival of ships at Port Said.



British officials in Baghdad were skeptical, and so were the French authorities in Damascus. But the French government eventually approved the idea after all – even agreeing to provide a subsidy in gold to pay desert tribes for a guarantee of safe passage across the desert – and the Nairns, as a result, signed a contract with the Iraq Posts and Telegraphs.

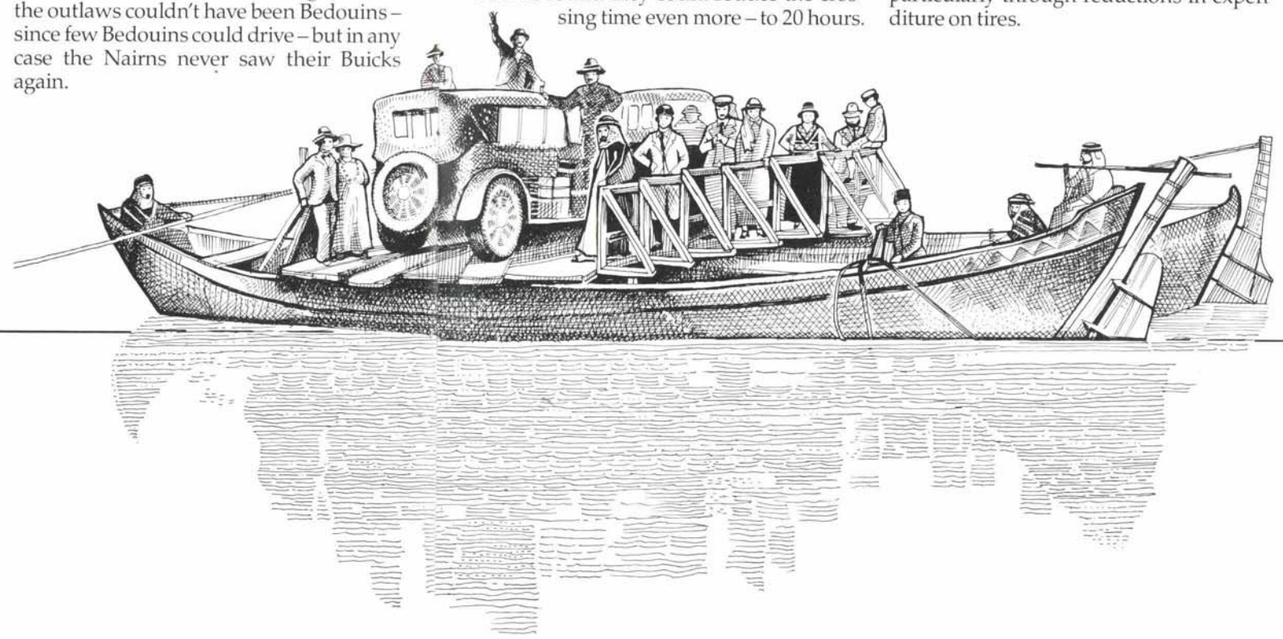
Under the contract, the Nairns agreed to carry mail between Haifa and Baghdad on a weekly basis for a period of five years – and that the time for the journey should not exceed 60 hours. For every hour in excess of that limit, a fine would be imposed. This clause in the contract, incidentally, never had to be invoked.

The preliminaries over with, the Nairns, on October 18, 1923, just a little over six months after the first exploratory trip, officially opened their service – and the first run was a smashing success. Newspapers in Britain trumpeted that thanks to the Nairns' efforts, travel in the Middle East had been "revolutionized."

Not long after inaugurating the mail service, the Nairns also began to advertise their service for passengers and freight and, realizing that if they were to develop this aspect of the business they would need more comfortable automobiles, procured four new Cadillac touring cars. With the introduction of the Cadillacs it was now possible to take seven passengers in addition to the luggage. The new cars were more reliable than the Steamers and faster than the old Buicks; even with the removal of the so-called dickey seat at the back and the installation in its place of a 16-gallon water tank, as well as the addition of two large petrol tanks on the running boards, the Cadillacs were able to shave off a couple of hours from the desert crossing.

Good cars were essential. The early route ran from Haifa to Beirut up the coastal track, from Beirut to Damascus across the mountains, and then into the desert. From Damascus the route was usually smooth; the only hazardous part of the journey was at Felluja, where the cars had to cross the Euphrates on a ramshackle bridge that buckled and swayed under their weight. Once over the river, which was 330 meters (1,082 feet) wide at the crossing point, the going was easy and the cars would glide to a stop in front of the Tigris Palace Hotel in Baghdad covered with dust but in otherwise perfect condition.

Not all the trips went smoothly, of course. In 1924, for example, a convoy of Buicks was late coming from Baghdad and Gerald Nairn and one of his associates went off from Damascus to find out what had happened. After driving some distance they came upon a disconsolate group in the desert surrounded by bags of mail – but no cars. A band of six men on camels had ambushed the little convoy and made off with the cars. Later, it was agreed that the outlaws couldn't have been Bedouins – since few Bedouins could drive – but in any case the Nairns never saw their Buicks again.

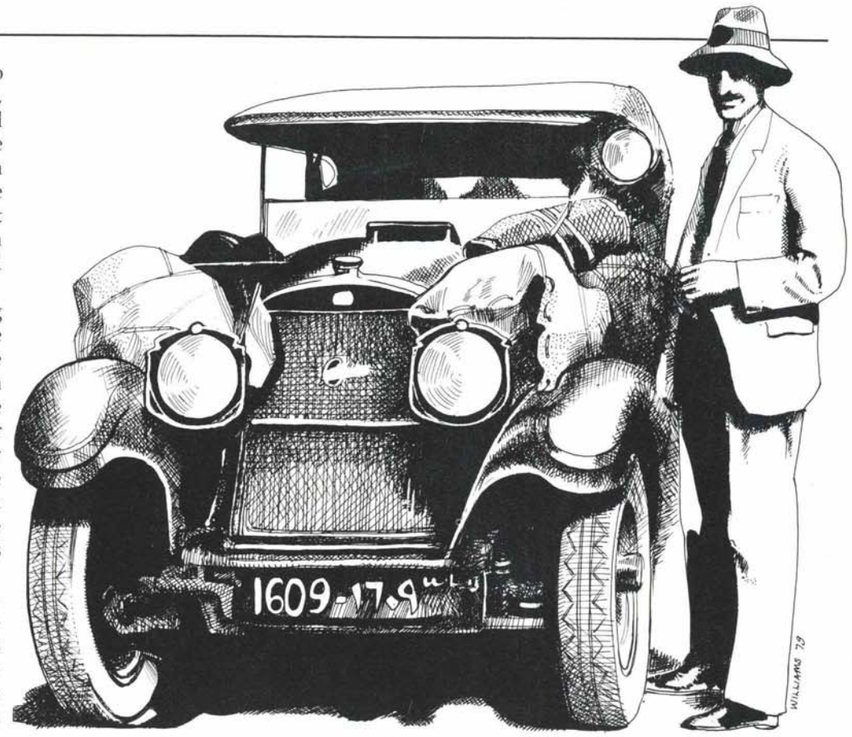


The Nairns were soon making two weekly journeys instead of one, carrying, in addition to mail and passengers, diplomatic pouches for the British, French, Italian, American, German and Russian embassies. The fact that these governments entrusted some of their secret dispatches to the Nairns is some indication of how highly esteemed the service had become.

It was not long either before the crossing had become popular with some soon-to-be famous people: H. St. John Philby, the British explorer of Arabia; writers Freya Stark and Gertrude Bell and, later, after the Nairns had introduced buses into their desert service, the famous detective-story writer Agatha Christie; she crossed the desert in one of the Nairns' buses and, in her autobiography, described how she helped Gerald Nairn pack picnic lunches for the trip.

As the Nairns' enterprise prospered, competition was inevitable, and one company, owned by the Beirut brothers Francis and Alfred Kettaneh, began to offer passengers the chance to see Palmyra when traveling between Damascus and Baghdad. The Nairns responded by cutting their time to a little over 24 hours.

By 1926 the Nairns were operating six-ton, American-made Safeway buses capable of carrying 16 passengers in comfortable, high-backed seats and almost two tons of luggage. With two drivers – which enabled the buses to drive at night too – the Nairns found they could reduce the crossing time even more – to 20 hours.



The Safeways were a great success. Though they were heavy and liable to bog down in the desert mud during the brief rainy season in the winter, and though expensive to operate, they forced the Nairns to search for ways to economize – particularly through reductions in expenditure on tires.

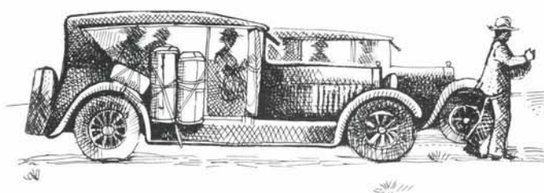
With the Buicks and Cadillacs, the Nairns had discovered, they had to change their cotton-foundation tires every 6,400 kilometers (4,000 miles). They realized that what they needed was a completely new type of tire, and eventually interested America's Firestone Tire and Rubber Company in the problem. Firestone began research into the development of a tire which could endure the heat of desert travel and focused on rayon, a new, synthetic fiber created by the Du Pont Company. Rayon seemed to offer the heat resistance cotton could not, and as the tires made with this synthetic used considerably less rubber in their manufacture, they were much cheaper to make. Eventually, a completely new type of tire came on the market, with a life expectancy of 24,000 kilometers (15,000 miles).

In other ways, though, 1926 was not an easy year for the business. All through the early 1920's, the fiercely independent tribes of southern Syria – which refused to cooperate with the French Mandate authorities – saw the Nairn Transport Company as a natural target, especially when they learned that the company was carrying gold bullion across the desert for a number of banks.

In the previous year, a band of brigands had held up a convoy carrying gold bullion, seized the cargo and mortally wounded a driver, and when other incidents followed in 1926, the Nairns decided they could no longer risk the Syrian Desert crossing. To keep the service going, however, they began to use the southerly route to Baghdad: by way of Haifa, Janin, Nablus and Jerusalem in Palestine, across the Jordan Valley to Amman, northeast to Rutba – where six 15-meter-deep wells (50-feet) dating back to the Romans provide water – and then on to Baghdad.

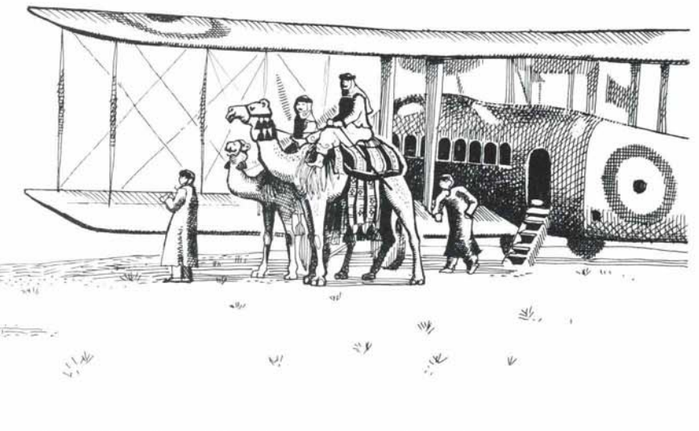
This journey was, of course, much longer and the terrain more treacherous: two extra days were added to a trip that had formerly taken only 20 hours. Tribal rebellions against the French also slowed service. But by then the company had become sufficiently well established to weather this difficult period without undue financial strain. That same year, furthermore, a competitor went into receivership and Gerald Nairn was able to arrange a takeover of assets which included several buses, a handful of Dodge cars and a half-built hotel in Palmyra. Simultaneously, the Nairns sold out their ownership of both concerns, formed a new company called the Near Eastern Transport Company, and established offices in Damascus, Beirut and Baghdad. They also sold the hotel in Palmyra and abandoned the northerly route across the desert altogether.

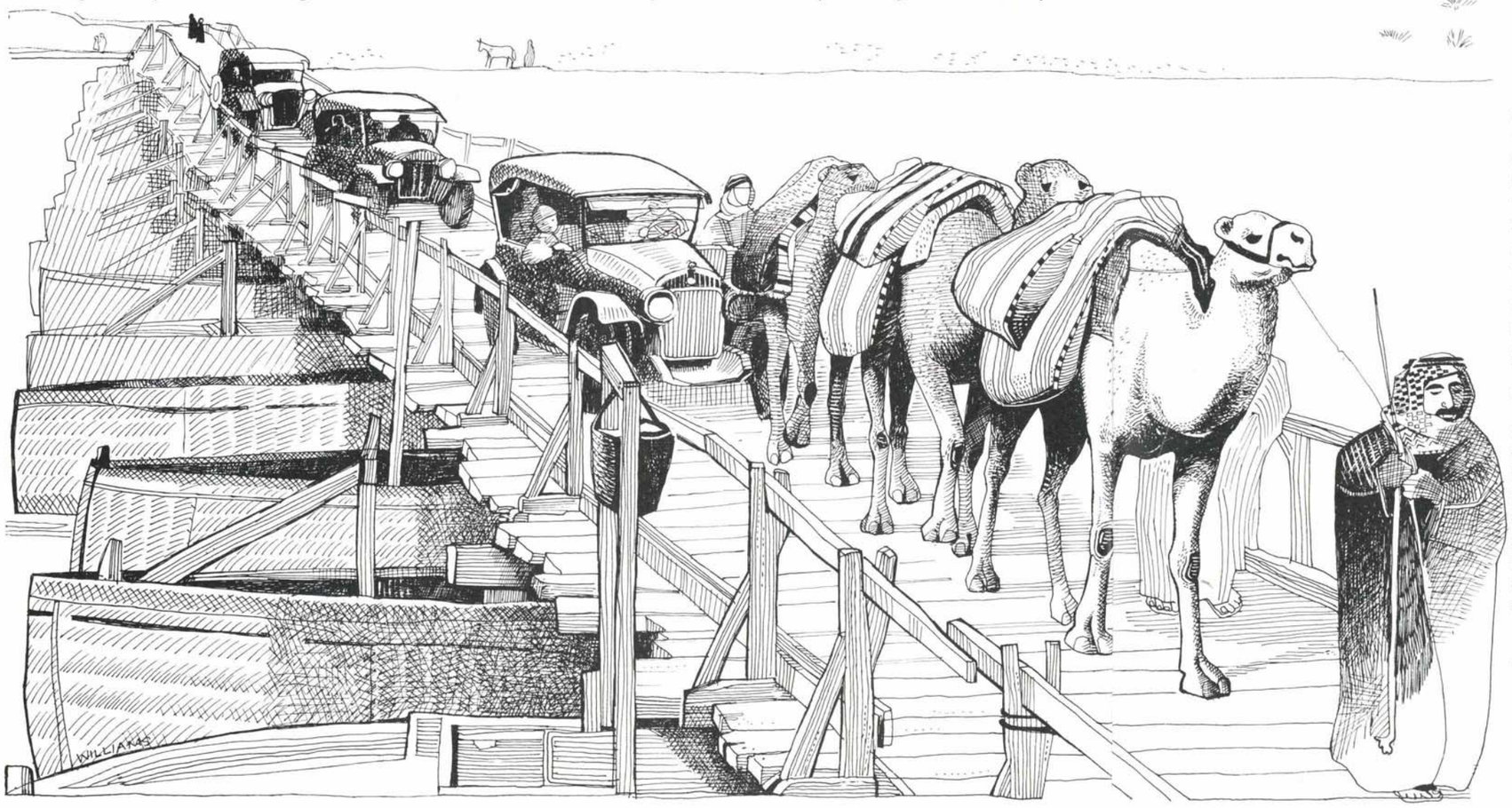
By 1934, the Nairns were literally riding high – on new vehicles called Aerocars, Buick coupes towing small coaches capable of carrying 10 passengers. They also added a four-wheeled American Car Foundry coach – capable of carrying 24 passengers and fitted with reclining seats – as well as what was then the biggest bus in the world: a Marmon-Harrington 38-seater powered by a 150-horsepower tractor driven off three axles. This 21-meter-long vehicle (70-feet), purchased in 1933, weighed 26 tons and gave passengers a smooth ride in seats modeled after those used in passenger airplanes. Riders also enjoyed such amenities as a buffet, a toilet and packed lunches.



In 1936, the transport company entered its last and most prosperous phase, a period that coincided with, and partially developed from, the rapidly growing importance of oil in the Middle East.

By then the Nairns were offering an important auxiliary service to the Iraq Petroleum Company: transportation service to petroleum production sites in the desert. Later, after IPC began to build oil pipelines from Kirkuk to al-Haditha on the Euphrates, and from there diverging pipelines to Tripoli, in Lebanon, and to Haifa, the Nairns carried hundreds of workers and technicians across the desert to the pump station sites – as well as the food required to support them.





Although the Nairns' work for oil interests in the desert involved a great deal of time and energy, they continued to keep their regular cross-desert service operating, introducing more cars, more buses and eventually trucks on the Damascus-Baghdad run. By now, passengers expected to be taken across the desert in the shortest possible time and in maximum comfort. The Nairns concurred: during the 1930s they also operated a rest house at the halfway point on the route, at Rutba, where passengers could take hot baths, tipple, or eat fried fish, Yorkshire pudding, roast beef, custards and fruits.

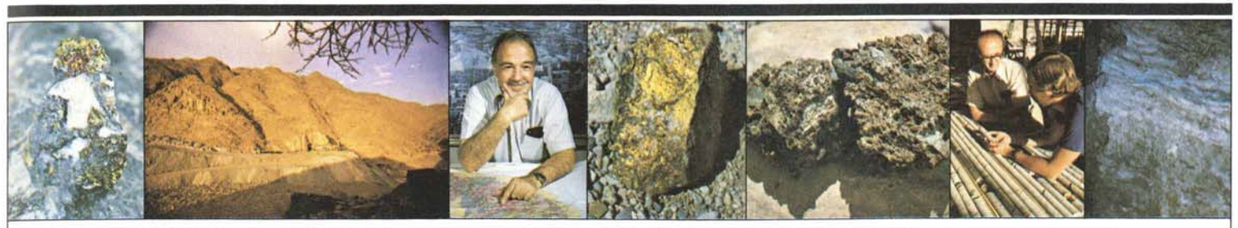
Under the Vichy French during World War II the Nairns had to endure some lean years, but in the period immediately after the war, the Nairns' company flourished. But in the post-war period the company began to decline as air transport developed, and political difficulties increased. By 1950 the Nairns had had enough; they handed over the company's shares to the employees.

Still, the cross-desert service continued until, in 1956, Iraqi customs officials imposed a customs guarantee so stiff that the firm had to cancel the Damascus-Baghdad service.

Gerald Nairn, in the meantime, had returned to New Zealand, where he died last year. Norman, after traveling to Bermuda and France, came back to Lebanon where he built a villa on the shores of the Mediterranean near Byblos. Until he died of cancer in 1968, he was a familiar figure at Beirut social gatherings.

But though the company had passed into history, the Nairn name had not. Until the 1970's, one bus the Nairns had used continued to ply the route between Beirut and Damascus with passengers for the desert bus to Baghdad, which, in turn, continued to bear the Nairn name. But even this vanished one day, and with it went the last trace of a unique chapter in the history of the Syrian desert.

John Munro teaches English at the American University of Beirut and writes for several British newspapers and magazines. Martin Love is assistant editor of Aramco World.



From left to right: traces of minerals in ore; the al-Masani mine; Hatem al-Khalidi: other minerals in rock: geologist Edward J. Neczkar and colleague.

In Saudi Arabia, another search for THE OTHER MINERALS

WRITTEN BY GEORGE W. WINDSOR, JR. PHOTOGRAPHED BY S. M. AMIN

The geologists who waded ashore at Jubail in 1933 to pioneer the search for Saudi Arabian oil have long since passed into legend. But today, in other parts of the kingdom, other pioneers have launched other searches for other minerals: silver, copper, iron and zinc, industrial minerals such as limestone, phosphates and gypsum, and – an exciting possibility – gold.

Behind the search for other minerals is the determination of the Saudi Arab government to diversify its one-crop economy and, as Shaikh Ahmed Zaki Yamani, the Minister of Petroleum and Mineral Resources, has said, provide Saudi Arabia with other sources of revenue when its petroleum reserves are depleted, and also produce raw materials for the kingdom's nascent industrial base.

No bonanzas are expected – or predicted. But since 1961, when the Directorate General of Mineral Resources (DGMR) was established, the government has invested some $450 million in mining projects and has earmarked more than $1 billion for mining in its third Five Year Economic Development Plan and by 1981 mining was progressing steadily, if unspectacularly. In January, for example, the Ministry reported the first discovery of bauxite ore, the basic element in the manufacture of aluminum.

In the southeastern areas of Saudi Arabia, for example, near the kingdom's border with North Yemen, a company called the Arabian Shield Development Company has blasted a 3,505-meter (11,500 feet) tunnel into the rock of Wadi Sa'ada in search of zinc and copper at a place called al-Masani ("the workings"), where fragments of slag from an earlier period plus pits and shafts suggest that ancient people once mined it too.

Today's techniques, of course, are quite different from those of past ages. Last year, for example, Arabian Shield had brought in mobile drilling vehicles called "Jumbos" – at $265,000 each – to drill dynamite holes into the rock face of tunnels, "scoop trams" to shovel the debris into trucks after each blast, and 20-ton dump trucks to haul it away. The rock is not ore, but spoil from the tunnel that the company is driving into the walls of the wadi to reach what the company believes will be rich veins of zinc and copper.

At this stage, the process is not actually "mining" but mine development; actual mining will not begin before 1983, according to the man who is leading the search at Wadi Sa'ada – and elsewhere. This is Hatem al-Khalidi, president of the Arabian Shield Development Company.

According to al-Khalidi, diamond-bit drilling, which began in May, 1980, has already proven enough ore to justify a 1,000-ton-per-day operation and two Canadian consulting firms hope to complete the final feasibility study – including design of an ore treatment plant – by October. If mine development proceeds on schedule, al-Khalidi said, commercial mining could start in 1983 with an expected yield of 17,600 tons of copper concentrates, 24,000 tons of zinc concentrates, 19 tons of silver and one ton of gold per year. An optimist and a trained geologist, Hatem al-Khalidi has been searching for minerals in Saudi Arabia since 1964 by flying over an area in his twin-engine Beech and following up promising areas on foot. In 1967 he eventually, discovered "gossans" – rusty mineral deposits on rocks – at Wadi Qattan and Wadi Sa'ada.

From that discovery, recalled Greg Fernette at the mine site, came further exploration showing the gossans at Wadi Qattan to be nickel bearing and the gossans at al-Masani to be copper and zinc bearing. It also reminded al-Khalidi that there were both Islamic and pre-Islamic era smelters at Wadi Sa'ada and Shi'b al-Hura in the al-Masani area.

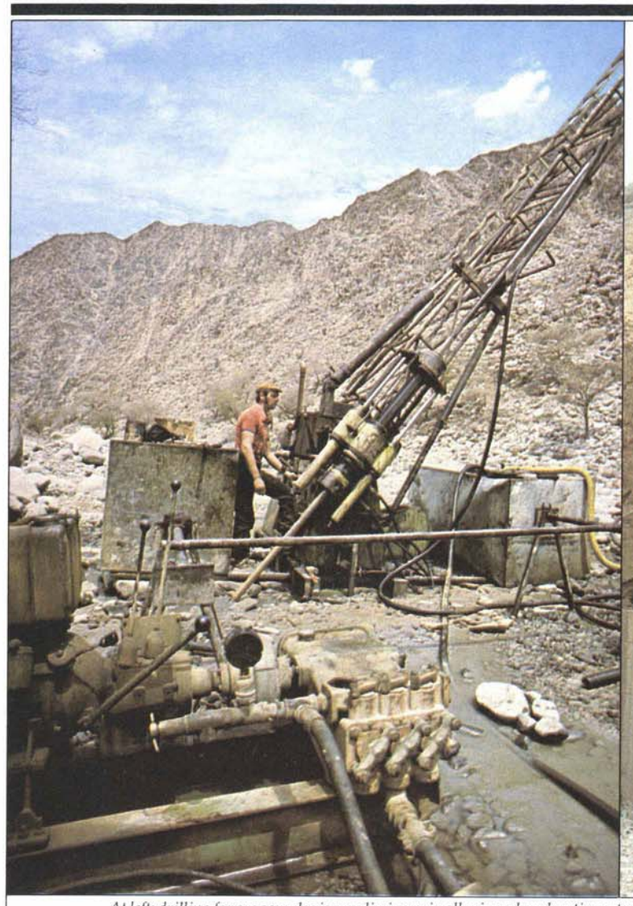
By 1971, Fernette continued, Arabian Shield had joined forces with the National Mining Company and by 1978 had drilled 46 holes which showed the existence of sulfide nickel deposits and sulfide copper-zinc deposits. As the terrain was unsuitable for deep drilling, however, the firms had to tunnel to potential ore zones to determine their content (or grade) and their size (or tonnage).

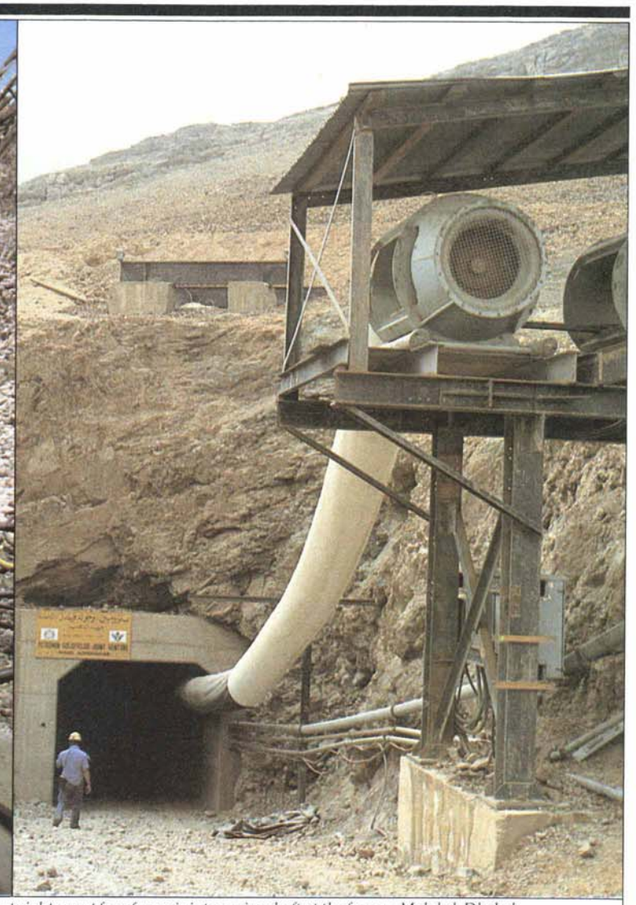
By September, the miners had completed nearly four kilometers (2.4 miles) of tunneling: a main tunnel driven 700 meters (2,297 feet) to the west and two "drifts" driven north and south – 95 meters (311 feet) beneath the ore zones so that miners could drill upwards into the ore from the tunnel. Concurrently, mining teams – up to 25 miners, plus engineers, surveyors, geologists, electricians and mechanics – drove small tunnels *into* the ore, extracted three 20-ton samples and sent them to the Colorado School of Mines Research Institute for pilot-plant metallurgical testing. They also started the diamond-bit drilling – from drilling stations in the drifts – and drilled 140 holes totaling over 13,716 meters (45,000 feet) to check reserves and locate new ore.

In addition to al-Masani, al-Khalidi has been searching for gold at Jahal Quyyam; by the spring of 1980 he had drilled 1,920 meters (6,300 feet) of holes. Then, however, he had to suspend work until the other discoveries could be evaluated.

Al-Khalidi, a Jerusalem-born American who studied geology at Michigan State University, is confident that Saudi Arabia

As part of the new minerals search Saudi Arabia has re-opened the Mahd al-Dhahab, a gold mine possibly one of King Solomon's legendary mines.





At left: drilling for ore samples is a preliminary in all mineral exploration; at right: great fans force air into a mine shaft at the famous Mahd al-Dhahab.

could be a major producer of minerals within 20 years. One reason for his optimism, he says, is that the underground mineralization and the massive sulfide deposits in the Arabian Shield area – a region in the west of the kingdom with pre-cambrian rock more than a billion years old – are very similar to those in some regions in Canada, a country rich in both minerals and petroleum.

On the other hand, al-Khalidi admits, successful mining ventures demand more than promising ore analyses. One element is labor; with no tradition of mining technology left in Saudi Arabia, Arabian Shield must import all its trained labor. Another – vital – element is water – to cool diamond drilling bits, for example – and for flotation, one of the ways by which minerals are separated from the rock and from each other. Zinc must be concentrated from the five percent in the ore to the international standard of 27 percent, and copper from 1.5 percent to 55 percent. At al-Masani, this means that Arabian Shield will need 1,892,706 liters (500,000 gallons) a day to process the 1,000 tons of ore they hope to extract daily – the reason the company conducted a hydrological survey and engaged the Arabian Drilling Company to drill test wells.

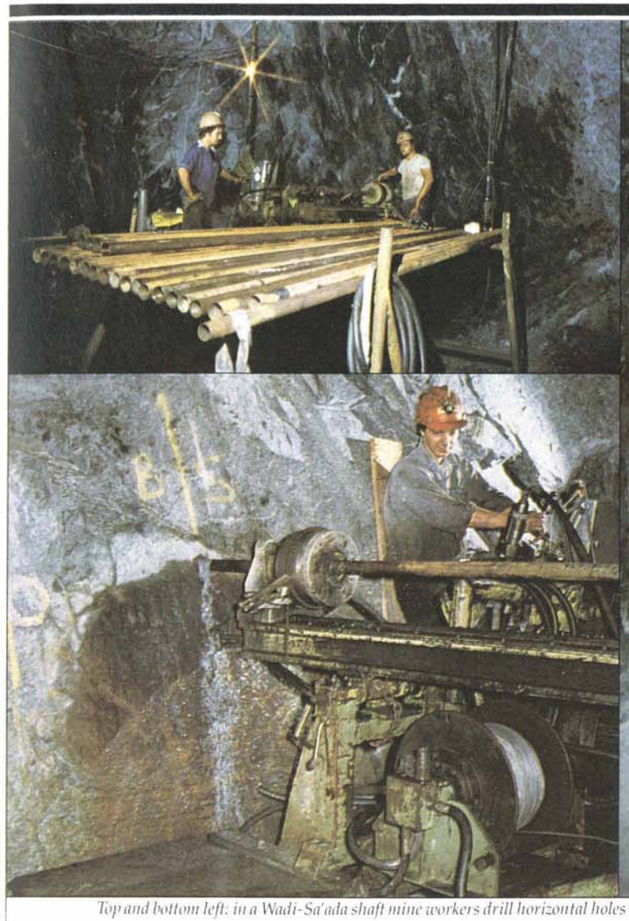
A third element is transportation – inward with supplies, outward to the port of Jizan (See *Aramco World*, September-October 1980) with the metal concentrates. The company has already bulldozed and graded more than 100 kilometers (60 miles) of roads to link the mining site at al-Masani with the paved road network, but it's still another 240 kilometers (150 miles) to the coast.

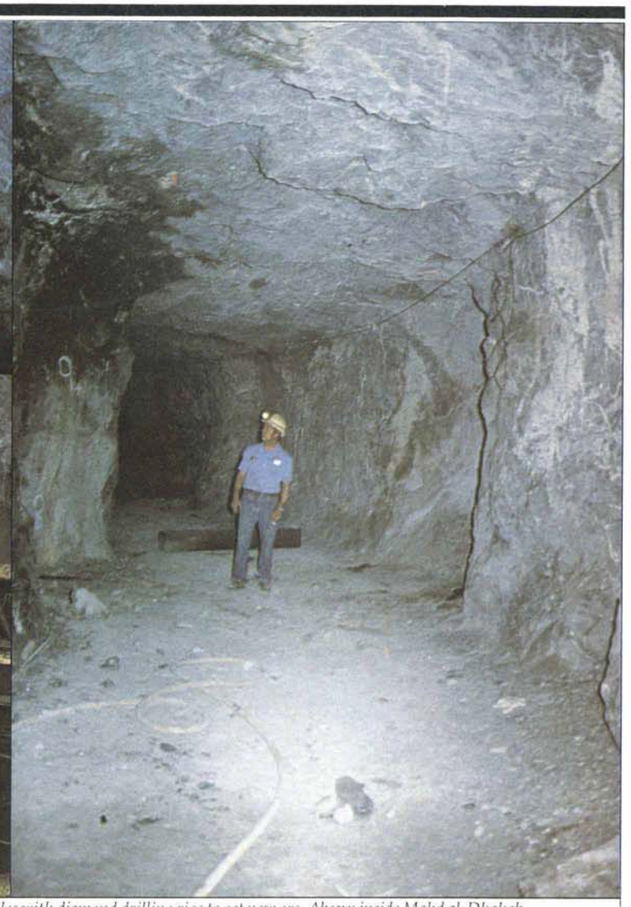
According to 1980 estimates, the ores at Mahd al-Dhahab may contain about an ounce of gold per ton of rock. This compares with a half-ounce-per-ton yield from some South African mines, and the two-tenths-of-an-ounce yield expected from a vein in California that an American mining company decided to exploit last year. If the estimates are correct, this ancient mine could yield as much as 3,703 kilograms (120,000 ounces) a year.

Even if the estimates are not close, mining operations at Mahd al-Dhahab still might be worthwhile. Estimates made for the DGMR suggest that in addition to gold, the ore could produce up to seven tons of silver, 1,000 tons of copper and 2,500 tons of zinc.

For the last four years, Saudi Arabia – along with The Sudan – has also been searching for minerals in the Red Sea, an attempt to exploit a rare geological situation.

According to geologists, the entire Arabian Peninsula is slowly rotating counter-clockwise, and – over geological lengths of time – gradually closing the Strait of Hormuz, narrowing the Arabian Gulf and widening the Red Sea. As a result of this tectonic movement, deep rifts have opened at the bottom of the Red Sea through which mineral components from within the earth





Top and bottom left: in a Wadi-Sa'ada shaft mine workers drill horizontal holes with diamond drilling rigs to get new ore. Above: inside Mahd al-Dhahab.

are being spewed into the seawater by volcanic processes.

In 1948 the first of these 18 known "deeps" – where the seawater is very salty, mineral-rich and hot – was discovered by the Swedish survey vessel *Albatross*. Since then, scientists have learned that the minerals – precipitated from the seawater near the deeps – tend to collect in the seabottom mud; mud samples show the presence of zinc, copper, silver, lead, cadmium and cobalt, plus traces of other minerals.

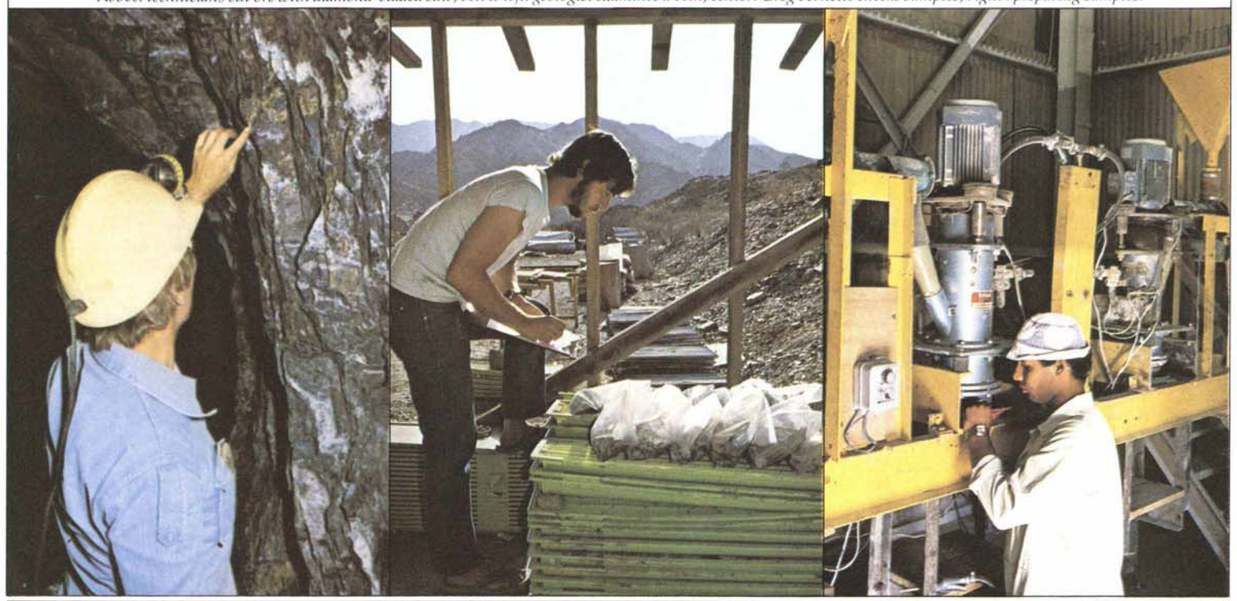
Recognizing the potential value of this discovery, Saudi Arabia and The Sudan began, in 1976, to study and map the Red Sea, and eventually focused on the Atlantis II Deep, an area of nearly 65 square kilometers (25 square miles) west of Jiddah, halfway between Saudi Arabia and The Sudan. According to the studies, the muds in the Atlantis II Deep contain some 2.5 million tons of zinc, half a million tons of copper and 9,000 tons of silver, among other things, with a potential value in the billions of dollars.

Then there's the matter of profitability; with $12 million already spent on exploration, development, labor and infrastructure, will the mine be profitable? Al-Khalidi thinks it will, if metal prices – of about $.95 a pound for copper and $.40 a pound for zinc – remain stable. It's a big "if" – metal prices fluctuate wildly, as silver showed in 1980 – but in April, 1981, prices *were* holding; if they continue to do so, al-Khalidi estimates profits of between $7 million and $20 million, depending on ore quality and the world market when the mine goes into production.

Another exciting possibility is the centuries-old Mahd al-Dhahab ("Cradle of Gold"), about 290 kilometers (180 miles) northeast of Jiddah, the site, according to legend, of one of the fabled King Solomon's Mines. Here, under license, a Saudi-British joint venture – Petromin and Consolidated Goldfields of London – has already collected more than 13,762 cubic meters (18,000 cubic yards) of ore for analysis from a 1,538 square kilometer (615 square miles) tract, pronounced the finds "small but rich", and established a mining camp less than a mile from the original Mahd al-Dhahab mine.

The prospect of gold is always exciting and at Mahd al-Dhahab the excitement is stronger still. Though no one can prove that it *was* one of King Solomon's Mines, it is by no means unlikely. Its ore has been mined extensively during at least three periods: about 950 B.C. – in the time of King Solomon; from A.D. 750 to 1150, during the Abbasid Caliphate; and from 1939 to 1954, when nearly 28,350 kilograms (a million ounces) of gold were extracted.

Not much is left of the past ventures except a few buildings and a flooded shaft marking the search by a firm called the Saudi Arabian Mining Syndicate – the firm founded by the famous Karl Twitchell – but in the fourth attempt to find gold at Mahd al-Dhahab, the new mining company has already set up some prefabricated buildings near the new mine for some 30 miners, and in a few years will build an entirely new



Above: technicians cut ore with diamond-bladed saw; below left: geologist examines a vein; center: Greg Fernette checks samples; right : preparing samples.

community among the region's hills, acacia trees and brush. Plans call for an expenditure of $60 million to provide a new processing plant – to extract gold from the ore – and to build housing, water pipelines, a power plant and communications equipment.

Saudi-Sudanese studies in the past two years have attempted to determine the cost and feasibility of extracting minerals from the sea-mud and it is already clear that there will be problems. One is that the deposits lie at depths of 1,981 meters (6,500 feet), another is that there would be an immense volume of mud to process: even when dried and free of salt more than 100 million tons of material would have to be processed to extract minerals.

A third problem is that extracting minerals from the mud might be technically difficult because the mud is so fine. More that half the mud consists of particles smaller than .203 millimeter (.008").

Governments in Saudi Arabia and The Sudan are also concerned about the possible effect of mining on the plant and animal life of the Red Sea (See *Aramco World,* September-October 1980). This was the main point of a "pre-pilot" test of probable mud-mining technology carried out in March 1975 – and that itself followed intensive physical, chemical and oceanographic studies. Using a 2,195-meter (7,200 feet) pipe string with a suction head, a converted oil-drilling ship was used to mine 15,000 tons of Atlantis II muds. Once on board, the mud was passed through a flotation process that separated the 95-percent waste product from the useful five percent of minerals, chemicals and water.

The waste mud is the cause of the ecological concern: siltation cuts off light and oxygen from benthic and bottom-dwelling creatures and can prevent the growth of plankton on which, ultimately, much ocean life depends. In the pre-pilot test, the waste – or tailings, as miners call it – was pumped down a 1,300-foot outlet pipe with enough force to send the jet down 1,300 feet on its own, there to be diffused in all directions, while, in space, a NASA satellite monitored the plumes that returned to the surface.

Initially, the diffusion pattern suggests that mining of the mud would not pose any ecological problems, but to be absolutely certain, the governments' scientists have identified certain trace elements in the tailings that can be tracked and studied over a period of years to gauge possible long-term effects.

The net results of these extensive studies suggest that extracting metals from minerals from the Red Sea *is* feasible; of four companies given mud samples, and using four different extraction processes, two have reported that metals can be profitably extracted, and the environmental tests have shown no immediate threat. The governments, therefore, will probably proceed with further tests – such as tracking the trace elements in the waste mud from the Atlantic II Deep – and, if there are no negative results, authorize a pilot mud-mining project in 1983.

Geolgist inspects diamond-drill core sample.

On land, the DGMR has signed contracts with a bevy of international agencies and corporations in its efforts to survey and map the kingdom's geological features and to investigate, inventory and help develop, in an orderly way, the mineral resources. Included so far are the United States Geological Survey, the French *Bureau de Recherches Geologiques et Minières,* Rio Tinto Finance and Exploration, the British Steel Corporation, the Japanese Geological Mission, Minatome, a French uranium company and a Royal Dutch Shell company. British Steel, for example, is carrying out feasibility studies on an iron ore deposit at Sawawin, about 96 kilometers (60 miles) southwest of Tabuk where, unfortunately, research indicates that a 300-million-ton body of ore contains only about 40 to 45 percent iron. That percentage is too low to allow the ore to be used directly in the carbon steel facilities planned for Jubail and Yanbu, but might be high enough to provide an internal source of iron which, by massive mining or intermediate enrichment, might be made useful.

Elsewhere, a Swedish firm has taken out an exploration license on the Nuqra area and is now carrying out the underground work to prepare a feasibility report on the small but high-grade deposits of silver, gold, zinc and copper it has found. Mining could start there in 1984.

There are promising deposits of the other minerals elsewhere, too: at Jabal Sayid, where copper deposits seem to contain 40 million tons of 1.7 percent ore; at al-Zabira where the bauxite is and at Khaniqiya, where deposits of zinc – with probable reserves of 15 million tons of better than five-percent ore – might be mined by cheap open-cast methods, if ecological considerations permit. And at Ghurayya in northern Saudi Arabia there are deposits of columbium, tantalum and uranium, for which new extraction methods will have to be developed.

The government, of course, would like such projects to be profitable, but developing its other minerals will in any case result in advantages that balance sheets cannot fully measure. The mineral projects, for example, are part of a larger plan to encourage the growth of local industry and reduce the need for imports – and the accompanying cash out-flow.

Thus, the DGMR is helping local companies locate deposits of ornamental stone, clay, limestone, gypsum and various aggregates – all raw materials for the kingdom's burgeoning construction industry – and the Red Sea Commission is discussing mineral processing facilities in the new industrial center of Yanbu – to produce zinc, copper, silver, cobalt, gypsum and cadmium sulfide in commercial quantities.

Further benefits, almost incidental but nonetheless valuable, include better mapping of the Red Sea and the western part of the kingdom, and the training and experience provided to young Saudi geologists and workers in related fields.

For all those reasons, Saudi Arabia is demonstrating its commitment to the other minerals by offering foreign companies, such advantages as five-year tax holidays, interest-free capital loans and solid back-up from the DGMR and its advisers – a long range commitment appropriately, if accidentally, suggested by the fact that the first producing mine of the new age of mining will be the Mahd al-Dhahab, three millennia after it was first opened in the time of King Solomon.

George W. Windsor, Jr., an instructor of English at the University of Petroleum and Minerals in Dhahran, Saudi Arabia, writes regularly for the Arab News, *an English language daily newspaper published in Jiddah.*

"...Gently down the stream..."

Regatta on the Nile

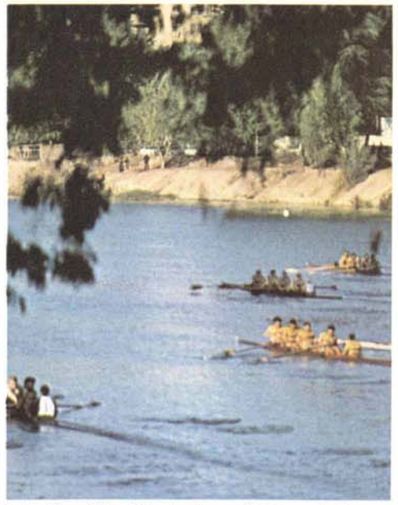
WRITTEN BY MARTIN LOVE
PHOTOGRAPHED BY MARTIN LOVE AND SUSAN SIRAVO

Regatta on the Nile

In Egypt last December, on a bridge across a channel of the Nile, Bob Ernst, assistant rowing coach at the University of Washington, was talking about the upcoming 2,000-meter race in which a top-flight American crew was pitted against an Irish crew and four Egyptian crews in one of the final races of the annual Nile International Rowing Festival. "We've got this one easily," Ernst said, just minutes before the race began.

He wasn't the only one to think so. Dick Erickson, the head coach, had already told his oarsmen that the Egyptians posed no threat in the "fours" – a race of four-oared shells. "They're going to start fast and wear themselves out before they get halfway down the course. Just take it easy, hang in there and stay close."

On that confident note, the Washington crew started the race and for a while it seemed that Ernst and Erickson were dead right. The four oarsmen from the Arab Contractors, thought to be the best Egyptian crew in the race, had taken the lead at the start, and though they were still ahead



In the "fours," Arab Contractors paddle toward victory.

at the half-way mark, Ernst and Erickson were still confident as they jumped into a car to follow the crews to the finish line.

By the time they got there, however, their assurance had evaporated. Instead of wearing themselves out, the Arab Contractors, in the most dramatic race of the regatta, had scored a signal victory over one of the formidable American crews in the regatta.

It wasn't the Egyptians' only victory, either. In Luxor on December 23, a few days before the races in Cairo, two Egyptian scullers – oarsmen racing alone in small shells called "sculls" – placed first and second, and an Arab Contractors entry in the "eight" race beat all the European crews. Finally, in the "pair" finals in Cairo, an Arab Contractors entry beat both a Belgian and a Trinity College crew.

For the Egyptians watching these races from both banks of the Nile, those victories were exciting. At Luxor, for example, some 30,000 people jammed onto the embankments were so jubilant when an Egyptian crew briefly held the lead in an "eight" race that they surged down the banks into the river itself, screaming their support. Though relatively unimpressive in terms of world competition, these triumphs meant that Egypt's nine-year effort to enter and encourage international rowing was at last beginning to yield results and restore rowing in the country where, 33 centuries ago, in the reign of Pharaoh Akhnaton, ancient oarsmen began to compete in a royal regatta known as the "Festival of the Oars."

That, most probably, was the beginning of rowing as a sport, but in the West it was not until the 14th century that it appeared again – on the Grand Canal in Venice. Later, in the early 18th century, professional oarsmen, who ferried passengers across the Thames near London, apparently competed in races between the Chelsea and London bridges. Racing by amateurs got started in Britain around 1829, the year of the first Oxford-Cambridge boat race. At about the same time, amateur rowing competitions started in America, and in 1900 rowing was accepted as a sport at the Olympic Games. Since then, the United States, Germany and Great Britain have won most of the medals and pioneered most of the technical innovations that have made shells faster and lighter and have improved the efficiency of the rowing stroke. One such innovation was the sliding seat created by an American, J. C. Babcock, in 1857.

In Egypt, where it began, rowing had long since disappeared as a sport when, during World War II, British oarsmen apparently began to build and race shells on the Nile, and some Egyptians began to do the same. Eventually, as a result, the Egyptians formed several rowing clubs, six of which participated in the 1980 festival – Masry, Cairo Police, Suez Canal – Ismailia, Alexandria Police, Port Said Police and Police Federation – and one of which emerged as a strong competitor: the Arab Contractors.

Insofar as Egypt has a national team, the Arab Contractors comprise it. Organized in 1960 – with the sponsorship of Osman Ahmad Osman's giant construction firm (See *Aramco World*, March-April 1974) – the Arab Contractors Club is at once the oldest and best of Egypt's rowing teams. Its crews, in the 1970's, rowed on the University of Washington's home waters near Seattle, competed three times in the prestigious Henley Royal Regatta in England and rowed at the Henley Canadian Regatta in Toronto. The club also led the move to organize the first Nile rowing festival back in 1971, at which Egyptians, for the first time, competed against international crews.

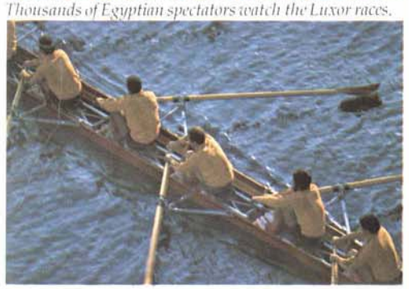
That year, only Oxford and Cambridge Universities of England sent crews. But in 1972, when the Oxford and Cambridge crews returned to compete, they found crews from Harvard and Yale there too. By 1974, German and Italian crews had also begun to participate, and since then the festival has grown in stature each year. As Dick Erickson said last December when he brought his University of Washington oarsmen to Egypt for the fourth consecutive year, "The festival is far and away one of the most unusual athletic contests I've ever attended."

"The Nile is just a spectacular setting for rowing," he continued. "It's one heck of an opportunity for young student athletes to be here, a priceless experience to visit Egypt under these circumstances."

Even more indicative of the current stature of the Nile competitions is the fact that the U.S. Olympic Committee provided funds to send American oarsmen – and two oarswomen – to Egypt; these crews were selected to represent the United States at the 1980 Olympic Games in Moscow, but couldn't go because of the U.S. boycott of the Olympics. The U.S. national "eight" which competed in Egypt in December had been beaten only once – by the top East German "eight" which won a Gold Medal

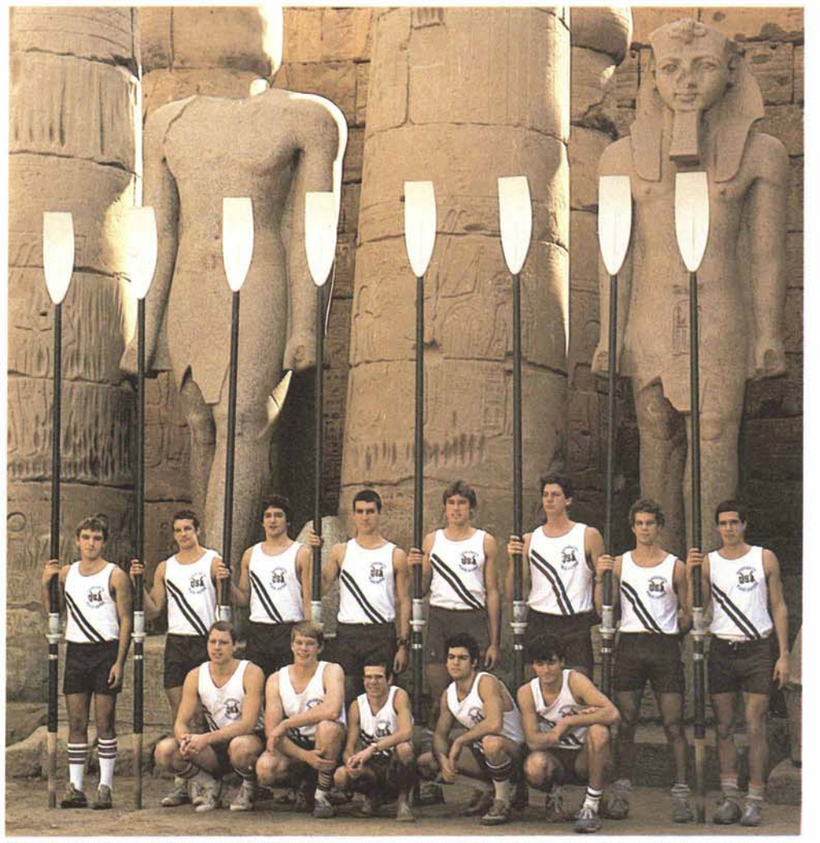
A contingent of rowers from West Germany, followed by other teams, marches from the Temple of Luxor towards the Nile race after ceremonies opening the regatta.

Thousands of Egyptian spectators watch the Luxor races.



At Cairo, oarsmen in an "eight" reach for the next stroke.

Arab Contractors celebrate a victory at their boathouse.



Coach Dick Erickson led University of Washington athletes almost halfway around the world to the annual regatta.

in Moscow. As expected, this crew won its races in Egypt.

Other Olympic-level contenders – and the first two women in the Nile Rowing Festival – were Carrie Graves, the current coach of the Radcliffe-Harvard women's crews in Cambridge, Massachusetts, and her rowing-mate, Peggy McCarthy. Both women, had the U.S. boycott not been imposed, would have gone to Moscow last summer as part of the national rowing team, and at Cairo and Luxor they raced their "pair"– a two-man shell – against two younger Egyptian women representing El Masry Rowing Club: Hanan Shahwan and May Ahmed Aly.

The American women won easily since both Graves and McCarthy are much larger than the Egyptian women – a decided advantage in rowing. (Graves, for example, weighs 185 pounds and stands just over six feet tall). Furthermore, they have been rowing together for almost a decade; both rowed when they were students at the University of Wisconsin and, because McCarthy works as an engineer in the Boston area, often train together on the Charles River.

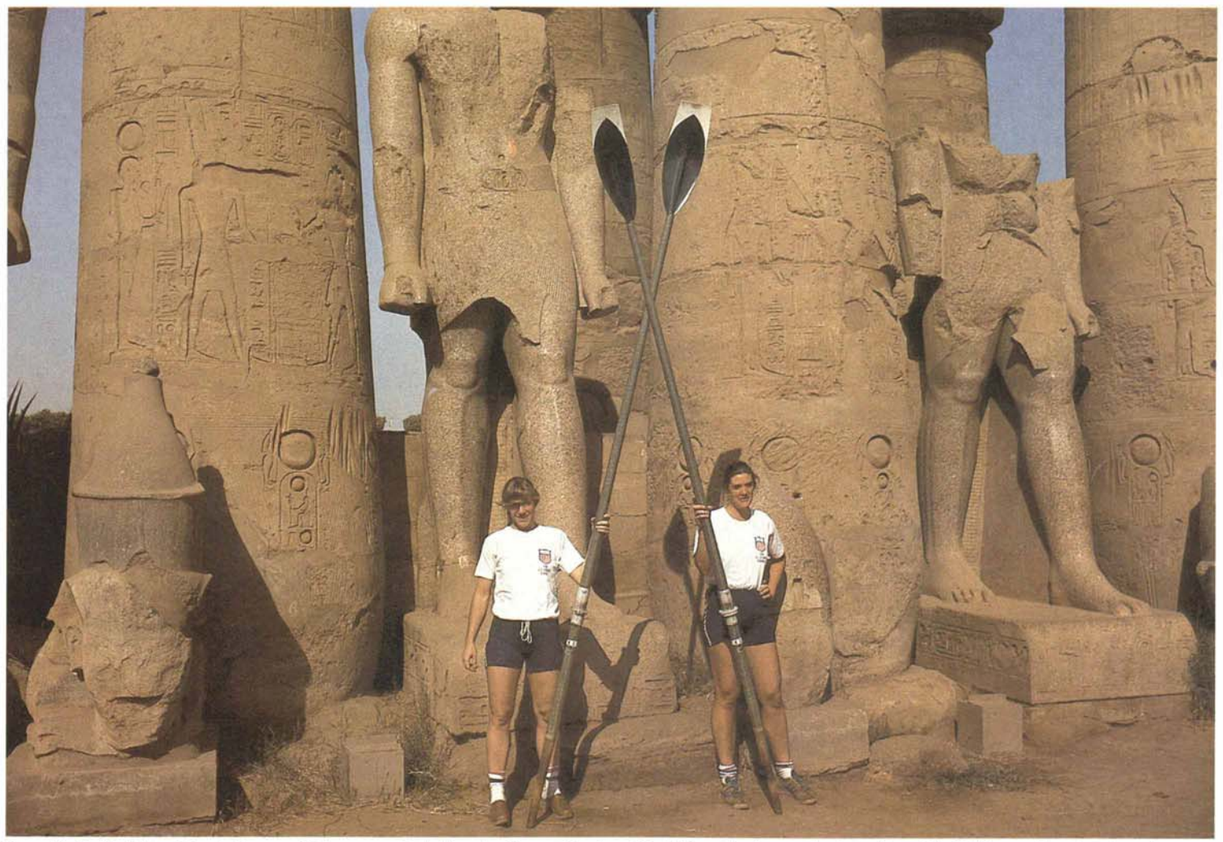
Still, the Egyptian pair rowed valiantly and only lost by a couple of lengths. After the race in Cairo, Graves said she was impressed with the spirit of Aly and Shahwan. "They've got a future if they stick with it," she said.

Actually, the rowing festival included much more than rowing. The highlights were, naturally, the two separate regattas – the one at Luxor and the one at Cairo concluding with the finals on December 28. But the opening ceremonies at Luxor on the 23rd were also memorable, with Egyptian boys and girls in costume, brass bands and dignitaries assembled within the famous Temple of Luxor in the shadows of stone effigies, tall columns and walls festooned with ancient Egyptian hieroglyphics.

When they weren't resting, practicing or racing, the oarsmen also attended banquets, visited the monuments, explored the tombs of the pharaohs in the Valley of the Kings, and enjoyed performances of local folk dancing and music. In Cairo, the University of Washington oarsmen – on the day of the finals – drove out to the pyramids at Giza and scrambled to the top of the Great Pyramid of Cheops.

As for the regattas themselves, the European and American oarsmen found them challenging – and not just because of the competition. In Luxor, for example, they had to use some old racing shells that were much harder to row than the shells they raced back home, and harder to "set up" in the water. Oarsmen must practice long and hard to learn the characteristics of individual shells so that, during a race, they'll be relatively stable in the water. Old, wooden shells, after much use, also lose their stiffness and tend to twist when rowed hard, making it that much harder for oarsmen to row efficiently.

For oarsmen, a change of shells is serious. Though spectators may think rowing is an easy sport to master, it isn't. To compete at rowing demands dedicated sustained efforts by a crew, and by individuals, to condition the muscles, heart and lungs; indeed the exertion required by a good oarsman in a 2,000-meter race involves the use of more muscles, and more energy, than that of any other athlete. In each minute of the five or six minutes it takes to



Peggy McCarthy, left, and Carrie Graves, right, cross oars in the Temple of Luxor. Members of the U.S. national team, they later defeated the El-Masry club girls in "pairs."

RACE RESULTS: NILE INTERNATIONAL ROWING FESTIVAL

Pair with Coxswain (Men)
1. U.S.A. – National Team
2. U.S.A. – Charles River Rowing Club, Cambridge, Mass.
3. W. Germany – Marktheidenfeld Rowing Club
4. Egypt – Arab Contractors
5. Belgium – Union Nautique Rowing Club
6. England – Worcester College, Oxford University

Sculls (Men)
1. Egypt – Cairo Police Rowing Club
2. Egypt – Suez Canal Rowing Club, Ismailia
3. W. Germany – Straubing Rowing Club

Eights (Men)
1. U.S.A. – National Team
2. U.S.A. – University of Washington
3. U.S.A. – Harvard University
4. Egypt – Arab Contractors
5. Belgium – Vlaamse Rowing Club
6. W. Germany – Marktheidenfeld Rowing Club

Pair (Women)
1. U.S.A. – National Team
2. Egypt – El-Masry Rowing Club

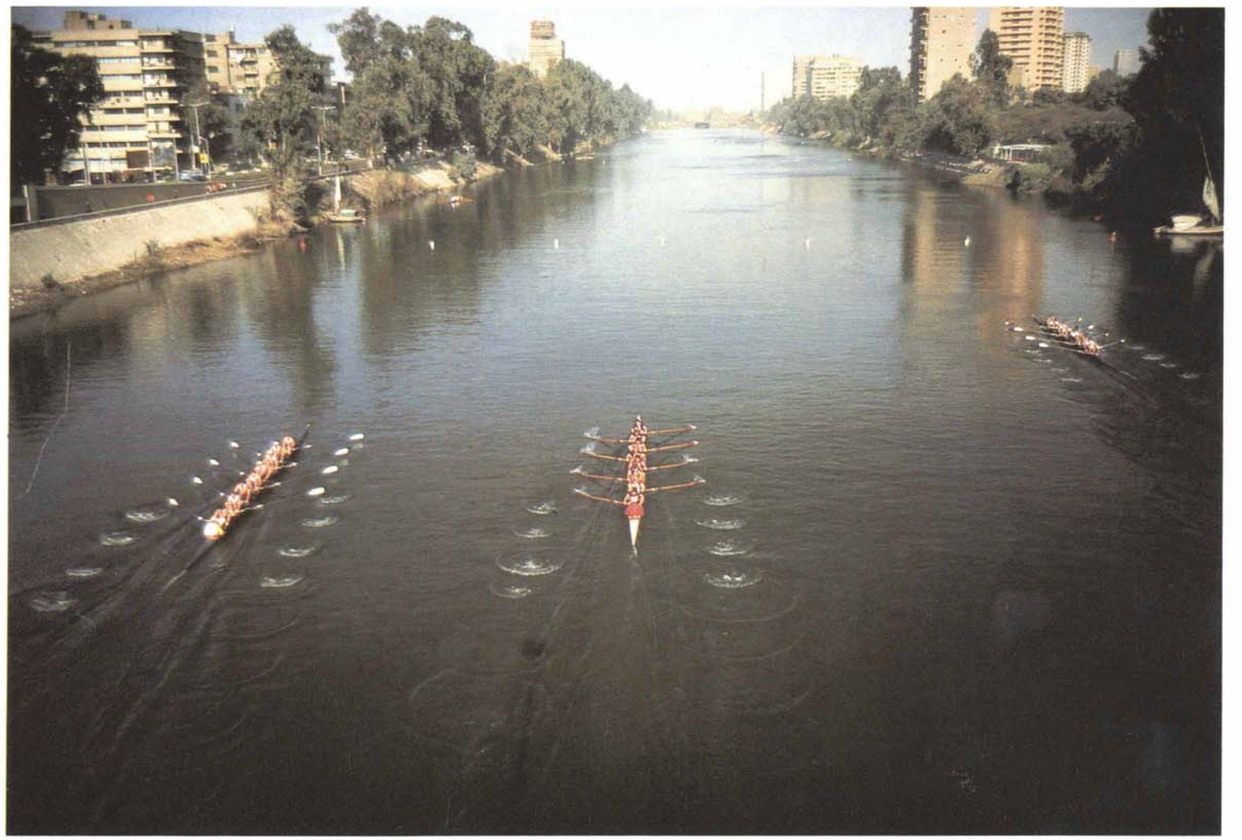
Pair with Coxswain (Men)
1. U.S.A. – National Team
2. W. Germany – Marktheidenfeld Rowing Club
3. U.S.A. – Charles River Rowing Club, Cambridge, Mass.
4. Egypt – Arab Contractors
5. Belgium – Vlaamse Rowing Club
6. Ireland – Trinity College of Dublin

Harvard crews failed to win any race during the regatta.

Four with Coxswain (Men)
1. Egypt – Arab Contractors
2. U.S.A. – University of Washington
3. Egypt – El-Masry Rowing Club
4. Ireland – Trinity College of Dublin
5. Egypt – Suez Canal Rowing Club, Ismailia
6. Egypt – Port Said Police Rowing Club

Scull (Men)
1. Egypt – Suez Canal Rowing Club, Ismailia
2. W. Germany – Straubing Rowing Club
3. Egypt – El-Masry Rowing Club
4. Egypt – Arab Contractors
5. Egypt – Cairo Police Rowing Club
6. Egypt – Alexandria Police Rowing Club

Eights (Men)
1. U.S.A. – National Team
2. U.S.A. – University of Washington
3. U.S.A. – Harvard University
4. Egypt – Arab Contractors
5. Egypt – Cairo Police Rowing Club
6. Belgium – Vlaamse Rowing Club



On a narrow section of the Nile, between an island and the western part of the city, competitors in Egypt's International Rowing Festival race near the finish line.

Head coach Erickson, at left, directs preparations at Luxor before oarsmen launch their shell on the Nile.

Egyptian regatta officials man starting boat in Luxor.

Arab Contractors' stamina at Cairo jolted Bob Ernst.

Arab Contractors' "eight" beat all other Egyptian crews.

complete a race, an oarsman inhales more than twice the air an unconditioned person inhales while exercising, and each member of the crew must use – effectively – almost every muscle in his or her body: the arms to pull the oar at the "catch," the start of the stroke; the wrist to feather the oar as it leaves the water; the back to maintain posture and help power the oar and the legs to provide the driving force as the curved, slightly concave blade bites and grabs the water.

The exertion required to do all this at the greatest possible speed – most races are rowed at an average rate of 35 strokes a minute – exhausts even the best trained oarsman or oarswoman. As a result, rowing is a painful sport – perhaps one of the most painful. The oarsman – or oarswoman – needs to have the endurance of the long-distance runner and the strength of a weight lifter. Unlike the runner, however, or the weight lifter, who is accountable to no one, the rower – if he or she falters in the middle of a race, or breaks the rhythm – can lose a race for the whole crew since one idle oar instantly disrupts the others. Indeed, rowing well is maintaining perfect timing and coordination and rowing in an unfamiliar shell makes that timing and coordination that much harder to capture and maintain. It's the equivalent of top tennis players switching rackets on the eve of a crucial doubles match.

As in all rowing regattas, the last and most important race at the Nile festival was between the men's "eights." Rowed late in the afternoon as the sun went down and long shadows fell across Nile waters at Cairo, this race almost became a spectacular win for the University of Washington "Huskies," but turned into a devastating defeat.

At the halfway mark, the Huskies had a half-length lead on the older, stronger and more experienced U.S. national crew, the only other crew still in contention, and had they maintained their strength and stroke, they could have won. But with 100 yards to go, the Huskies still holding a 10-yard lead, the bigger U.S. national crew began to gain. At the finish line, the Washington crew was beaten by a few painful feet.

Later, back at the boathouse, one Washington oarsman exclaimed as he stepped wearily from his shell: "We had them. We really did, I don't know what happened." Dick Erickson had an answer: "There will always be someone bigger and stronger than you are," he told his oarsmen.

This, as the Egyptians showed in the "fours" race, is what makes regattas interesting – and keeps the Egyptians bent to their oars.

It isn't the only factor, of course. Another is the fact that Egypt is one of only two Muslim countries to be represented in the Paris-based Fédération Internationale des Sociétiés d'Aviron (FISA), the international rowing authority. Turkey is the other.

This is only logical. Lacking perennial lakes and rivers, most of the countries in the Arab East have virtually no way to master the sport and thus no interest in it. On the other hand, Ernst said, Saudi Arabia recently ordered more than 100 sophisticated plastic shells from West Germany, and it's possible that other countries in the Arab world will become increasingly involved in rowing – particularly those countries that can afford to support oarsmen who must buy the expensive equipment required to be competitive.

For the present, however, Egypt is the hope of the Arab East in rowing. Bob Ernst says that Egypt could have world-class crews if they could get the coaching required to train local talent.

The ultimate test is, of course, the Olympics, and so far Egypt has not sent crews to the games. But according to 'Abd al-Mun'im, assistant secretary of the Rowing Federation of Egypt, there is a definite "possibility" that in 1984 the Egyptian oarsmen of the Nile will go to Los Angeles to compete in sport launched by their ancestors 3,300 years ago.

Martin Love, a former oarsman who rowed racing shells at the University of North Carolina, is now assistant editor of Aramco World.