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Ferguson

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FEBRUARY 1962

NINEVEH

objects in the entire gallery of animal art, is "The Dying Lioness" from Nineveh, now in the British Museum. The observer feels a thrust of immense power in this work as, mortally wounded and paralyzed by arrows, the lioness raises herself on her forepaws in final, agonized defiance.

Tableaux like these adorned buildings throughout the Assyrian Triangle, the natural fortress formed by the confluence of the Tigris and Zab Rivers, the base from which a fierce, aggressive people overran most of the civilized world from the Persian Gulf to the Nile.

The first Nineveh scholar was Sir Austen Henry Layard, amateur antiquarian anxious to find evidence of the city mentioned with grim maledictions in the Old Testament. Layard was 22 when he left London in 1839 for a job in Ceylon. Fortunately, he broke his journey to explore the Middle East, and, with financial assistance from the British consul in Constantinople, began to dig along the Tigris in 1845. How Nineveh was retrieved from the rubble of two-and-a-half millennia is the story of Layard and his lions.

Across the Tigris from modern Mosul he made one of the most dazzling strikes in the history of archaeology. The spades of his workmen turned up the foundations of great buildings, giant stone figures of winged lions and bulls, thousands of feet of carved alabaster friezes, countless artifacts of bone and metal, and the collection of "books" in the Library of Ashurbanipal.

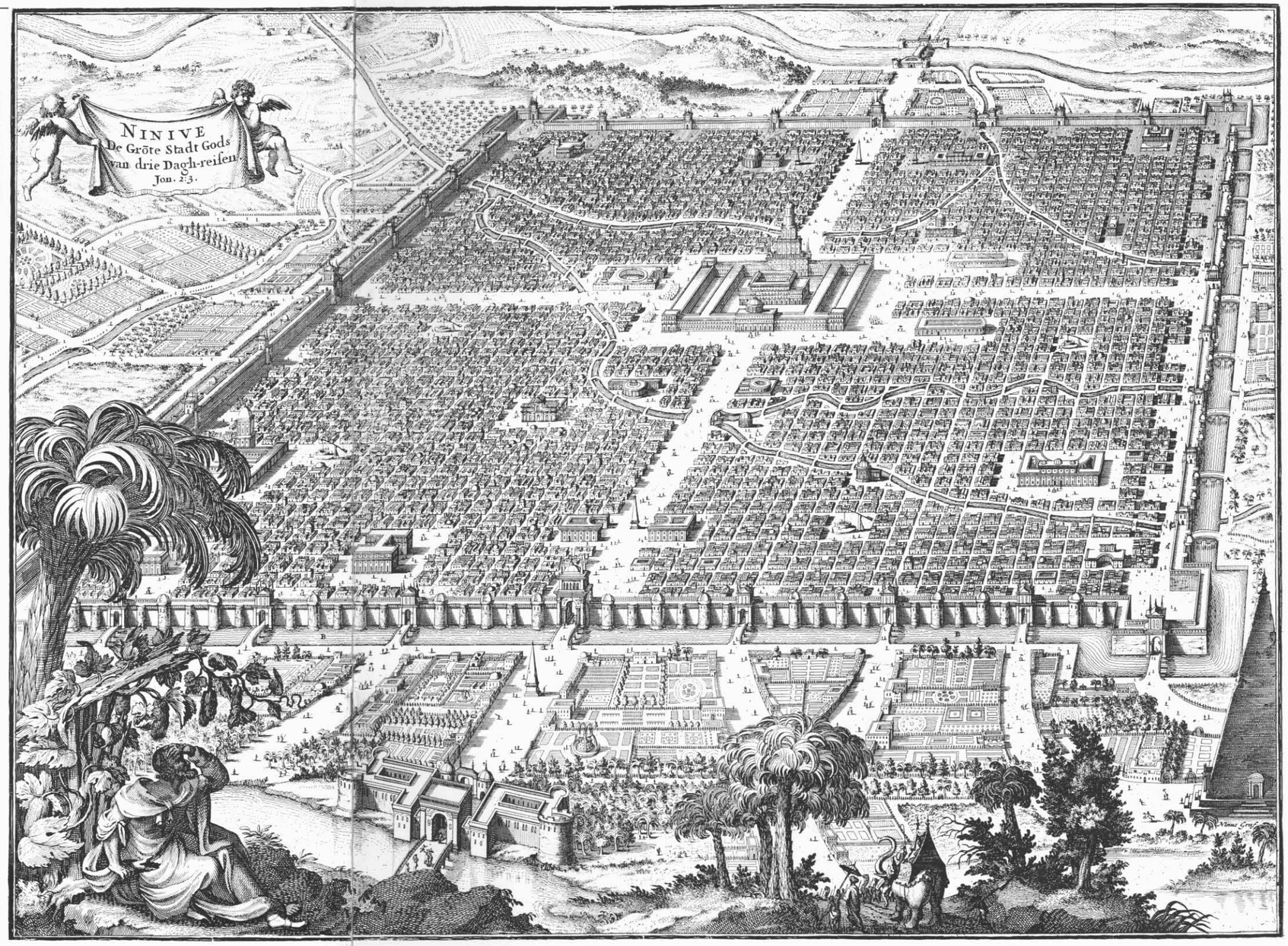
Layard's examination of the evidence revealed to him one basic motif of Assyrian art: the lion hunt. The motif seems to have fascinated Assyrian artists as much as the dangerous sport fascinated Assyrian kings, and the scene is portrayed over and over, with adept variations and developing technique, on the panels from Nineveh. Subsequent study has only reinforced Layard's conclusion that "the triumphs of the king over this formidable animal are deemed no less worthy of record than his victories over his enemies."

Layard fastened on the essential fact that the lion symbolized Assyria in its combination of courage, violence and sovereign disdain for any adversary that stood in its path. The lion roamed the hills and plains while lesser beasts fled before it. Just so did the Assyrians roam the Middle East, forcing capitulations from neighboring peoples.

But history played a sardonic trick on these masterful conquerors. They shook the ancient world; they created a terrifying reputation among the nations; then they simply disappeared. The very location of their capital city passed out of memory after the year 612 B.C. — after it was stormed by a coalition of enemies, sacked, burned and leveled to the ground.

So Nineveh lay, buried in rubble and time, ignored, forgotten, lost, until Henry Layard raised it from the dust. ■

Jonah was ordered by God to travel to Nineveh and preach repentance. Dutch caption, taken from Bible, describes Nineveh as a "great city of three days' journey."



Ancient Nineveh

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Odette earns her cap.

Nursing Comes Naturally

An Aramco scholarship is the key to a nursing career for eager young student, Odette Simaan

ODETTE SIMAAN is intelligent, attractive, ambitious and 19. The youngest of four daughters and a son born to Simaan Simaan in the olive grove district of Afideek El-Koura in the mountains of colorful north Lebanon, she personifies a new generation of Arabs eager for change and opportunity, eager for higher education, eager to serve.

Miss Simaan is one of five young Arab women selected

NURSING COMES NATURALLY

for Arabian American Oil Company scholarships by the American University of Beirut School of Nursing in Lebanon's capital city.

A striking brunette with finely formed features and sparkling dark eyes, Miss Simaan seemed destined for a nursing career since her childhood. "In our village in the mountains, father taught us first aid," she recalls. "I think he instilled in all of us a feeling of wanting to serve. A close friend of mine became a nurse. As I look back, I always wanted to be a nurse, too, and so I like my professional studies here in Beirut very much."

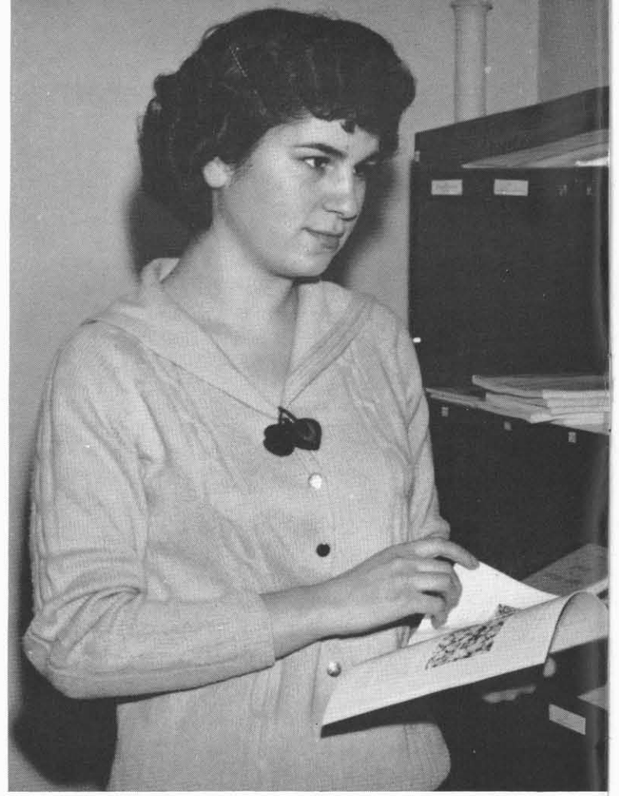
Miss Simaan, an above average student whose grades range from the 80's into the 90's, already looks well beyond her graduation from nursing school in 1963. Like her brother, Jabbour, 23, who received his bachelor of science degree in surgery this year from the College of Medical Evangelists in Loma Linda, California, she expects to undertake further studies in the United States. A bachelor's degree in nursing is her next goal. With increased experience and nursing knowledge, Miss Simaan hopes to be able to contribute to the betterment of patient care and health conditions in the Middle East. She hopes to be able to teach.

"I had my elementary school work at home in the village of Kaftoun from my sisters," Odette says, "but I graduated from Bishmezeen High School and then took courses at the Middle East College and Nader's College in north Lebanon. Then I taught secondary and elementary school – Arabic, general sciences, English and mathematics. I enjoy teaching."

Miss Simaan finds her student life at A.U.B. strenuous but exciting. She lives with some 60 fellow nursing students in Dale Home on the heavily shrubbed campus, overlooking the ever-changing spectrum of the blue Mediterranean. Her 8 A.M. to 5 P.M. class day, which alternates academic studies of biological and social sciences and nursing theory with patient care and study in the hospital wards, permits few leisure moments. But as a second-year student, she enjoys many privileges: her evenings are often free for music, books and occasional school parties. Born into a family of musicians, Odette plays the accordion as a hobby. "I like to play 'village' music and enjoy listening to Beethoven and Bach." On weekends she often visits her married sisters or her father.

Miss Simaan is typical, too, of hundreds of other Arabs now engaged in advanced study in the United States and the Middle East. The Aramco scholarship program, aimed principally at helping Saudi Arabia achieve new levels of education, has been greatly expanded. In addition to the five A.U.B. nursing scholarships awarded to Miss Simaan and the other Arab women, the Aramco program now includes 22 newly established scholarships. These study awards for Saudi Arab students are distributed among the following Middle Eastern institutions: American University at Cairo and Alexandria University in the United Arab Republic, the American University of Beirut and the Beirut College for Women in Lebanon. Principal areas of study are agriculture, business administration, engineering, medicine, science and teacher-training.

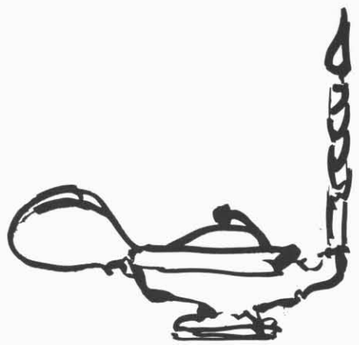
Also sponsored by the company is a one-year graduate



Odette's training is a blend of book and bedside experience.

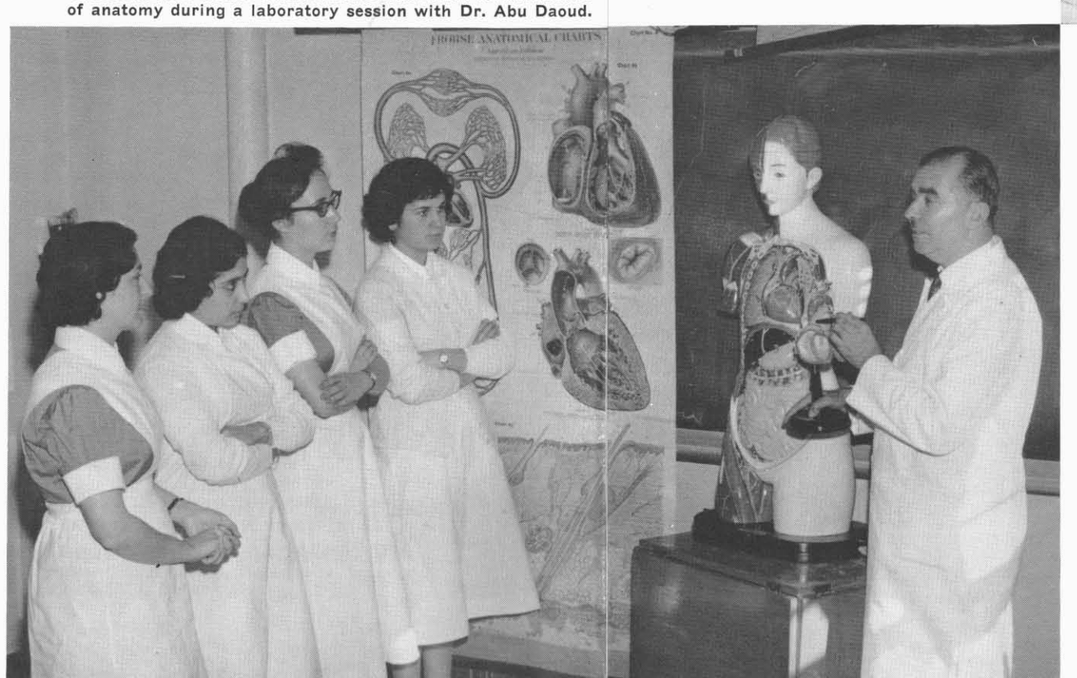
Photography by Khalil Abou El-Nasr

"As I look back, I always wanted to be a nurse."



Blood pressure reading is checked by instructor Suzette Fattal.

Odette and her fellow student nurses learn the fundamentals of anatomy during a laboratory session with Dr. Abu Daoud.



Mrs. Shafigeh Hereovababi, president of the Student Nurses' Association, lights Odette's candle during capping ceremony.

"I like to play 'village' music and enjoy listening to Beethoven and Bach."

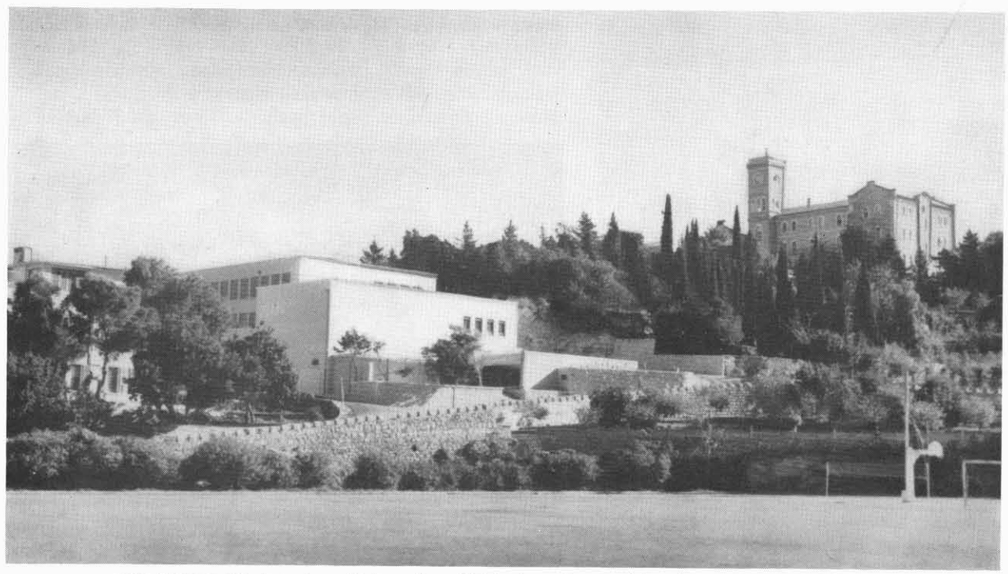
At Dale Home, Odette entertains with native tunes on the accordion or classical music on the phonograph.

NURSING COMES NATURALLY

fellowship at Harvard University School of Public Health and two graduate scholarships in Near Eastern Studies at the University of Michigan. In addition, Aramco supports an Arab Refugee Scholarship Program, administered by the United Nations Relief and Works Agency, under which 36 qualified refugee students are attending schools in the U.A.R., Jordan, Lebanon and Syria.

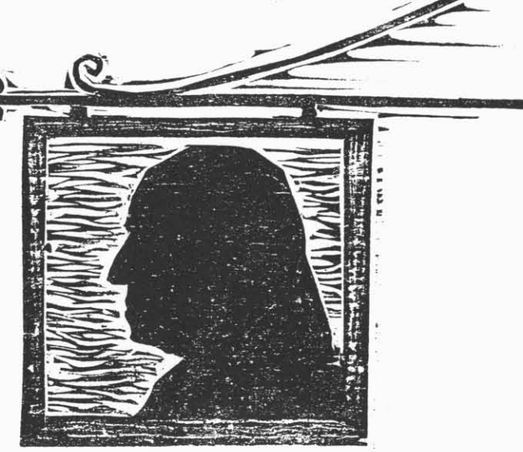
By the fall of 1963, the number of Aramco university-level scholarships open to Saudi Arabs will have increased to about 60 – the majority established in Middle Eastern institutions and some, in upper divisions or at graduate level, in the United States. All provide for tuition, living expenses, travel and incidental expenses.

All young people who win the awards, like Odette Simaan, will emerge better qualified to assist the Middle East to surpass even its glorious past. ■



The 96-year-old American University of Beirut contrasts old and new along the Mediterranean coast.

In The Name Of Washington



WHEN GEORGE WASHINGTON was a youth, his father planted seeds in a design that spelled the boy's name as they sprouted. Unbeknown to the father, this simple demonstration – contrived to convince his son of divine planning – presaged the future of the name "George Washington." In the generations immediately after Washington led the American colonies to victory in the Revolutionary War and became the first President of the United States, his name blossomed throughout the land.

Today a search for "Washingtons" across the map of America would turn up a state, 31 counties, more than 250 townships, at least 120 cities and towns (including those that use "Washington" in combination with such designations as borough, crossing, heights, ville), ten lakes, eight streams and seven mountains. It has been estimated that there are nearly 2,000 streets named for Washington, and no one can guess the number of schools, buildings, bridges, parks and other landmarks. But it is certain that no other man in history has had more namesakes than George Washington, the "Father of his Country."

The tendency to name things after George Washington began long before he became President. In the fall of 1776 General Charles Lee built fortifications on Manhattan Island and named them Fort Washington. Later that same year a town in North Carolina that had been organized in 1771 by a former colonel in Washington's troops changed its name from Forks of Tar River to Washington. Today a plaque in this coastal town calls it "the Original Washington." (Washington, Virginia also claims the distinction of being first. Although surveyed and plotted in 1749, it wasn't organized until 1796.)

As the General's fame grew, the use of his name multiplied. In 1777 the *Pennsylvania Journal* commented: "If there are spots in his character, they are like the spots in the sun, only discernible by the magnifying powers of a telescope. Had he lived in the days of idolatry, he had been worshipped as a god."

About the same time, John Adams told the Continental Congress that he felt Washington was being unnecessarily revered: "I have been distressed to see some members of this house disposed to idolize an image which their own hands have molten. I speak here of the superstitious veneration that is sometimes paid to General Washington."

Most of the towns named for the young nation's leading hero remained small. Only the capital grew large. For several years called Federal City, the capital became known as Washington in 1791 after its commissioners wrote to city planner Pierre L'Enfant: "We have agreed that the federal district shall be called 'The Territory of Columbia,' and the federal city, 'The City of Washington'." Although the commissioners had no authority to name the city, no one questioned their choice.

George Washington cherished the fact that his name was bestowed on the capital city, and he would have been equally pleased to know that one day there would be a Washington among the 50 states.

His name was first proposed for a state in 1817. A southern territory was about to join the Union, and some wanted to call it Washington. But arguments favoring the established territorial name–Mississippi–were slightly stronger; the latter won by six votes. Thirty years later "Washington" again was considered as a state name but lost to "Minnesota." Victory for those who wanted a state of Washington didn't come until 1889 – and not without a fight.

Oregon Territory's northern section was up for statehood, and its name – Columbia – was a popular one. The House of Representatives was about to pass "Columbia" without debate when a representative from Kentucky rose and said: "I desire to move to amend the bill by striking out the word 'Columbia' and inserting 'Washington' in lieu thereof. . . . This district is called Columbia; but we never have yet dignified a territory with the name of Washington." Another representative agreed, and soon a wave of veneration swept the House. The Kentuckian continued: "There has been but one Washington upon earth, and there is not likely to be another, and, as Providence has sent but one, for all time, let us have one State named after that one man."

A representative from Maryland disagreed. He urged the retention of Columbia. "We have perhaps one hundred counties and towns of the name of Washington," he argued. "I think it . . . proper to avoid the difficulties of geographical nomenclature. . . ." His remarks came too late.

In the Senate some tried to prevent the duplication, and one Congressman even proposed "Washingtonia." But enthusiasm for "Washington" was strong enough to withstand all objections. Perhaps those who wanted "Columbia" or "Washingtonia" foresaw that the term "District of Columbia" would lapse into comparative disuse and the duplications in "Washingtons" would force people to make endless and tiresome distinctions between "Washington State" and "Washington, D. C."

But when the Congressmen voted that day in 1889 to name a state after George Washington, they accorded him an honor never received by any other native American. ■

THE OTHER DISCOVERY

After years of shopping the world to supply its oil operations, Aramco is now passing on its purchasing experience to Saudi Arab businessmen and in a few years plans to buy 50 per cent of its supplies through local merchants

American oil men made two discoveries in eastern Saudi Arabia: oil and the human resources of Saudi intelligence, energy and initiative. Part One of this article (Aramco World, *January 1962) told the story of the dilemma of the Arabian American Oil Company in operating in a distant land. "We're oil men," was the company policy. But it had to become many things: grocer, road-builder, druggist, and so on. Part One also told the story of one solution to the dilemma: the growth of the Saudi Industrial Gas Company whose processing towers have become an area landmark. The increase of industry, importing and farming have proved an Aramco theory: modern business methods are the best foundation for a rational local economy. Today Aramco is well on its way out of its non-oil businesses. In a few years it will buy 50 per cent of its supplies through Saudi merchants. The story behind this achievement in "local purchasing" is told here in the second of two parts.*

ARAMCO FACES a curious set of related problems arising from its company policy to purchase as much as possible from Saudi merchants.

In the first place, the company must operate efficiently. This rules out unjustified premium prices in support of local merchants – they must compete with the going rates and practices in world markets.

First pipe purchased by Aramco from a Saudi Arab, 'Abd al-'Aziz al-Gosaibi (center), arrives under the watchful eye of Dammam Port Supervisor Ahmad Aziz (right) and Augusto Perdan, captain of the "Salina."

In the second place, Aramco spends huge sums on technology (the design, fabrication, shipping and installation of complicated machinery and processing units). Such purchases require a very high level of technical know-how. High cost rules out anything less than stringent inspection and supervision from drawing board to installation.

The purchase of technology on this scale presumes a technical sophistication that Saudi merchants have not yet acquired or brought under contract.

Aramco has had to build up a world-wide purchasing organization to be sure that required volumes of materials meeting precise specifications will be readily available for continuous operation of its many facilities.

After years of shopping the world the company is now passing on its experience to Saudi businessmen. It is this know-how, combined with his own experience, that will enable the Saudi importer to become self-sufficient and to be treated with fairness and respect abroad. Sometimes local merchants have not been given the benefit of price fluctuations in world commodity markets, and Aramco has had to step in and arrange fair adjustments.

All in all, the problems of the Saudi merchant under the Aramco competitive purchasing system have been formidable. Here are some of the functions he has had to, or will have to, master in his role as a supplier to Aramco:

Pricing, quoting, ordering in a foreign language or languages, inspecting, shipping, clearing, warehousing, delivering and financing.

Now, look at purchasing from the viewpoint of the company and you will get an additional perspective on the accomplishments of the Saudi merchants. The purchasing man has basic criteria: he wants to know the quality of the product, the reliability and integrity of the supplier, the price, the ability of the supplier to meet delivery dates and what services the supplier is capable of providing.

Sitting in the Local Purchasing office in Dhahran, he must also have available at his fingertips these facts about local merchants:

Suitability of facilities and organization to handle a specific contract, familiarity with and experience in the supply business, financial ability to conduct a business and assume risk, knowledge of markets and prime suppliers, adequacy of representation, ability to communicate and maintain proper liaison, and self-sufficiency.

Such are the practical hurdles.

And yet, this year the Arabian American Oil Company plans to spend about $12,000,000 with Saudi suppliers.

There have been three general phases in the evolution of a modern economy in eastern Saudi Arabia. In the first the Saudi was a company employee who received training in many skills and gained first-hand experience with modern business methods. In the second phase many Saudis left the company to go into business themselves and became contractors or merchant-suppliers to Aramco.

The present phase began with the capitalization of a domestic private industry and the switch by merchants from their early role as commission-agent-importers to their newer role as importers on their own account who began to sell to Aramco from their warehouse inventories. (Some of the capital came from Saudi businessmen in Riyadh, Jiddah and other Saudi Arabian business centers.)

Rows of warehouses at a Dammam railroad siding enable local merchants to supply Aramco's needs from stable inventories.

The evolution of local purchasing began in the second phase of Saudi economic development when local merchants first emerged. From the first days of local purchasing Aramco encouraged two main streams of progress: the development of local industry based upon indigenous or locally manufactured commodities, and the development of an import business based upon Saudi consumer needs, present or projected. The thousands of Saudi employees of Aramco provided a substantial new consumer base with an increasing potential.

This rational approach to economic development helped the Saudis put down firm roots in their natural business environment. There have been Aramco purchases such as line pipe for which the company is, of course, the sole consumer at present.

Paper products (bags, towels, tissues), concrete building blocks, fresh produce, soft drinks, industrial gas – these were some of the indigenous and locally manufactured products Aramco bought as its local purchasing program swung into high gear. At the same time, the import merchants with an eye on Saudi consumption began to supply a large part of Aramco's canned and packaged foods and commissary items (cosmetics, shaving materials, film, and so forth).

These latter items were subject to import duty for both Aramco and the merchants; thus the Saudis could compete on even terms with the company's own purchasing organization as far as duty costs went. However, there were and are many Aramco imports classified as duty-free under the Concession Agreement. These are materials and equipment the company uses directly in its oil operations. Saudi merchants are now close to the day when they will be able to import such items for Aramco's Concession use under a duty-free system. Some items are already handled on a duty-free basis through bonded warehouses.

The Saudi merchant must test every move he makes not only for present complexities but for future implications. He would be foolish to build a business exclusively based upon an Aramco contract. An unforeseen fluctuation in company supply requirements could leave him without a

business. In developing other markets for his products, the Saudi merchant needs a ready supply of business ingenuity.

Some Americans in Saudi Arabia remember an incident that well illustrates the ingenuity of local entrepreneurs. There was a standing contract for hauling silica sand at Ras Tanura where Aramco has its refinery. The contract was a dud in the eyes of the Saudis. Several had tried it and lost money. Then Yusuf Zuwawi of al-Khobar decided to try it. Zuwawi had gone to work for Aramco in 1938 when he was 14 and ten years later had begun his career as a contractor.

He bought some old Austin dump trucks with hard tires. The trucks were cheap and the hard tires cost one-fifth the price of sand tires. He then knocked both ends out of old oil drums, slit them down the side and flattened the metal. These sheets were cut in half lengthwise. He then laid the flat strips end to end and so created a two-track metal roadbed for the hard tires. The trucks thus got through the sandy stretches to the work roads.

Zuwawi made money and later built Aramco's first administration building.

But sometimes even ingenuity has its limits. A Saudi merchant cannot always deal on even terms with a prime supply source in a distant land using a different language. Then Aramco's world-wide purchasing experience, plus its persuasion as a tremendous buyer, goes into action.

For instance, a Dammam merchant contracted to supply coffee to the company. Near the end of the contract period world coffee prices dropped, but no adjustment was made by the Dammam supplier. And in his new bid he submitted the old price. The lower world market price had not been passed along to him. Aramco purchasing experts interceded. The prime supplier in Europe lowered the price to the Saudi merchant who was then able to submit a truly competitive bid.

Other instances could be cited. In the past Aramco has entered into freight rate negotiations to assure Saudi importers fair and proper transportation costs. And in a recent purchase of pipeline pipe through a local importer, Aramco became involved in the arrangements to the extent of paying the mill directly to save the Saudi merchant the added cost of interest charges. This particular purchase amounted to about $1,250,000. It illustrates the magnitude of some of the local purchases being made by the company today.

"If this assistance had not been rendered," an Aramco official remarked, "the local merchant would have been priced out of the market."

He then added an optimistic outlook: "But, in the future the company expects that less and less of this type of assistance will be necessary."

As the Saudi merchants gain more experience in the complex supply business, local purchasing is bound to increase.

By 1954 such purchases first passed the half-million dollar mark. That was the milestone year from which local purchasing took its present momentum. In 1955 the company placed over two million dollars in purchase orders with local merchants. Then in 1958 another big jump came when company payments to local suppliers advanced to $5,588,000 – a figure that is some two-and-a-half times the 1957 payments.

The biggest year to date was 1959 when total payments made through the company's Local Purchasing office reached $6,263,000. The following year Aramco's total purchasing dropped, and the drop was reflected in the dollar value of local purchases. However, local purchasing held to its basic gains: the per cent of local purchases in relation to total Aramco purchases remained the same.

At the time this article was written only unofficial estimates were available for 1961. However, it appeared late in the year that the total of local purchases was headed for a new record – possibly as much as $10,000,000.

There are many good businessmen among the Saudi merchants. Their cumulative experience is built into the momentum behind the upward sweep of Aramco's many local purchases.

How far can their ever-increasing business know-how take them?

Robert S. Hatch, the vice president who has the responsibility for Aramco's over-all purchasing, has a blunt answer in terms of the foreseeable future: "Within five years the company expects to spend 50 per cent of its purchasing bill with Saudi merchants."

Aramco applies its own pressure to speed up the growth, and speed is in the air these days in the Local Purchasing offices in Dhahran.

"We aimed to introduce sound business practices in encouraging local merchants," Hatch says. "Our idea was to help them develop good business organizations. And they had what it took.

"They have had difficulties. For example, we decided that we would help to get manufacturers' representatives to come to Saudi Arabia to call on the merchants here. We set certain limits though. We would facilitate contacts, but we would *not* participate in their negotiations. Also, we expected the representatives to handle their own visa matters after the first visit.

"There were very limited hotel accommodations in the area, so some of the merchants installed living quarters in their business premises just for the convenience of their business visitors.

"The modern wholesale system was first introduced in supplying Aramco when Yousuf Mahmood Hussain of al-Khobar became a Colgate wholesaler and began to supply Aramco from his warehouse inventory," Hatch continues.

"It was this sort of development that led us to clear out about one-half the items we bought, imported, stored and sold through the Aramco canteen. In the 1955-1956 period the employees started buying such items from the Saudi stores in al-Khobar. We got out of that business as far as we could. Today, 54 per cent of what we still carry in company commissaries is purchased through local suppliers.

"We wanted to get out of the produce business, and Dr. Grover Brown's agricultural assistance program—a company project – has been a big help in that direction. Better Saudi farming methods have led to more local produce and a wider variety of crops. Now there is a Vendors' Market in Dhahran where Saudi farmers sell their produce directly to Aramco employees.

"We estimate that for 1961 it took about 1,250,000 pounds of produce to supply Aramco employees. The company imported directly 300,000 pounds and bought 500,000 pounds from Saudi merchants. Half of this latter amount was grown here. The remaining 450,000 pounds of produce that Aramco employees consumed was sold to them through the Vendors' Market – and about half of that amount was from local farms.

"We believe that these developments illustrate progress on a broad base that provides a firm underpinning for Saudi economy. And they have been very helpful to us in getting out of non-oil business and services," Hatch says.

What about the progress curve in local purchasing?

"We are currently making about 20 per cent of our purchases through our Local Purchasing Department. But it isn't enough," he continues.

"By 1963 we should be buying about 33 per cent through Saudi merchants. And as I said, we should reach 50 per cent in five years."

But there are qualifications.

"We still have to assume the responsibility for costly purchases that are highly technical in nature. For example, we had to purchase specially designed compressors manufactured under license in Italy for a gas injection facility. And only recently we purchased a refrigeration plant for liquefied petroleum gas. This highly specialized equipment demands on-the-spot inspection and step-by-step supervision. As I say, we cannot shift this responsibility.

"In any forecast," Hatch concluded, "you must take into consideration the fact that the real future of our local purchasing will rest largely upon the broad expansion of local industry. This will in turn depend upon diversification and growth in Saudi consumer demand.

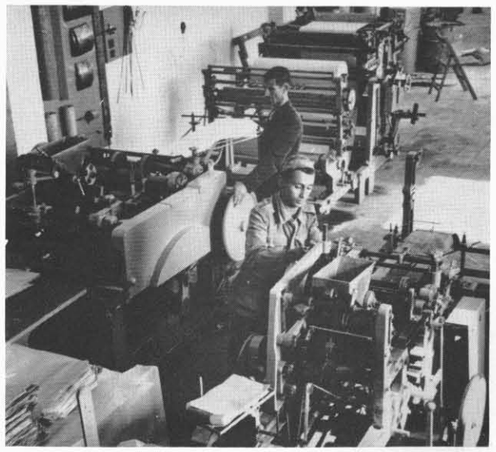
"But you must keep in mind that the Saudi businessman has accomplished a great deal in a short time."

After he had studied Aramco's Arab Industrial Development program in action, Carleton S. Coon, a world-famous authority on Middle Eastern life, wrote: "It may go on record as one of the outstanding jobs of social engineering in this phase of the history of the world. . . ."

"Of course," he continued, "the Saudi Arabs deserve equal credit for their intelligence, energy, capacity for hard work under adversity, and for their honesty, fair-mindedness, and generosity."

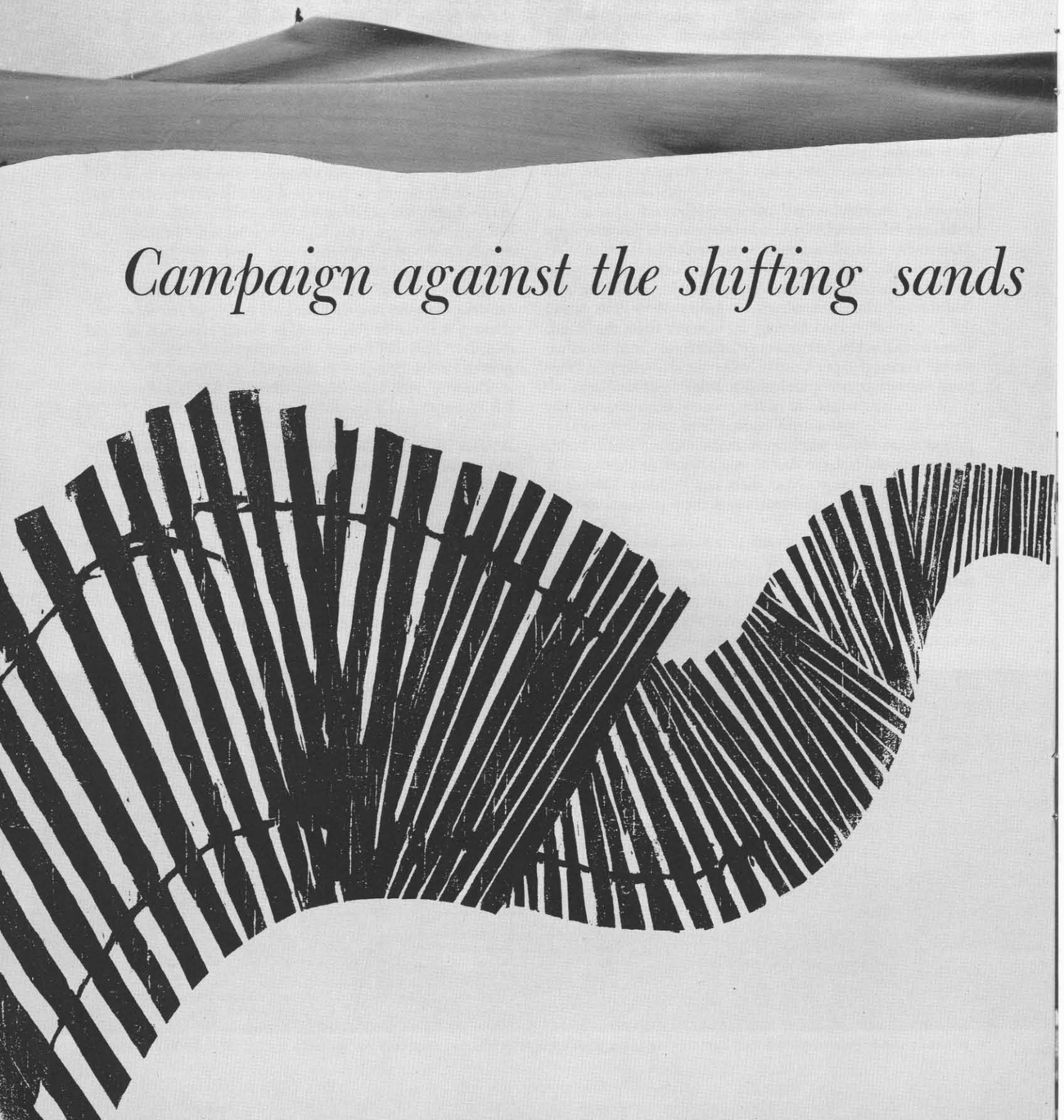
Such was the other discovery Aramco's oil men made in Saudi Arabia. ■

Dhahran Vendors' Market sells home-grown produce.



Paper products for Aramco are made by Dammam firm.

A street in the Persian Gulf port of Dammam is lined with Chevrolet trucks, imported for Aramco by Saudi Arab businessmen.



Campaign against the shifting sands

Taken by the grain, sand is harmless enough, but shaped by the wind into towering dunes, it becomes a relentless invader that must be stopped

THE SAUDI ARABS regard the everlasting sands of their homeland in the same way that the Dutch look upon the sea or the Swiss upon the snow. Taken by the grain, the drop or the flake, these substances are harmless enough. But heap them up into massive bodies and they generate a formidable power that awes those who know them.

Sand dunes are a problem over much of the Arabian Peninsula, just as the angry waters behind the dikes menace the maritime Netherlands and just as avalanches hang ponderously over the heads of the upland Swiss. Rampaging waters and plummeting snowslides, electrically quick in their violence, are no more destructive than the banks of Arabian sand that move almost imperceptibly, choking whatever lies in their path. While no able-bodied townsman or Bedouin has ever been swallowed up by encroaching sand, the damage to their property and means of livelihood has been as enormous as that of flooded farmlands in the Low Countries or snow-drowned villages in the Alps. But today there is hope in the hearts of the Saudi Arabs: the Government has marshaled its finest forces to wage the life-and-death struggle.

How does one of these heavy-handed destroyers come into being? The genesis of a dune is still a matter of speculation, but geologists believe they originate when wind blows sand against an obstacle like desert brush. This insignificant hurdle often constitutes the tiny core of what may become a mammoth hill of sand anywhere from six to 700 feet in height.

The velocity and duration of the wind are chiefly responsible for the rate of sand accumulation and also account for the shape of a dune. Dunes are of two types — the stationary mountains or the migratory masses. And it is the wind which fashions their form as it relentlessly nudges the dunes across the wastelands of eastern Saudi Arabia.

Seen from above, a migratory dune usually assumes the shape of a crescent. The back stands against the wind; the front faces away from the wind's course. A crest running across the top from horn to horn separates back from front.

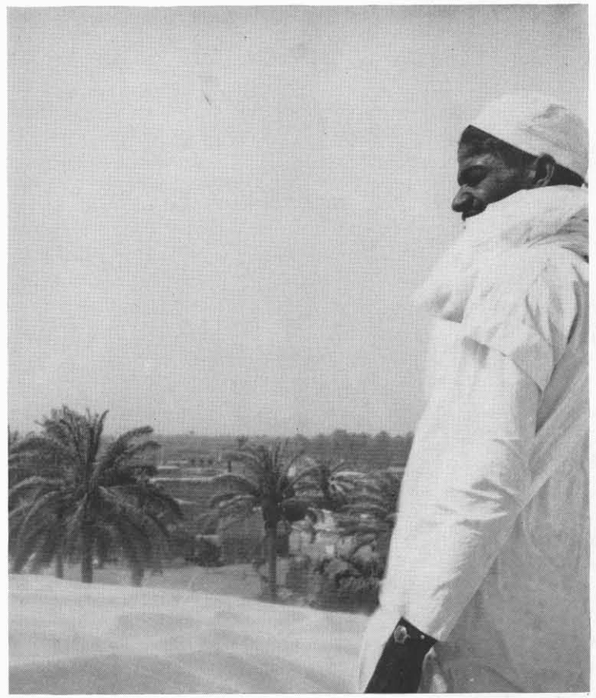
For the sand dunes to become mobile, the wind must be a prevailing one. If it shifts erratically, the pile of sand deposited by one breeze will be whipped off course by an opposing current. Variable winds weave irregular patterns into the sand mounds, often stretching them out into elongated ridges or heaping them into pyramids.

Eastern Saudi Arabia offers ideal conditions for the formation of migratory dunes — a superabundance of sand and a year-round prevailing wind.

This otherwise gloomy outlook is brightened by one ray of optimism, however. The movement of the sand is relatively predictable. Winds blow across the Peninsula in a predominantly southeasterly direction. The *shamals* (sandstorms) that whine for days on end are the breath of life for the dunes. They push the grains of sand together, coaxing them into mounds, then into hills and finally into mountains. They guide them to the Rub' al-Khali, that desert of deserts in the southeastern quadrant of Saudi Arabia. Here the wind becomes variable and breaks up the creeping crescents, rearranging them in jagged prominences haphazardly heaped around the vast wasteland that is the Empty Quarter.

A sand dune on the move goes through a tumbling process similar to the action of a modern washing machine. First a wind lifts grains of sand and they begin to gather around an obstruction. As the wind rises, the sand whirls faster and faster. The frenzied grains, escaping the wind's battery, trickle down the facade of the dune. Reaching the bottom, they are buried by other granules, each falling a fraction of an inch farther forward than its predecessor. Eventually the original grains are freed and pushed up to the top of the dune, only to slide down its face once again.

Sand dunes migrate at a speed practically microscopic to



Poised at the doorway of the village of al-'Umram on the eastern outskirts of the al-Hasa Oasis, a 16-mile-long, 4-mile-wide dune threatens to swallow up valuable farm land and then, unless it is stopped, will move on to the town itself.

SHIFTING SANDS

the casual observer. But the smaller the dune the faster its destructive progress. A crescent measuring 500 yards from horn to horn moves approximately 15 feet a year. Smaller dunes often race a distance of 60 feet in the same time.

The supply of sand never runs out. While the wind buffets the sand southward, new grains are being created through the erosion of rocks far to the north.

Sand is a crop strangler. Near al-Khobar on Persian Gulf, sand engulfs palm trees that once grew from level ground.

An airplane flight over the rim of the oil-producing region of eastern Saudi Arabia will bring home with tremendous impact the magnitude of the sand migration problem. From the cabin window a passenger can view one sprawling dune, sixteen miles long and four miles wide, looming like a frozen tidal wave. It stands poised at the doorways of a dozen villages. It has already spilled into irrigation ditches, cutting off drainage, clogging artesian wells and strangling crops. It has shouldered its bulk against the threshold of one of the Kingdom's most precious assets – an oasis. Creeping at a silent but nonetheless merciless pace, the tons of sand promise to engulf the al-Hasa Oasis unless the onward drive can be checked.

The Saudi Arab Government's Ministry of Agriculture has launched a five-year dune stabilization campaign to save the storied oasis from annihilation. A number of specialists from the Arabian American Oil Company are participating. Having waged a continuous fight against the sand forays around the oil installations to the north, the Aramco investigators have a good knowledge of the ancient, ever-present threat that faces them.

The experts envisage combating the invasion in four different ways:

One weapon is a by-product of the same substance that Saudi Arabia produces in tremendous quantities–oil. Spraying asphalt–a petroleum derivative–on the exposed surfaces of dunes slows them in their tracks. This method has been employed from time to time along the highways where trespassing sand threatens to obliterate the right-of-way.

Building sand fences, which break up the dunes' contours and thus reduce their accumulating mass, has proved quite successful in the past. The barriers resemble the ones set up in northern countries to hold back crushing snow drifts. But sand is even more crushing: it weighs up to ten times as much as snow and is difficult and costly to remove.

Earth-moving machinery will also be mustered into the conflict. This equipment will be called upon to flatten the dunes as much as possible and will dig deep trenches in front of the dunes to catch them in traps.

Another anti-sand device involves the planting of trees and shrubs ahead of the dunes' line of march, much as farmers in many parts of the world plant trees and hedge rows to protect fields from wind and snow. These obstacles help to spread the dunes asunder as they pass by.

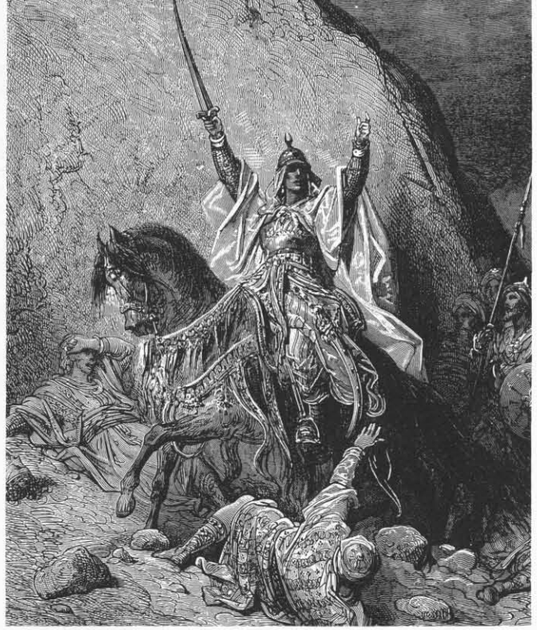
The sand specter comes as no stranger to the Eastern Province. But now there is a possible means of solving it. This is an age-old enemy that lives on as the wind piles up new sand dunes and shoves them inch by inch toward that graveyard of the desert itself–the Empty Quarter. Who knows what fabled cities and temples these vagrant grains have buried, or what ancient tombs they have reburied? Perhaps the dunes have done their last mischief now that weapons against them are at hand. Everyone in the Eastern Province will be watching which way the tide will turn in the "battle of the dunes." ■

Champion of The Faithful

Even so worthy a warrior as Richard the Lion-Hearted paid homage to the Islamic leader, Saladin, who was more than a match for the Crusaders

THE RASP OF steel against stone whispered through the night air as soldiers sharpened their swords for battle. By the waning flicker of a banked fire a Crusader polished his armor to a high sheen. Elsewhere a huddle of knights whirled and thrust in a frieze of cavalry charges. A calm breeze ruffled the beards of a nearby group of warriors, laughing softly in the stillness.

The Crusaders besieging the Palestinian city of Acre



Master strategist Saladin successfully opposed the Crusaders by rallying the combined strength of the Islamic countries.

CHAMPION OF THE FAITHFUL

in 1191 were supremely confident of victory, even though they knew that a Muslim army had come up behind them. They were heartened by the pennons of France and England flying above the two royal tents that dominated their camp on the Plain of Acre. Moreover, an army of Germans had marched in to join them. There were now 20,000 Crusaders eagerly awaiting the command to attack either the city or the enemy.

The charge was delayed long enough for one of the most fascinating dramas of history to be played out. It began with a party of European knights passing through the Muslim field fortifications under a flag of truce. They were shown to the summit of a hill on which stood the tent of the revered Islamic leader—a sumptuous pavilion gaily ornamented in Arabic style and bedecked with the Banner of the Crescent. They walked between files of silent, curious courtiers until they stood in the presence of the man they had come to see.

Saladin was both a poetic myth and a stern reality to the Crusaders. The one Islamic leader at whose hands they had suffered decisive defeats, he was also the chivalrous hero around whom they had spun countless legends, anecdotes and songs. They knew him as a foeman worthy of their steel—and their stories.

The envoys from the Crusader camp were, therefore, much beguiled by the figure before them. Saladin's appearance seemed at first almost anticlimactic. He was a slim, dark man of 53, far below average height by European standards. His pointed black beard was cut in the style preferred by the nobles of Islam. Dressed in the spare field uniform of a Muslim general, he fingered the jeweled hilt of a gleaming scimitar at his belt.

But the strong level gaze of his brown eyes, the authoritative tone that underlay his words however courteous, revealed that here was one accustomed to command. Bidding his visitors welcome, he came directly to the point.

"I am informed," said Saladin, "that you come from King Richard of England, he who is called by you the Lion-Hearted. Well, what has Richard the Lion-Hearted to say to me?"

"Sire," replied the Crusader spokesman, "King Richard would parley with the Lord of Islam."

"Does the Lion-Hearted tremble so at our power that he would surrender before the battle?"

"Not so, my liege. King Richard bids me say that he fears no one, not even the valiant Saladin. He is willing to confer with you on equal terms. If you refuse, he will cross swords with you; and the terms will not be equal, for he will beat you back to the gates of Jerusalem."

Saladin smiled. With a significant gesture he pulled his scimitar halfway out of its scabbard, then thrust it back with a sharp click.

"There is nothing more to say," he responded. "Return to Richard the Lion-Hearted and tell him that I will not consent to meet him unless one of us be brought captive before the other."

Such was the answer that the envoys carried back to the Crusader camp. Richard was disappointed, for he longed to take the measure of his illustrious opponent at a personal meeting. Historians ever since have been as chagrined as he, deprived as they were of the chance to portray a spectacular summit conference at Acre in the heroic days of the Third Crusade.

Historical novelists, enjoying wider latitude, have refused to be bound by unimaginative fact. Repeatedly they have shown Richard and Saladin confronting one another. The classical text is Sir Walter Scott's *The Talisman,* and a favorite scene of this novel is that in which Saladin, unable to resist the temptation to view his flamboyant rival in the flesh, visits the Crusader camp disguised as an Arabic physician come to treat Richard for the fever.

Just who was this man of Islam that he should prove so irresistibly attractive to the European imagination through the centuries?

Saladin was not born to greatness. He achieved it. Descended from a family of Kurdistan and a native of Damascus, he entered the service of the Caliph as a soldier in Egypt. There he quickly grasped the basic problem of the time: the Latin Kingdom of Jerusalem, founded a century earlier by the European knights of the First Crusade, could not be opposed successfully except by a strong centralized Islamic power. The extraordinary energy of the invaders had to be matched by their adversaries—the energy that sent thousands of soldiers marching thousands of miles from Europe, down through the Balkans to Constantinople, across the Bosphorus into Asia Minor, on to Palestine and victory over the native powers of the Middle East.

Jerusalem was the object of the Crusades, and by Saladin's time the Crusaders had performed the remarkable feat of holding the Holy City for a hundred years as the capital of their Latin Kingdom. They would have held it longer except for Saladin. His appearance changed the whole character of this titanic 200-year struggle.

His first task was to bring order into the Islamic world. From his base in Egypt he launched a drive into Syria.

Ruins of Crusader castles, like these in Sidon, Lebanon, are stern reminders of the 200-year strife led by resolute men such as Richard the Lion-Hearted.

Putting down local factions and petty potentates, he extended his rule over the entire area outside the Crusader domain. The Fatimid Caliphate of Cairo was showing signs of weakness. Only one man could replace it—the statesman and conqueror who had already demonstrated his capacity for leadership. In 1175 Saladin became Sultan of Egypt and Syria. Soon he would be ranked in Arabic lore with Omar the Great and Harun al-Rashid.

Saladin's personality has come down to us in the testimony of both Arabs and Crusaders. He was a ruler who allowed himself to be sued by his subjects. Vast wealth could have been his for the taking, yet he left a single gold piece as his legacy when he died. His piety caused him to endanger his health by fasting. So proverbial was his honesty that a popular ballad of medieval France puts this line into the mouth of a Crusader: "We trust Saladin because he never lies."

The secretary who traveled with him recorded numerous instances of his kindness. Once the secretary was abashed and wanted to fall behind when his mule splashed the Sultan with mud, but Saladin laughed and told him to stay where he was. The leader of the Islamic armies was compassionate to a degree rare for his time: he would not tolerate cruelty among those at his court, and, among other things, put an end to the beating of servants.

It is easy to see how the legend of Saladin grew among the Crusaders with whom he exchanged blows on the battlefield. If he was chivalrous, he was at the same time nearly invincible.

Having solidified his own power, he turned it effectively against the Latin Kingdom of the European invaders. During his *annus mirabilis* of 1187 he defeated the Crusaders at Tiberias, maneuvered them into the disaster of Hattin, occupied Acre, and entered Jerusalem as a magnanimous conqueror who declared that the rights of all religions would be respected.

Hattin was Saladin's military masterpiece. When the King of Jerusalem, Guy of Lusignan, dared to attempt a foolhardy march across the desert at the head of 15,000 Crusaders, Saladin astutely let him go unopposed. It was July. The hot sun stifled the knights in their heavy armor and slowed their ponderous war horses to a walk. They ran out of water, and men and animals staggered along tormented by thirst.

The Muslims, 18,000 strong, shadowed them until they camped at Hattin. There Saladin ordered the scrub vegetation around the camp to be set afire. Waiting for the critical moment, he launched his troops against foes who were not only weary and parched but choking with smoke. The Muslim cavalry broke through the ranks of the weakened knights, rolled up their line and overwhelmed them.

The Crusaders never recovered from this defeat. Saladin's master strategy at Hattin brought about a turning point in the Crusades.

Still, coastal strongpoints like Antioch and Tripoli remained, and from them an urgent appeal went back to Europe. The result was the Third Crusade. On June 8, 1191, the Crusaders besieging Acre were overjoyed to see 25 galleys sailing into the harbor, bringing with them several thousand reinforcements—and Richard the Lion-Hearted.

Richard was the perfect foil for Saladin. A blond, blue-eyed giant who could split a block of oak with one blow of his sword, his chief joy was galloping into battle. Less than two months after his arrival he stormed Acre, which had held out for two years. He pressed on into the southern desert, bearded Saladin in his den, and fought forward doggedly day by day, always at the head of his men. He defeated Saladin in the big battle of Arsuf. He took Jaffa. He vowed to take Jerusalem.

But the harsh terrain and the marshaled host of Islam with its greater numbers foiled him. Jerusalem still lay beyond his grasp when he abandoned crusading, called home to England by the machinations of his younger brother (who subsequently inherited the throne as notorious King John).

During his brief stay in the Middle East, however, Richard the Lion-Hearted engraved his name as indelibly into Arabic folklore as did Saladin into that of the West. The King of England also gave the Crusades a reprieve. Acre became the new capital of the Crusader Kingdom. Strongly entrenched on a rugged headland jutting out into the Mediterranean, protected by the sea on the west and south and by massive fortifications on the east and north, manned by knights who could easily be supplied by ships from Venice and Genoa, Acre stood impregnable for another century.

Nevertheless, the fate of the Crusades had been sealed by Saladin, who, dying in 1193, bequeathed to his successors the unified stabilized political power that ultimately prevailed. Almost precisely a century after he liquidated the Latin Kingdom of Jerusalem, the Crusader Kingdom of Acre fell (1291). Later crusading efforts achieved little. The titanic struggle was over.

Its great themes echo still, including the theme of what might have been had the two superb leaders kept the appointment that the one craved and the other denied him. The most dramatic meeting of historical personalities that never took place was that which would have brought face-to-face, amid the glitter and the glory of the Third Crusade, Richard the Lion-Hearted and Saladin. ■

Dauntless conquerors themselves,

Assyrian rulers

chose

the "king of beasts"

as the symbol

to adorn the walls

of their proudest city

NINEVEH

THE JEWEL OF the Assyrian Empire was the capital city of Nineveh. Halfway between the Mediterranean and Caspian Seas, astride the northern arc of the Fertile Crescent, the mighty fortress city was the center of a feared military state. From her position on the upper reaches of the Tigris River, Nineveh extracted tribute from other famous cities to the south – Sippar, Babylon, Kish, Nippur, Lagash and Ur. By 700 B.C. Assyrian kings, rich from East and West trade and ambitious from far-flung conquests, sat in state in Nineveh, city of 71 palace halls. Around them they built massive stone walls manned by armed soldiery.

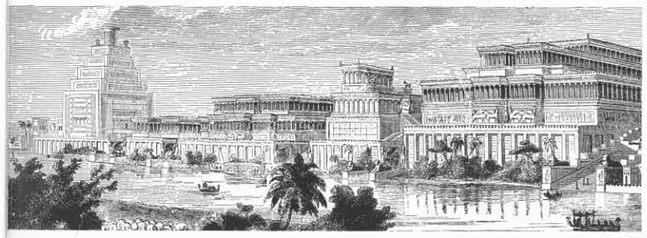
Sculptors carving panels for the Palace of Sennacherib or the Temple of Ishtar might pause to watch the most disciplined troops in the world as they marched out through the gates of Nineveh onto the imperial highways leading toward the subjugated territories of Babylon, Syria and Egypt. Civilians, too, traveled the Assyrian roads – provincial governors, diplomats, envoys from client states, traders. Mailmen, bearing tablets of dried brick with impressed cuneiform characters, conveyed messages to and from the farthest limits of the empire.

Looking inward from the top of the ramparts, the sentries had a marvelous panorama spread before them. The city lay along an axis paralleling the Tigris, while a tributary stream, the Khoser, bisected it laterally. Near the western wall rose the heights of Nineveh, a rocky plateau 90 feet above the plain and a mile long, the summit of which gave a commanding view to the walls and beyond on every side.

The heights belonged to the kings and gods of Assyria. At the northern end stood the Palace of Ashurbanipal, at the southern end the Palace of Sennacherib, and between, the Temple of Ishtar and other public buildings. Here the king of Assyria took his ease, ruled his realm, and performed his religious duties to the tutelary deities of the nation.

The area below the Khoser was for the most part given over to the rude dwellings of the common people, the warren of humanity to be found in any metropolis, ancient or modern. A feature of lower Nineveh was the reputed Tomb of Jonah, who preached repentance to its inhabitants after his adventure with the whale.

Thousands of people thronged the streets of Nineveh. Nobles in brilliantly dyed gowns of linen and cotton contrasted with the roughly clad lower classes. Hard-bitten veterans of sanguinary battles swaggered along swinging their swords, fingering their daggers, jostling past meditative priests of the Ishtar cult. Merchants called out their wares from the stalls, most of them Arameans, the masters of finance who controlled the trade of the Fertile Crescent. Suddenly a buzz of excitement would begin. The crowds would separate on either side of the main thoroughfare, and



Stately palace of Sennacherib towered above walled Nineveh.

the king would ride through surrounded by his flashing retinue of officials, secretaries and guards. He was on his way to war or hunt, to palace or temple.

The Assyrians were able to build solidly because, unlike the Babylonians who had no material better than the clay of the low-lying Plain of Shinar, they quarried stone in the foothills of their mountains. They put sturdy foundations underneath their main buildings, although they still tended to use brick for the superstructures. Like the Egyptians they had no labor problem because their victorious armies kept them supplied with forced laborers.

The majestic Palace of Sennacherib, rising several stories on the heights above the Khoser, had hundreds of rooms – from the imperial living quarters to the mint where bars of silver from Cilicia were coined into *shekels*. The arsenal of the palace was filled with weapons of iron, the metal that turned the tide toward the Assyrians in so many conflicts with foes who had not yet emerged from the Bronze Age. The Assyrian military used iron not only for daggers, spears and arrow tips, but also for the devastating war chariots that created havoc on the battlefield and for the towering siege engines that battered down fortifications in places as far apart as Babylon and Egypt.

Assyria was more than the Sparta of the Middle East. Even King Sennacherib, who carried fire and sword to the very hearths of his enemies, enslaved multitudes, turned the waters of the Euphrates across the ruin he had made of Babylon, and left his name as a byword for inordinate cruelty – even this stern monarch furthered the development of a high culture. The oldest surviving aqueduct is the one Sennacherib ordered constructed to bring fresh water from the mountains into Nineveh.

His grandson, King Ashurbanipal, became one of the memorable patrons of all time, a Louis XIV of antiquity who bestowed pensions on writers, artists and scholars. This monarch gathered a splendid library of 40,000 clay tablets and employed an academy of scribes to edit them and to record for posterity everything from primeval legends to medical prescriptions. Ashurbanipal's editors, among their other gifts to humanity, produced the definitive text of the Babylonian Epic of Gilgamesh, doing for the earliest of all heroic poems what the classical Greeks were to do for Homer.

The most magnificent achievement of Assyrian culture was in the field of art – the carved figures with which sculptors decorated temples and palaces. By filling open spaces with scenes of battlefield and hunting ground, the Assyrians bequeathed a rich legacy to archaeologists.

The sport of kings in ancient Assyria was not horse racing. It was the lion hunt. The rulers of Nineveh furiously pursued the big cats through the hills above the Tigris River, finding a unique thrill in the dangers of the chase. It is still possible to feel that thrill, across the chasm of time, by following a royal excursion into Assyria's lion country. The shouts of the beaters echo from the thickets where they are flushing the lordly quarry. The hunters surge forward tense with expectancy and raise an excited shout at the sight of a tawny coat.

The place of honor belongs to the king, who meets the charge of the lion head-on with his lance or fires arrows from his chariot while his charioteer guides a triad of foaming horses across the plain.

This picture of the Assyrian lion hunt is still fresh and clear because it still exists – in stone. Assyrian sculptors portrayed the royal huntsman at every moment of the action, beginning with the pursuit and ending with the kill.

Sometimes the hunt is depicted from the side of the hunted, for the Assyrians regarded the lion as a gallant foe worthy of a monarch's lance. There is empathy, almost sympathy, in the way the artist's chisel captures for all time a split second of violent action – the snarling lion at bay, the wounded lion turning savagely on its pursuers, the dying lion making one last convulsive swipe with its massive paw.

The masterpiece of the genre, and one of the finest