"We beseech God to give us the strength to accomplish what is good for our realm and our faith, giving comfort to our people and raising their standard so that they may attain a fitting place among progressive nations."

ARAMCO WORLD
505 PARK AVENUE
NEW YORK, N.Y. 10022
RETURN REQUESTED

Mr. & Mrs. Paul J. Swartz
1612 South Bend Ave.
South Bend 17, Ind.

CSF

BULK RATE
U. S. POSTAGE
PAID
New York, N. Y.
Permit No. 10

ARAMCO WORLD

January—February 1965

To Light a Flame

ARAMCO WORLD

VOL.16 No.1 PUBLISHED BI-MONTHLY JANUARY-FEBRUARY 1965

TO LIGHT A FLAME

Out of the night came the prince and his raiders ... to seize a city and rally the desert to his cause ... — 1

By David Howarth

MONUMENTS OF THE NILE

In every corner of the ancient valley they stand ... the gigantic creations of Egypt's master builders — 9

By Tor Eigeland

A PATH TO PROGRESS

To outsiders 'ITC' means Industrial Training Center ... to Aramco it means better jobs and better men — 19

By William Tracy

INSIDE ARABIA FELIX

Here, in mystery, lived the Shebans and their queen ... in what the Romans said was splendor beyond belief — 24

By G. Lankester Harding

UNDER THE MOUNTAINS

By touch and by torch they pick their way forward ... men and women exploring the depths of inner space — 29

By Jan van Os

Illustrations: To Light a Flame — drawings by Sydney King. Monuments of the Nile — photographs by Tor Eigeland. A Path to Progress — photographs by V. K. Antony and Abdul Latif Yusif. Inside Arabia Felix — photographs by G. Lankester Harding. Under the Mountains — photographs by Larry Sherman and William Tracy.

Published by the Arabian American Oil Company, a Corporation, 505 Park Avenue, New York, New York 10022, T. C. Barger, President; J.J. Johnston, Secretary; E. G. Voss, Treasurer, Paul F. Hoye, Editor. Printed in Beirut, Lebanon, by Middle East Export Press, Inc.

Cover: Few men in history so stamped their personal imprint upon a nation as did the late King 'Abd al-'Aziz upon Saudi Arabia. And few men of the Middle East were ever as familiar to the western world as this towering ruler in the regal Arab headdress whose curiously enigmatic smile flashed out from front pages around the world beside such men as Franklin D. Roosevelt and Winston Churchill. But all that came later. In the beginning he still had to light a flame in the desert.

BY DAVID HOWARTH

TO LIGHT A FLAME

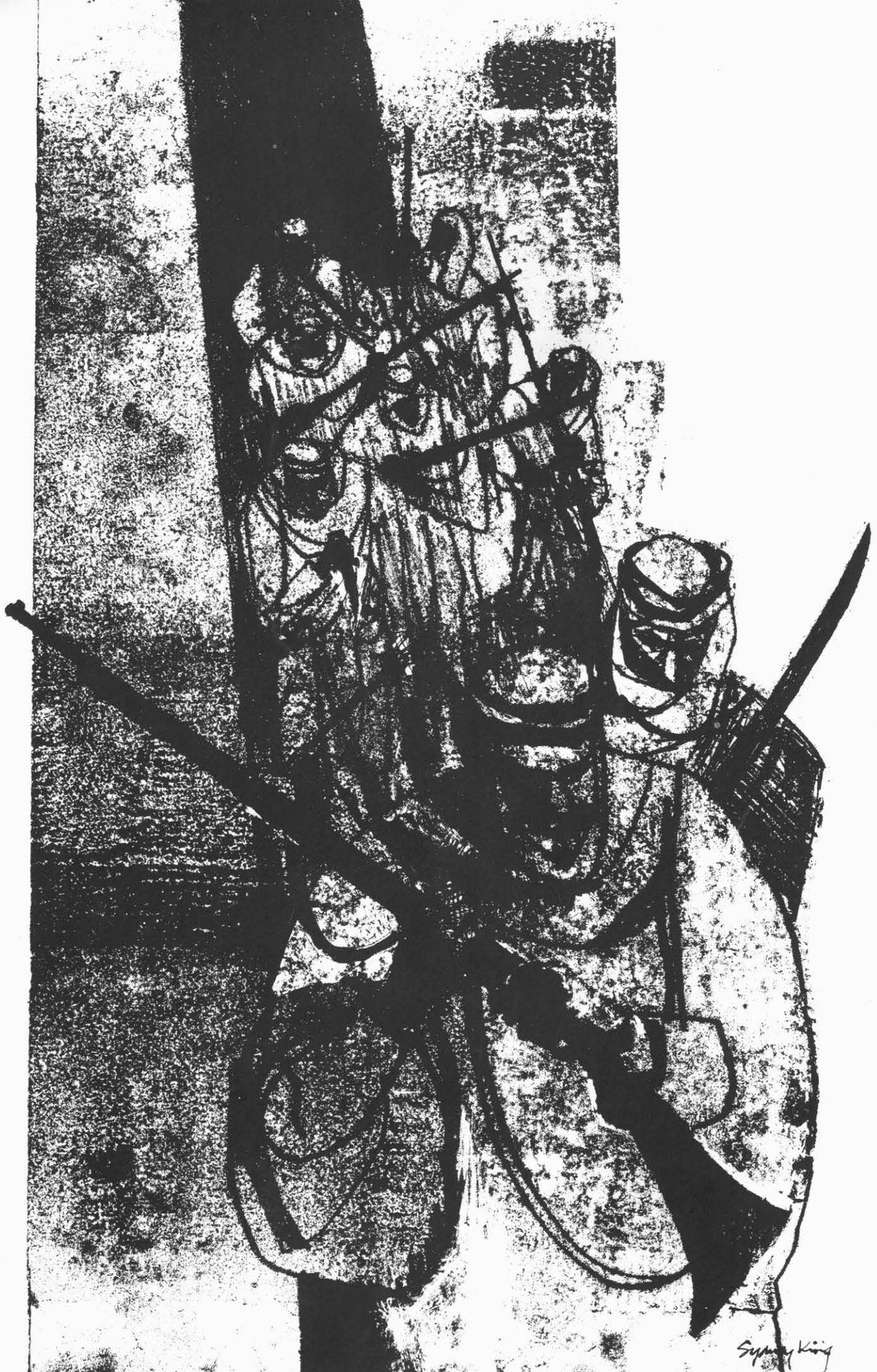
In the autumn of 1901, a column of 40 men, mounted on camels, left the town of Kuwait on the shore of the Arabian Gulf and rode westward into the desert of Arabia. By day, a green standard was carried at their head, and by night a lantern on a staff. They were led by a man of 21, conspicuously tall, and already a veteran of desert raids and wars: 'Abd al-'Aziz ibn 'Abd al-Rahman Al Faysal Al Sa'ud, the son of a royal house in exile.

In retrospect, their journey seems forlorn. The desert had always been perilous, and at that time, for them, was much more perilous than ever. Vast tracts of it had been the domain of the House of Sa'ud, but the young man's father had lost his throne through murder and trickery and battle; and for the past 11 years the desert had fallen under the sovereignty of a rival dynasty, the House of Rashid, the implacable enemies of the Saudis. Recently, the ex-ruler himself, together with the ruler of Kuwait, had organized an expedition of 10,000 men into the desert. It had ended in ignominious defeat and had proved that the nomads of the desert had lost their old allegiance to the Saudis and were willing to fight to the death for the Rashidis. So there was no place in the 700 miles of desert before those 40 men where they could hope to find comfort or safety, and any man they met could be reckoned as an enemy.

Yet they started, in the recollection of those who completed the journey, with eager anticipation. They themselves were Arabs of the desert or the desert towns and their ideals of sport were either hunting or raiding other clans. Since the fall of the House of Sa'ud, they had been confined in the coastal towns of Kuwait and Bahrain, and town life had irked them.

The men of the column expected no more than a winter's raiding, certainly exciting and probably profitable within the limits of the chivalry of the desert; but their leader had wider plans, dreams so ambitious, so youthfully romantic, and so unlikely to be fulfilled, that he did not tell anyone what was in his mind. He intended, with the

For a long half second the future of Saudi Arabia hung on a postern gate...



help of his 40 men, to recapture his father's kingdom, and—an even higher aim than wordly power—to launch a crusade.

The heads of the House of Sa'ud had not only been rulers of an area of desert; they had also been the leaders, the *Imams*, of a strict Puritan offshoot of the Muslim world: the Wahhabis. This sect was founded by a holy man of the 18th century whose name was Shaikh Muhammad ibn 'Abd al-Wahhab. He disapproved of the superstitions and luxurious living which had overgrown the Muslim creed since it was first proclaimed by Muhammad in the seventh century of the Christian era. He preached a return to the simplicity of the early religion, which had been founded entirely on the Koran (which Muslims believe to be the word of God revealed to Muhammad) and on the sayings and manner of life of the Prophet himself. For many years, Ibn 'Abd al-Wahhab's reforms attracted nobody, and he led the life of a wandering scholar, but at length, about 1750, he won the support of the Saudi ruler of his time. With wordly and religious power combined, the Saudi domain, which had been no more than a petty shaikhdom, expanded until its raiding parties covered the whole of Arabia, and its doctrines were imposed on everyone it conquered.

It was in this creed that young Ibn Sa'ud, the leader of the expedition of 1901, had had his training, and high among its precepts was the command to wage war on all infidels and heretics. Foremost among the heretics —Muslims who were not Wahhabis—were the minions of Ibn Rashid who had seized his father's throne.

The journey began with several of the enjoyable raids his followers had expected. They were traveling light, carrying nothing but their rifles, daggers, swords, ammunition, dates, flour and water. The men and their camels had been chosen carefully. So they were able to descend on the camps of nomads and the caravans of merchants, to seize camels with impunity and carry off whatever could be carried; and by night, between their raids, they were able to range the desert over distances which only the hardest riders could have traveled.

This kind of sport was almost all that the men of the expedition would have asked of life, and Ibn Sa'ud himself was not too ambitious to enjoy it. But he can only have thought of it then as an early step in fulfilling his deeper secret hope: the hope of reviving the ancient loyalty of the tribesmen and lighting a flame of revolt which would spread through the desert and the desert towns. It had never been difficult to rouse the desert Arabs to fight, either through the hope of heaven or of plunder, or simply for love of fighting; and Ibn Sa'ud may well have expected to rouse them again by a series of raids so audacious and successful that news of them would travel, spreading both fear and admiration, and offering the people of the desert the choice of joining him or suffering at his hands.

But if this was his hope, it failed. From Kuwait, he first rode west and south, into the area which had been his father's. The first of his raids were against the very tribe which had rallied to Ibn Rashid and helped to defeat his father's recent expedition. Although Ibn Sa'ud and his men were able to keep themselves well provided by capturing all the necessities of life, very few of the Bedouins joined his column, and Ibn Rashid sent major forces to try to hunt him down.

He therefore turned eastward again, into the coastal area called the Has (al-Hasa), which was then under Turkish rule; but the Turks turned out their regular troops against him. Between the Turks in the east and hostile Bedouins of Ibn Rashid in the west, he was forced to ride farther south, until he came to the edge of the fearful desert within the desert which is known as the Rub' al-Khali, the Empty Quarter: an enormous tract of barren sandhills where even Bedouins rarely travel, where camels can find little pasture and where there were no more caravans and no more camps to raid.

At one time in the forced march to the south, the followers of Ibn Sa'ud had increased to 400 men, including the slaves whom the richer Bedouins had brought with them. But as he approached the Empty Quarter, with its promise of hard living and an end to booty, the force began to melt away again until he was left with no more than when he started. Somewhere on the verges of that melancholy land, he had to admit his failure and contemplate other plans; and his thoughts began to turn to the desert town of Riyadh.

Riyadh had been his father's capital, and there Ibn Sa'ud had been born and had lived till he was ten. It was one of the least accessible capitals of the world, nearly 1,000 miles from the cities of the Mediterranean shore, 250 miles from the nearest seacoast and protected against intrusion by both the desert, which no vehicle could cross; and the predatory habits of the Bedouins. In 1901 it was a town of more than 5,000 but less than 10,000 people, of mud brick houses cramped together, a dilapidated rambling palace, a fort and several mosques, surrounded by crumbling mud brick walls and dependent on its own oasis.

At the time Ibn Sa'ud was born, in 1880, quarrels among the early Saudi rulers had reduced the kingdom to chaos and Riyadh to anarchy. It was terrorized by spies and counterspies of the rival factions and by the bloody fights that surged through the markets and alleys, fights in which the losers were hanged from the battlements.

This state of civil war made the kingdom an easy victim for Ibn Rashid, whose own domain adjoined it on the north. Between 1880 and 1890, Ibn Rashid captured Riyadh and beat the reigning Saudi several times. Even in war, however, the Arab princes were often guided by the Bedouin concept of chivalry, under which either victors or victims might ask the other, soon afterward, for hospitality and enjoy it without fear. So Ibn Rashid, each time he defeated the Saudis in battle, put one or another of them back in power at Riyadh, sometimes

alone and sometimes with a governor from among his own men to keep them in order.

But pride, and the foolishness engendered by years of anarchy, impelled the Saudis again and again into battles with Ibn Rashid and at length Ibn Rashid's fury at their intemperance drove him to break the bonds of chivalry. He ordered his governor to get rid of the Saudi family once and for all. The governor invited all the men of Sa'ud to accept greetings on a feast day, but the Saudis were forewarned, and while they were sipping coffee and exchanging polite conversation with the governor, on a signal, they butchered the governor's retainers and tied up the governor himself and threw him down a well to die. Ibn Sa'ud, at the age of ten, took part. Such was his childhood training.

But this was the end of the rule of the House of Sa'ud. Ibn Rashid, in vengeance, laid siege to Riyadh, cut down its groves of palms and poisoned its wells. The townspeople, driven by thirst and hunger, threatened to turn against the Saudis; and finally the father of Ibn Sa'ud, with his wives and a few of his slaves and retainers, carrying his children in the saddle bags of his camels, fled from the town by night, to wander discredited in the desert until he was given sanctuary by the independent ruler of Kuwait.

When Ibn Sa'ud led his weary, disheartened band to the edge of the Empty Quarter, his family had been outlaws in Riyadh since he left it in such unhappy circumstances. In the intervening 11 years, Ibn Rashid had died, but his son, who is usually known by the same family name, had kept the people of the Saudi domain under strict control. The fire which Ibn Sa'ud hoped to light in their hearts had not kindled; their spirits were damped by fear of their present ruler. Those whom Ibn Sa'ud had met in conversation, rather than battle, had made it clear that he would never win a following unless he had already been proved to be a leader. More raids were not enough; and his raids so far, rather than rousing the Bedouins, had only roused Ibn Rashid to reprisals against anyone he suspected of harboring the raiders. Two courses were left: to go back to his father at Kuwait, defeated, or else to gamble the kingdom and his life in a single master stroke which would ring through the desert. There was only one possible place for a stroke which could be dramatic enough, and that was Riyadh.

Ever since the fall of the House of Sa'ud, Ibn Rashid had kept a ruthless governor and a garrison in Riyadh, and now that Ibn Rashid knew that Ibn Sa'ud was on the warpath, it was likely that the garrison would be alert and reinforced; so Ibn Sa'ud decided to wait hidden, alone with his 40 men, in the desert, avoiding meetings with other Bedouins, until he was sure that Ibn Rashid would think he was dead.

That decision may have had a religious motive, in addition to being a matter of Bedouin tactics. The month of Ramadan was approaching, when pious Muslims fast between dawn and sunset from the day of one new moon till the day of the next. By custom, travelers are excused from the fast, provided they observe it later on; but Ibn Sa'ud's Wahhabi principles, at that stage of his career, would not have let him make use of that dispensation. Yet, on the other hand, not even the Bedouins could lead an active life of hard riding in the desert while they were fasting; and besides, an attack on a town during Ramadan was foolish, because many citizens who fasted all day stayed up all night.

The wait was a harder test of his leadership than the raiding. From the traditional moment before each dawn when a black and a white thread of cotton could be distinguished, until the sun was below the horizon again, his men had nothing to eat or drink, and nothing to shelter them, and worst of all they had nothing whatever to do; and even at night, when the strictest of Muslims can make up for the day's distresses, they had no women and no comfort and no more than a mere starvation ration. At the end of Ramadan, by argument, persuasion and threats, and by putting the men on oath to follow him to whatever death he chose, Ibn Sa'ud still had the faithful 40 with him; but perhaps nobody ever searched the sky more eagerly for the first sight of the new moon. As soon as it was seen, he gave the orders to saddle the camels and march.

Riyadh was more than 100 miles away. Released from the dangerous boredom of the Empty Quarter, they rode out on a raid which became in later years a legend in modern Arabian folklore, and a story which Ibn Sa'ud was often asked to tell. While the end of Ramadan was still being celebrated by more peaceful people, they approached the town by night and concealed the camels, and continued on foot through the groves and gardens, silently in the darkness. When they came within sight of the walls he halted, and chose six men to come with him; and he told the others to wait till midday, and then if they had heard no news of him, to escape if they could and take the camels and ride to Kuwait, because by then he would either be victorious or dead.

Ibn Rashid had neglected the walls of Riyadh, and Ibn Sa'ud and his six companions scrambled over them, using a palm trunk as a scaling ladder, and entered the sleeping town without alarm. They were surprised to make their way in so easily, and Ibn Sa'ud had not thought what to do next; he believed his cause was God's and that God would guide him. But he led his men into the alleys he remembered from his youth. They were hushed and empty. In the center of the town the Rashids had built a fortress, and opposite the fortress gate, across a square, they had fortified a house where the governor, whose name was 'Ajlan, kept his women. Both of these strongholds were locked and barred, but next to the women's house there was another which belonged to a seller of cattle called Juwaysir. Ibn Sa'ud knocked on his door, and after a while a girl's voice answered: "Who are you?" And he remembered that Juwaysir had two daughters.

"I am sent by the Amir 'Ajlan," he said through the closed door. "He wants to buy two cows. I have to see your father."

The girl said: "You should be ashamed, son of a woman accursed. Does anyone knock on a woman's door at this time of night? Go away."

"Be quiet," Ibn Sa'ud said. "In the morning I shall tell the Amir and he will rip your father open."

This gruesome and plausible threat was heard by Juwaysir, and he hastily opened the door and Ibn Sa'ud seized him and scared him into silence. The daughters recognized the son of their exiled ruler and began to cry out a greeting, but he bundled them into the house and told his men to shut them in a cellar. In the moment of confusion Juwaysir escaped and ran away.

By then, the raiders had made a simple plan: to go up to the flat roof of Juwaysir's house and jump to the roof of 'Ajlan's and force an entrance there. But the gap was too wide. Instead, they jumped to another house, where they found a man in bed with his wife, tied them both up in their bedclothes, gagged the wife, and threatened them both with death if they made a sound. Then they waited, to see if Juwaysir had given the alarm. But the town remained silent. Ibn Sa'ud sent two of his men to bring in the rest who were hiding in the palm groves.

'Ajlan's house was a story higher than the others. They climbed on each other's shoulders, forced the roof door open and crept through the house, seizing the slaves of the household one by one, until they came to the bedroom which seemed to be 'Ajlan's. Ibn Sa'ud went in with his rifle; another man followed with a candle. There were two mounds in the bed, and he peered at them—but neither was 'Ajlan; one was his wife and the other was her sister. He unloaded his gun and prodded them, and they jumped up screaming. "Enough," he said. "I am 'Abd al-'Aziz."

'Ajlan's wife was a Riyadh woman and knew him. "What do you want?" she asked in terror.

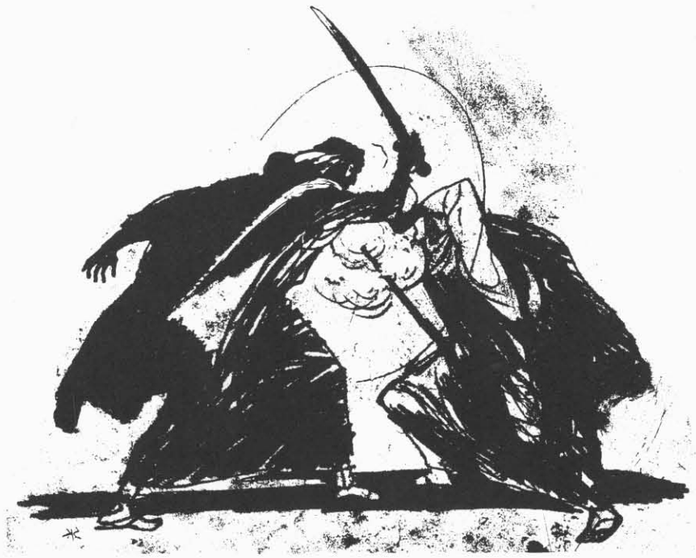
"I want your husband, shameless woman, you who have taken a Rashid."

"I am no shameless woman," she said. "I only took a Rashid when you left us. What brings you here?"

"I have come to look for your man to kill him," he said.

"You may kill Ibn Rashid and all his people," she said, "but I could not wish you to kill my husband. And how can you deal with him? He sleeps in the fortress, with 80 men, and if he discovers you, you will never have the power to save your souls and escape from the country."

Ibn Sa'ud asked her when 'Ajlan would leave the fortress. "He will not come out until after sunrise," she said. The raiders locked her up with her sister and the slaves, broke a hole in the soft mud wall and brought the rest of the party in from the house next door. Then they settled down to rest, ate some dates and drank the governor's coffee, slept and prayed and wondered what they should do. They had come too far to retreat.



During that vigil while they waited for the dawn, their only thought was to lure the governor into the house and kill him there. With that in their minds they chose one of the men who was small enough, dressed him in the woman's clothes and left him to let 'Ajlan in when he knocked.

The others went up to a room above, where there was an opening from which the gate of the fortress could be seen across the square. It was a heavy studded wooden door with a very small postern in it, only two feet high, so designed that a man could only go through it head first, exposing his neck to the sword of the keeper inside.

After the call to prayer from the mosques of the town, when the raiders hidden within the house performed their own devotions, and as the morning light refilled the square, the gate was opened, and servants began to bring out the governor's horses. The sight of the open gate was too much for Ibn Sa'ud. He jumped to his feet and ran downstairs, determined to rush it, shouting to some of his musketmen to cover him from the window. But while he was going down, 'Ajlan himself emerged with a dozen men, and the gate was closed behind him.

The fight was merciless. Ibn Sa'ud flung open the door of the women's house and charged across the square. 'Ajlan and his followers turned at the sound, and seeing him, the followers ran for the fortress gate and bolted through the postern one by one. When Ibn Sa'ud reached it, 'Ajlan was left alone. He had drawn his sword; Ibn Sa'ud had nothing but his rifle. 'Ajlan made at him, sword raised to strike. Ibn Sa'ud covered his face with his arm and fired his rifle point-blank, singlehanded, heard the sword clatter on the ground and knew he had wounded 'Ajlan. 'Ajlan plunged at the postern, Ibn Sa'ud caught his legs, and his own men pulled his arm. 'Ajlan gave Ibn Sa'ud such a kick in the stomach that he started to faint and let him go. For a half second then the history of Arabia hung on the postern gate. Before the defenders could slam it shut, a cousin of Ibn Sa'ud named 'Abd Allah ibn Jiluwi thrust himself into the hole and wriggled through. In the narrow gateway within, the defenders were too confused to decapitate him as he came, and he laid about him with his sword. Others followed and threw the main gate open, and the rest of Ibn Sa'ud's warriors swarmed in and started a bloody fight, outnumbered two to one, through the courtyards and towers of the fortress. They slaughtered half the defenders. Some fell or were thrown from the battlements. Ibn Jiluwi cut 'Ajlan down and killed him. Nearly 40 surrendered and were locked in their own dungeons; and before the morning ended, Ibn Sa'ud sent his men through the town to proclaim that God's will had been done, and the House of Sa'ud was master again in Riyadh.

David Howarth, former war correspondent and producer for the B.B.C., is the author of We Die Alone *and three other books on World War II, and editor of the 1961 autobiography of the Dalai Lama of Tibet. This article is a condensation of the first chapter of* The Desert King, *a biography of the late King 'Abd al-'Aziz, published by Collins of London.*

MONUMENTS OF THE NILE

BY TOR EIGELAND

Threatened by the rising waters of the artificial lake being created by the Aswan High Dam, the great temples of Abu Simbel, most famous of all Nubian monuments, will be cut into 30-ton pieces, hauled up 200 feet and reassembled at the top of the cliff. This operation, planned by Italians and being executed by West Germans is sponsored by UNESCO and will cost $36,000,000. The temples were begun by Seti I and completed by Pharaoh Ramses II, approximately 3,200 years ago. These four sitting statues at the larger of the two temples are each about 65 feet high, hewn out of sandstone and depict Ramses II.

In travel circles a few years ago the word spread quickly: "Abu Simbel is in." Sophisticated travelers galloped off to their travel agents and demanded immediate passage to the Nile Valley. The rush to Abu Simbel was on.

The temples at Abu Simbel, one dedicated to Ra-Horakhti, god of the rising sun, the other to the goddess Hathor, with their enormous figures hewn out of cliffs beside the Nile, had always been among Egypt's more impressive sights. Then, as preliminary work on the Aswan High Dam neared completion, the world press discovered that they were about to disappear beneath the rising waters of the irrigation lake that the dam would create. Published reports to this effect, accompanied by spectacular photographs of the great monuments, stirred world-wide demands that the monuments be somehow preserved. From all quarters there came suggestions on how that could be accomplished. Some were absurd, many were sound. Debates over the plans kept a steady flow of publicity and information pouring out of Egypt and a steady flow of visitors pouring in.

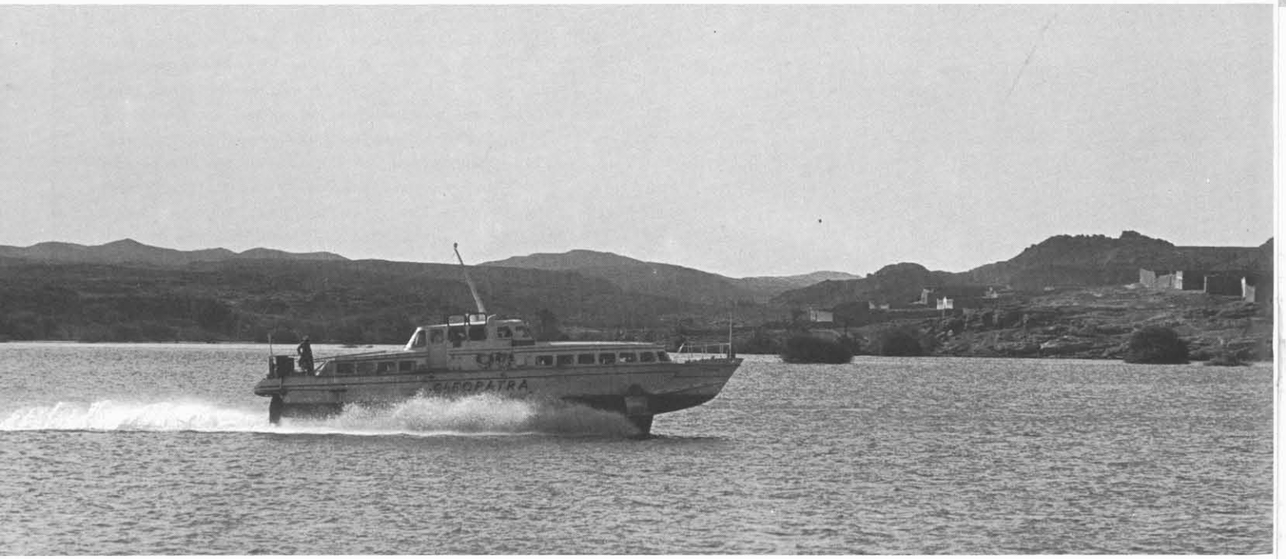
By the time UNESCO decided on a plan which apparently will save the monuments—by cutting them out of the cliff and hoisting them to another site on top—Abu Simbel was almost as familiar as the Eiffel Tower. Thousands of visitors, many roaring up the Nile in swift hydrofoils, traveled from all over the world to catch one last—and first—look. They found their own way of preserving the temples—on color slides, most of them excellent since Egyptian sunshine is particularly clear and the statues stay nice and still.

Justified though it may be, there is an amusing side to this sudden wave of attention. The temples at Abu Simbel, magnificent as they are and have been for more than 3,000 years, are only two of the many wondrous treasures in what could rightly be called the world's largest, oldest and most splendid outdoor museum. They are, moreover, temples that in size, weight, beauty and archeological significance simply do not compare with some of the other major monuments exhumed from the ruins of ancient Egypt's lost civilizations.

Those monuments are, unquestionably, familiar. Who could not recognize the Pyramids or the Sphinx of Gizeh, or perhaps the Colossi of Memnon? But are they less majestic for that? There they stand as they have, not merely for centuries, but for millennia, a record in stone written on that narrow tablet of sand stretching some 900 miles from Cairo to Aswan. There are the step pyramid of King Zoser, once the world's largest man-made structure; the Temple of Luxor in the heart of what was once ancient Thebes; the Temple of Amon at nearby Karnak, guarded impressively and eternally by rows of ram-headed sphinxes. Across the river to the east are the subterranean wonderlands of the City of the Dead, the Valley of the Kings, the Valley of the Queens, the Tombs of the Nobles. In this area, too, is the tomb of Tutankhamen, discovered in 1922 in all its unspoiled grandeur and with its fabulous treasures untouched.

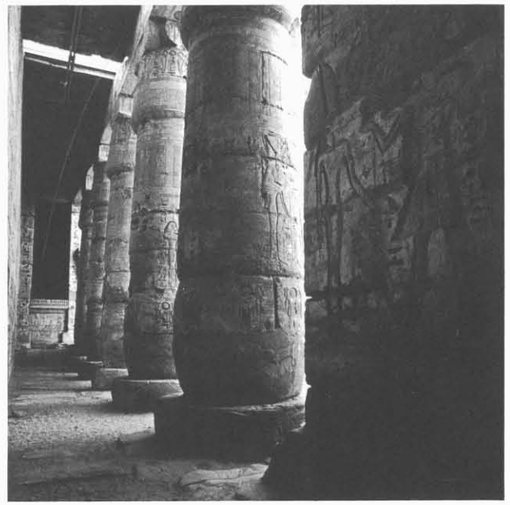
This is the Egypt that was there long before Abu Simbel assumed its unique but transient fame. This is the Egypt that will be there long after the great figures have been hoisted to their new eminence above the great lake now forming at their feet, and long after the fashionable rush has slowed to the normal pace of the timeless Nile.

Not far from the site in Memphis where the huge statues of Ramses II were found (see p. 15), an alabaster sphinx was discovered in 1912 in a good state of preservation. It was 26 feet long and 13 feet high, and weighed 80 tons. Like most of the Egyptian sphinxes, it depicts a pharaoh in his divine role of the sun-god Ra—with a human face but the body of a lion—though there are also sphinxes with the face of a ram or a hawk. In Greek mythology and art the sphinx was a winged monster with the head and the breasts of a woman and the body of a lion.



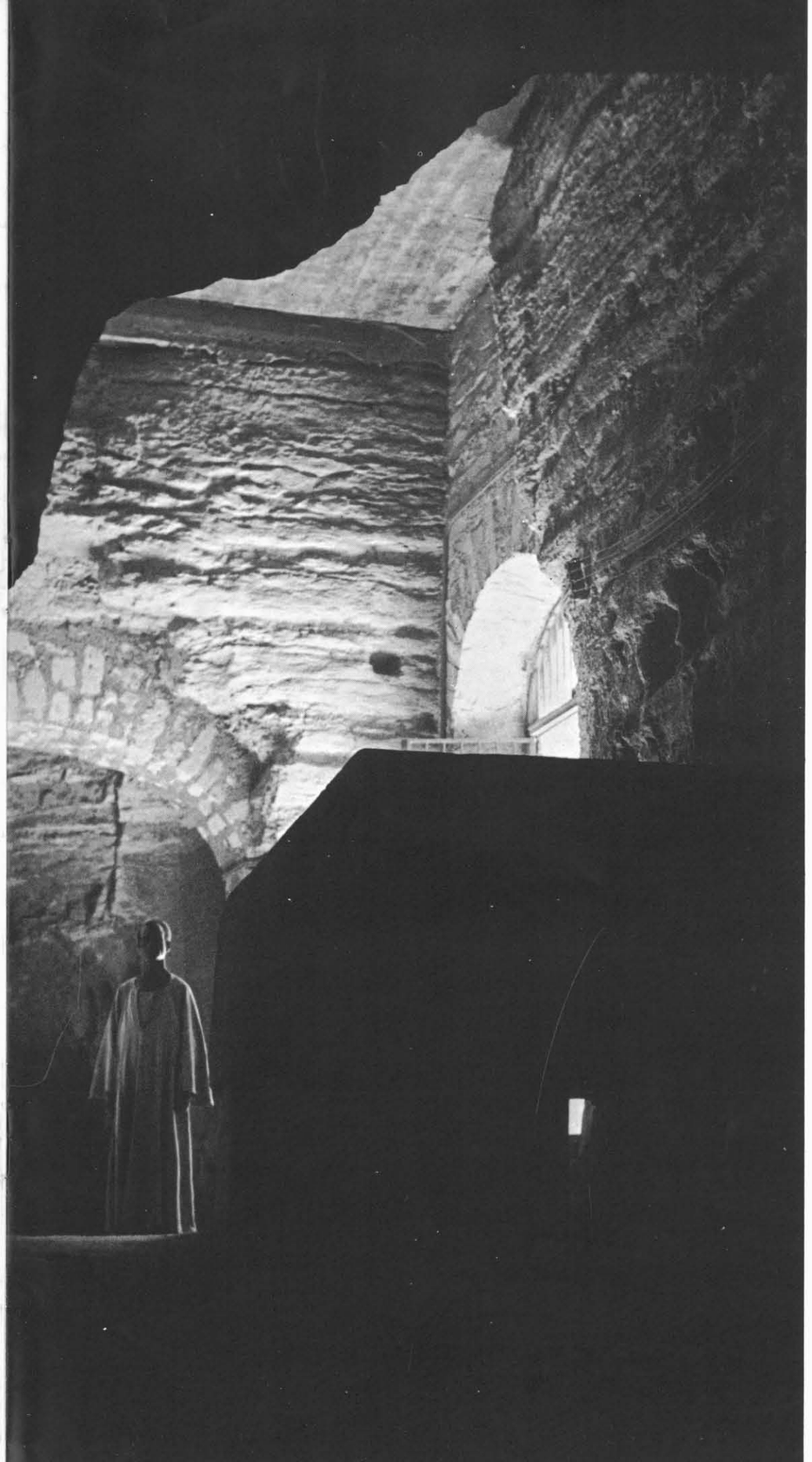
Fastest craft to ever navigate the Nile is a government-owned hydrofoil which maintains, during the winter months, a daily service for tourists and other passengers between Aswan and Abu Simbel in the south, a distance of approximately 170 miles.

One of the New Kingdom temples in the Thebes area is Medinet Habu, built by Ramses III. Facing southeast, it has a length of 503 feet and a width of 160 feet. Its enclosure contains both a palace in the form of a stronghold and a sanctuary. Externally the building is not particularly beautiful, but internally are many specimens of painted sculptures depicting the pharaoh's victorious battles against Libyans, Syrians and others. In their richness and splendor, they are of great value to students of Egyptian history.



There are many sphinxes in Egypt, and indeed elsewhere in the Middle East and Greece, but the largest and most famous of these mythical beasts is the Great Sphinx of Gizeh, near Cairo; it is also the largest piece of sculpture ever carved by human hands. Finished about 2640 B.C., it is 240 feet long and it has the face of King Chephren who, upon his death, became the symbol of the sun-god Ra. The sphinx guarded the western passage through which the sun and the dead disappeared.

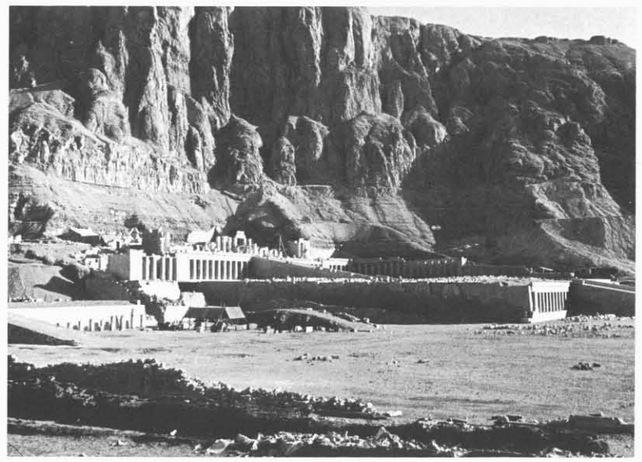
Oldest of all pyramids in Egypt is King Zoser's remarkable step-pyramid at Saqqara, southwest of Cairo. It was built 100 years before the Great Pyramid at Gizeh. Traditionally kings in those days were buried in mastabas, burial chambers resembling houses. King Zoser's grave was originally also a mastaba, about 25 feet high, but it was later enlarged. A 4-step pyramid was built on top of the mastaba and then that was enlarged to a 6-step pyramid, 200 feet high. It was not only the largest man-made structure in the land, but also the first made entirely of stone.



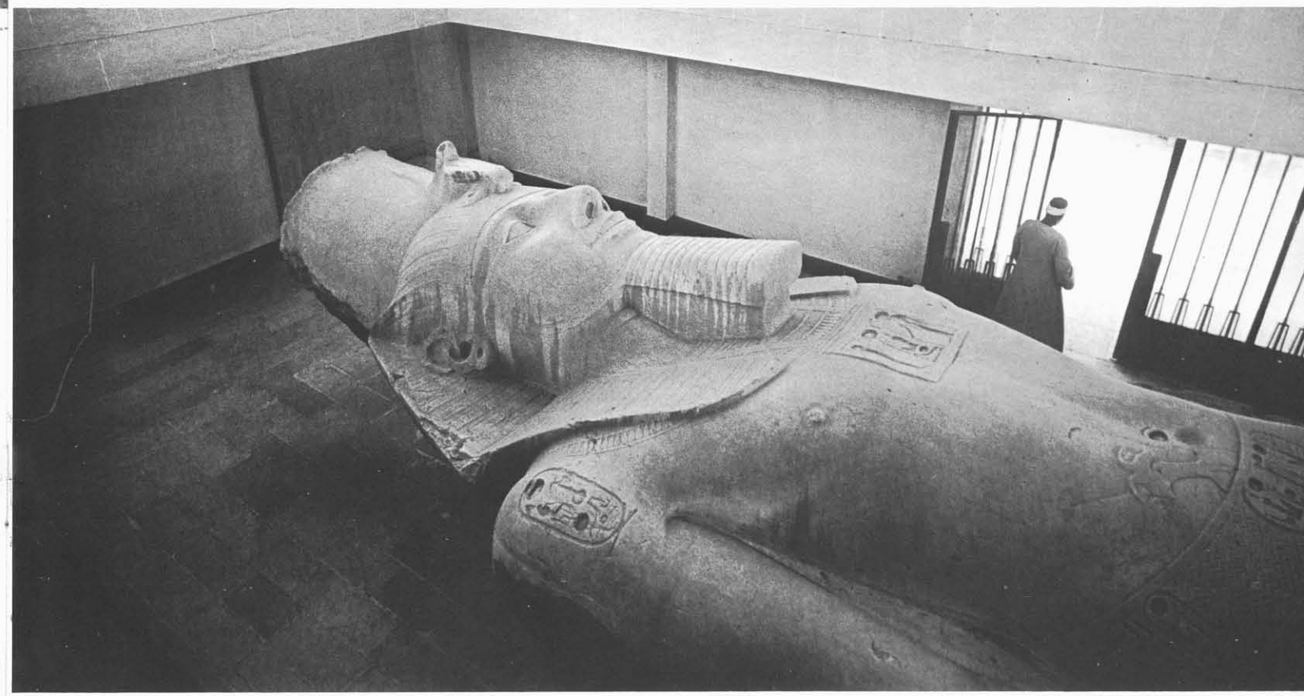
The Separeum at Memphis is the vast underground gallery where the Pharaohs buried the Apis, or sacred bulls. These catacombs house dozens of granite and basalt sarcophagi or coffins, the heaviest weighing almost 70 tons. Each has its private side-hall off the main passage. Outside nearby is the place where the bulls were prepared for mummification and burial. The Apis, according to historians, were not allowed to die a natural death. They were killed, partly consumed at a ritual feast, and the remains mummified and ceremonially buried.

A crocodile ready to devour a baby hippopotamus being born, is one of the bas-reliefs inside the rarely photographed tomb of Princess Adut near Unis' pyramid at Saqqara. Most of such decorations in those days were in stone, and colors were seldom used, probably out of fear that they would not last forever. The religious belief of that period held that the happy afterlife of the deceased depended a great deal on the depictions, in the most durable materials, of scenes which happened during his earthly existence.

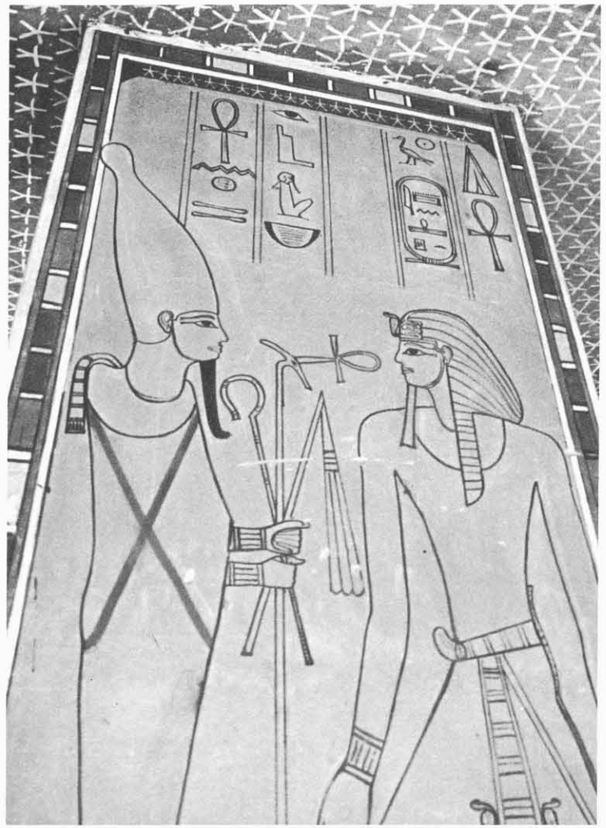
The magnificent temple of Deir el-Bahari near Nag Hamadi stands at the foot of the rugged Theban hills in a recess of the desert wall. Built as a funerary temple for the famed Queen Hatshepsut (18th dynasty) and designed by one of the Queen's advisers called Senemut, it has an enormous processional ramp leading up to two successive spacious terraces and a columned court and then into the main sanctuary cut back into the cliff. Originally the terraces were planted with rows of palms and other trees and plants brought in from distant lands.



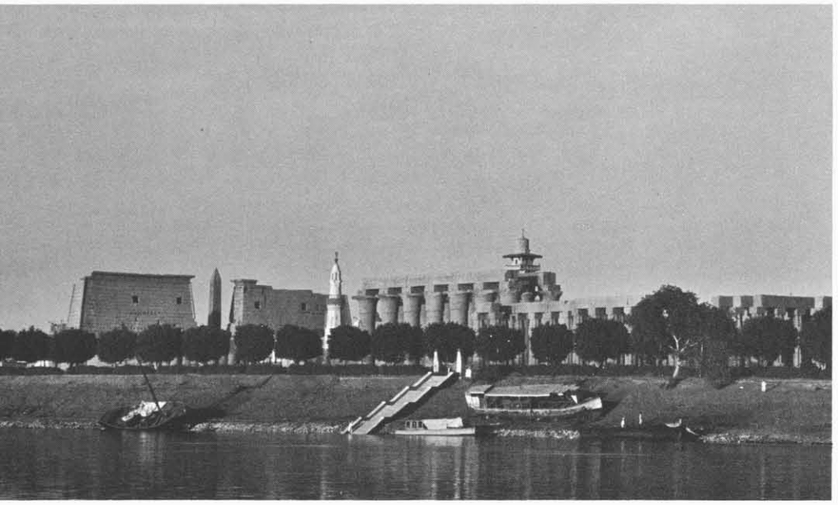
Looking out over the fertile fields west of Luxor, across the Nile, are the two colossi of Memnon. These gigantic seated sandstone figures are almost the sole remains of the huge temple of Amenhotep III who was all-powerful from 1405-1370 B.C. The legend that the colossi represented the Trojan hero Memnon grew up many centuries later. Time truly seems to have stood still here. The farmers till and irrigate their land and guard their flocks the way their forefathers did, safe beneath the perpetually alert presence of the colossi.



King Ramses II, "The Great," who reigned from 1292-1225 B.C., held court at Memphis. Practically nothing is left today of the splendid white-walled city, the site of which is about 16 miles southwest of Cairo. At Memphis two giant statues of Ramses II, a great builder who left monuments all over Egypt, were found. The one pictured here, originally 44 feet high when standing, is enclosed in a special hall built around it. Its condition is such that it cannot be restored to either a sitting or standing position.



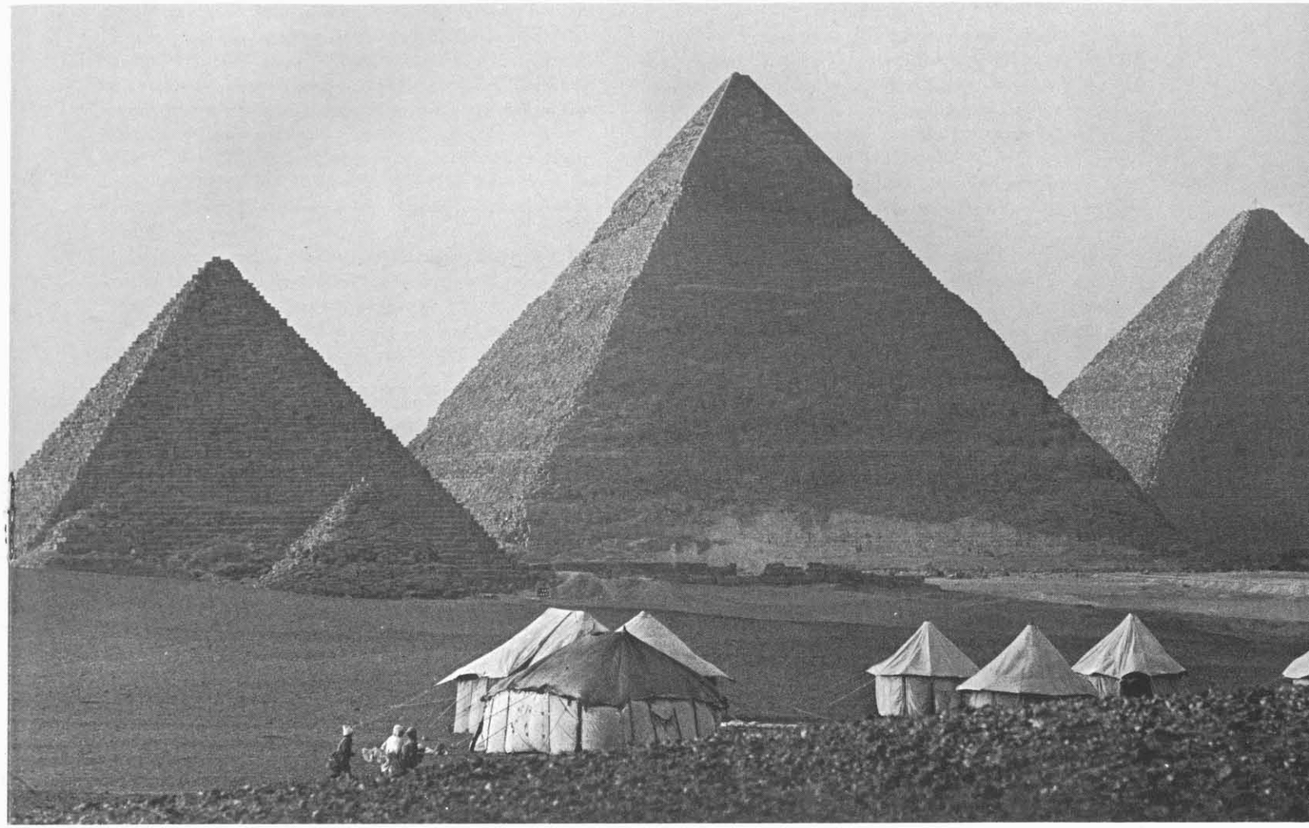
As soon as a new ruler came to the throne in old Egypt, he selected a site for his future tomb. Remains of the mortuary temple of Amenhotep II, who reigned from 1450-1425 B.C., were found in West Thebes, but his tomb in the Valley of the Kings is well preserved. Nine mummies and a list of gods and spirits, containing 504 names, were among the subjects found in it. Amenhotep, who, or so he said, was a great athlete and warrior (historians call him a cruel and bloodthirsty man), is shown here with Osiris, god of the Dead.

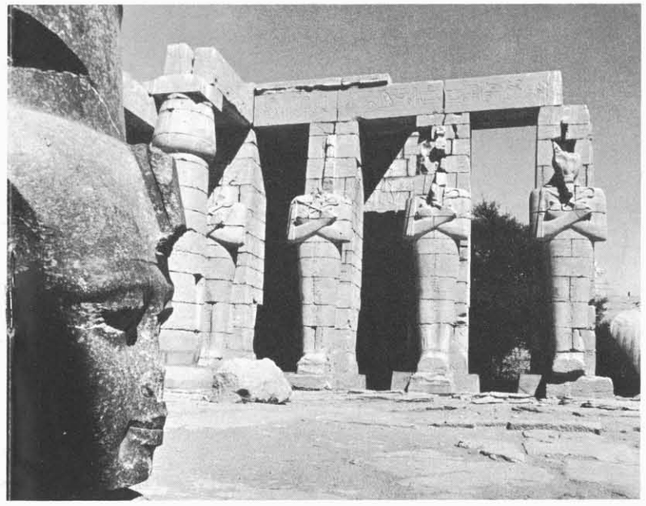


Most famous pyramids of all are those at Gizeh near Cairo. There are three there and the one finished in 2680 B.C. by Khufu—also called, by the Greeks, Cheops—founder of the fourth dynasty, is the largest. Its original height was 481 feet, but it is now only 450 feet. An estimated 100,000 men worked three months each year for 20 years to build it, using 2,250,000 blocks of solid stone, each averaging two and a half tons in weight. Whether visited by day or by night, the pyramids are always an overwhelming and unforgettable spectacle. →

Luxor Temple, built on the site of a chapel to celebrate the New Year feast, was erected by Amenhotep III and dedicated to the god Amon, his wife Mut, and their son, the moon god Khensu. Tutankhamen and Ramses II altered and enlarged, though not always improved, the temple, which in its original form was severe of design and 623 feet long. Of the two fine granite obelisks, one was taken to Paris where now it is the famous landmark of the Place de la Concorde. From Luxor Temple to Karnak Temple an avenue of sphinxes is presently being excavated.

From Luxor it is only a brief ferry ride across the Nile to the City of the Dead, the Valley of the Kings, the Valley of the Queens, and the Tombs of the Nobles. There one finds also the Ramesseum, the mortuary temple built by Ramses II and dedicated to the god Amon. It is mostly in ruins, but even its remains are impressive. On the western side is the broken, giant statue of Ramses, made from one single granite block and weighing more than 1,000 tons. Once the largest statue in all Egypt it was smashed by King Cambyses of Persia—in itself quite a feat. →

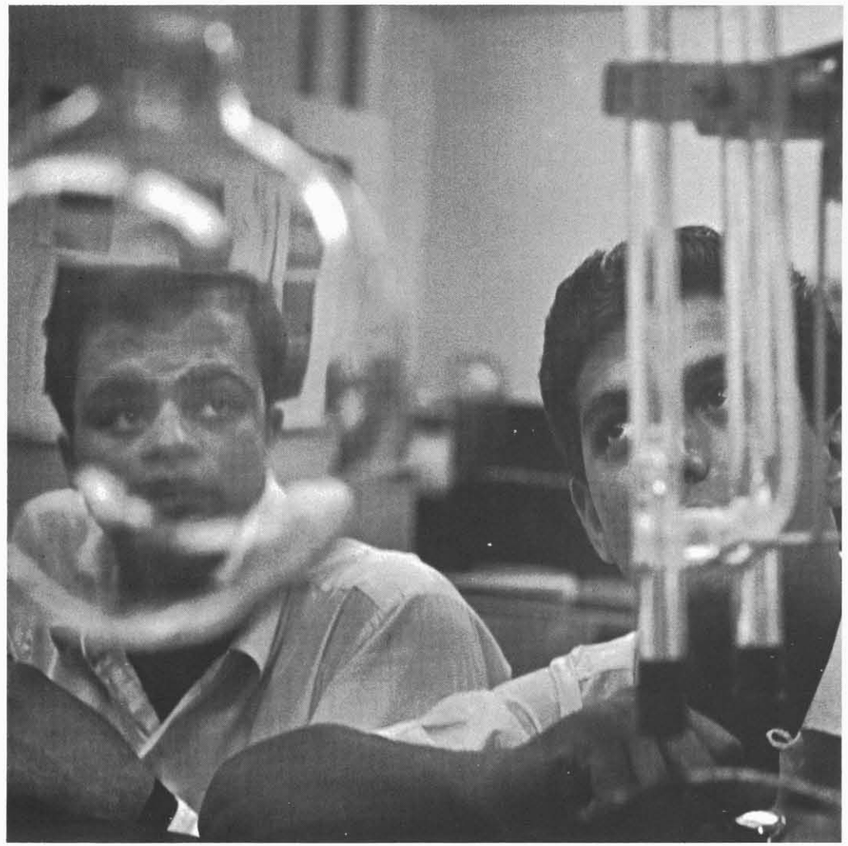




Tor Eigeland, a professional photographer who has handled assignments in Africa, Japan and Southeast Asia, was born in Oslo, Norway. After trying a number of occupations in Canada and earning a college degree in Mexico he became an American citizen and in 1958 turned to photography.

BY WILLIAM TRACY

Two students in the Industrial Training Center laboratory in Dhahran await the outcome of an electrolysis experiment.



In the classrooms of the Industrial Training Centers, Aramco workers find...

In a brightly lighted classroom on the second floor of the gray brick building down the hill from Dhahran's hospital complex, some 15 students raised their voices in a curious, clipped chant: "*Peter* went to the meat market this morning. Peter went to the *meat market* this morning. Peter went to the meat market *this morning*." After a pause for a brief word from a teacher they began again, practicing in unison the differing inflections by which the English language achieves much of its emphasis: "*Peter* went to..."

Next door another group of students discussed the lives of famous people. "It seems to me," said one, "that Florence Nightingale was one of the few who really cared. Even though women at that time were not supposed to be in such places or see such sights, she went anyway and ..."

Downstairs, a teacher in rimless glasses asked for the square root of 1,521 and nodded at a student whose hand shot up immediately. "It's 39," said the student, and went on to explain how he had arrived at the answer so quickly. "Since 40 times 40 is 1,600 it seemed logical to try one figure less, particularly since multiplying the last nines gave at least one correct figure as a check ..."

In a fourth room, students, one by one, ran through a list of word combinations designed to develop a mastery of those subtle distinctions which an Arab tongue frequently finds difficult to handle: sell ... sail, seek ... sick, peel ... bill-no, pill! ..."

In the hallways outside the classrooms the voices could be heard rising and falling in an odd and sometimes amusing medley: "the *meat market* ... brought her nurses and told the doctors ...find the square root of any number it is necessary to ...seek... Peter...doctors... sell..."

It is a low steady sound, that medley, and one familiar to Dhahran, Abqaiq and Ras Tanura, all bases for operations of the Arabian American Oil Company (Aramco) in Saudi Arabia. Each of the communities has its own Industrial Training Center, a tangible expression in steel and stone of an Aramco policy: for all Saudi employes, an opportunity for training to the extent of their job needs and personal abilities.

That policy, instituted many years ago and maintained since, is not as optimistically idealistic as it sounds. To the contrary, it is a policy tested and found sound by years of experience—experience with men like Muhammad Hassan al-Mussah, an Aramco personnel advisor who delights in telling, in flawless English, what he did when *he* got *his* chance.

"That was in 1943," he begins with a smile. "I went to work as a laborer for Aramco in Dhahran. The next year I took up tea drinking."

He pauses for the inevitable "why?" and then explains. "Not many men knew English then and I knew it would be valuable for my job in the future, so every evening I'd prepare a pot of tea with lots of sugar, the way Arabs like it, you know? Then I'd invite four or five friends over who could speak at least some English, and with every cup of tea I'd serve a question in English."

Muhammad pauses at this point and grins. "At first, of course, we mangled the language, but we didn't let that bother us. It wasn't *our* language, after all."

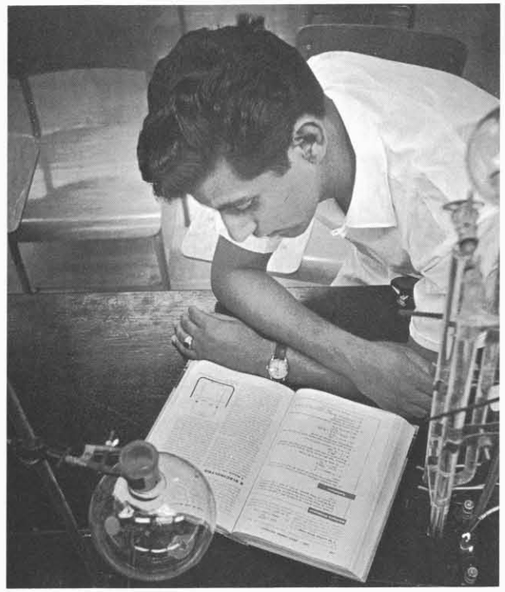
Another story is told by Hassan Abdul Wahab, a graduate of Muhlenberg College in Pennsylvania and host on the Aramco television program, "Your Health." In 1943, just about the time that Muhammad was taking up tea drinking seriously, Hassan decided to go to school. He was only 11 years old then, but one morning he climbed into a donkey cart in Qatif, rode some 20 miles to Dhahran, walked six miles to al-Khobar and then caught a boat back up the coast to Ras Tanura—all to start the school term.

To men like that, obviously, opportunity is all that's needed. Aramco, recognizing that fact, began to establish the training system which in one form or another has offered that opportunity to employes for 20 years and which today has finally developed into what are formally called Industrial Training Centers, and, informally, "ITC's".

The ITC concept is that training and work must be closely linked. If that were the extent of it ITC could probably be dismissed as no more than a successful vocational improvement program; the ITC system, however, is much more than that. When considered in combination with its companion, Industrial Training Shops (ITS), it provides the advantages of several programs of education offered separately in the United States: academic schooling, vocational training and adult education.

Years ago Aramco carried a much larger share of the educational load than it does now. Then it offered elementary and secondary schooling to students and also participated in a government-sponsored "Campaign Against Illiteracy," in effect an Adult Education Program for illiterate workers. As the Saudi Arab government expanded its own educational program in most areas to offer 12 years of elementary and secondary education to both boys and girls—as well as a commercial and industrial curriculum of 10 years—Aramco gradually raised its hiring requirements so that a present-day applicant for work must have completed a minimum of nine years in government schools. Once hired, however, he is given a placement test to determine what special supplementary training might benefit him for his particular job. If it appears to his immediate supervisor that he and the company can profit from a period of

A PATH TO PROGRESS



'Abd al-Ghani al-Bayyal, now in college, studied physics in an ITC last year.

additional training, he is assigned to the ITC nearest his job which not only costs him nothing, but carries with it the same pay and benefits as if he were working at his job.

The matter of report cards is unique. They go, not to parents, nor to himself, but to his supervisors. Behind this is the logical belief that since it is the employe's own section or department which will make use of his increased training, the immediate supervisor ought to check his performance, advise him and, if necessary, give him a push. Job supervisors, in fact, do much more than that. Key men in the ITC operation, they are expected to keep an eye open for promising employes and take the initiative in assigning them to school whenever warranted. This interplay between man and supervisor was accurately summed up by two trainees in this brief dialogue: "Our opportunities in training depend a lot on what our supervisor decides," said one man. "But," added another immediately, "what your supervisor thinks usually depends on what you do."

Most of these training assignments are for one to two hours a day, but if the worker is a particularly promising man and his job, or the job for which he is being considered, is sufficiently demanding, he can be assigned to the school full time—at least four hours of classes plus another four hours in the library working on the heavy homework load. Such full-time trainees usually alternate periods of study at the center with equal periods on the job so as not to lose touch with their department and defeat the whole purpose of their training.

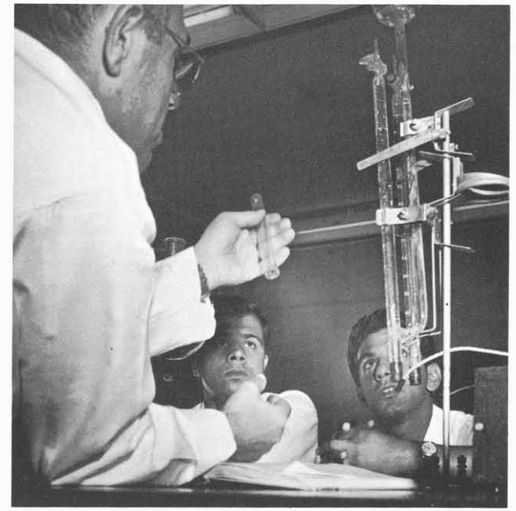
Supervisors do not take that kind of responsibility lightly. Each summer all of them go over their workers' records with ITC registrars or principals.

By such conferences and by considering the results of tests—some 2,000 were given each trimester last year—supervisors can compile a full progress report which goes on the employe's permanent personnel record. For a passing grade in ITC a worker must hit 70, but for upper level trainees, the requirements are stiffer. Even so, the failure rate is only 11 per cent. Failing students, however, usually re-enroll to make up their work in evening classes on a voluntary basis and about 79 per cent of those doing so succeed the second time. They might choose to study on their own, and tutoring is available during vacation periods, but this usually isn't recommended because of the lack of valuable classroom discussion. At ITC there are as many volunteers as there are assignees. Furthermore, there are no restrictive school hours; the centers are open from 7:30 in the morning until 8:00 at night.

Occasionally, a supervisor might receive a deficiency report based on poor preparation or excess absences, but for the 1,100 students enrolled last year, only 70 such notes were needed. In fact, most of the students display the kind of motivation and seriousness of purpose that every teacher always hopes to see, and rarely finds. In addition to the simple desire for study found in many of the men who went to work at an early age, those with several years' service with the company have the incentive of wives and families to support. They know that their classroom performance might be a stepping stone to a better job or a bigger paycheck. They know because all they have to do is look about them at some of the men who have gone through an Industrial Training Center.

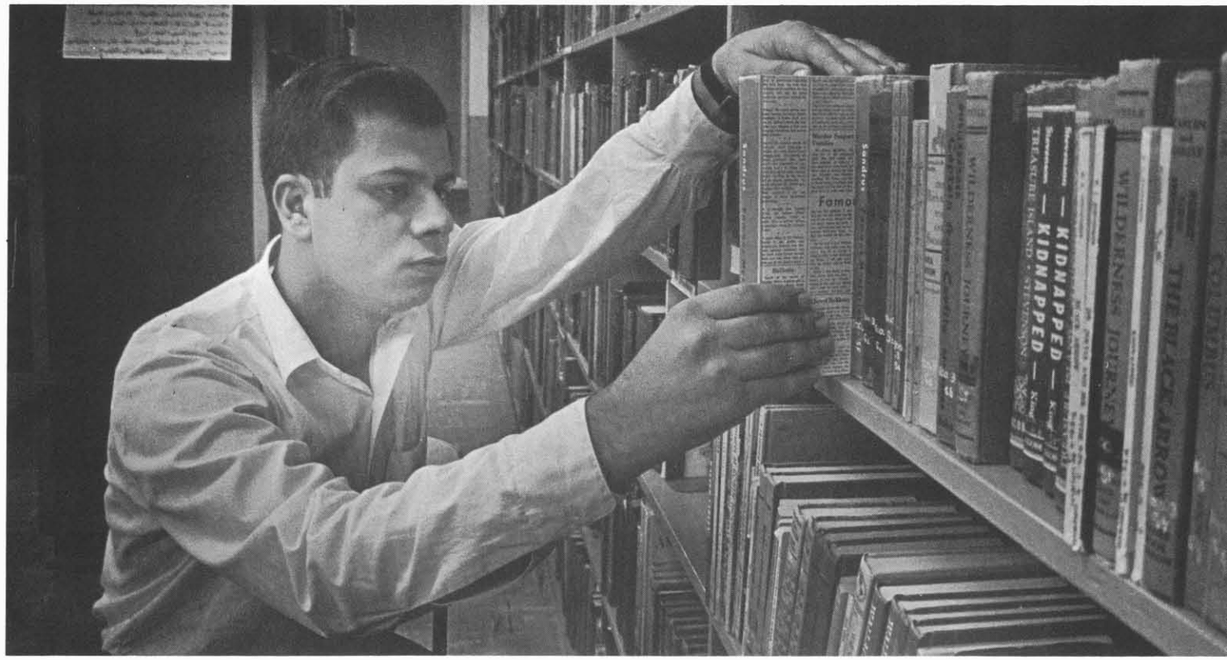
One such man is Sulayman Rubaya, now a teacher in the Dhahran ITC. Eighteen years ago he was himself a trainee. Today he holds an A.B. degree in education from the American University of Beirut, in Lebanon. Another is 'Ali Qahsan, a married student with two children who moved to Beirut last fall to begin studies at the International College. Then there's 'Abd al-Ghani al-Bayyal, a handsome bachelor of 23 who wears a starched uniform with a medical department insignia on the collar. He, too, is in Beirut where he's bearing down on science. And there's also Mansur Ahmad Simbel, who has been with the company 16 years. After studying basic electricity, he moved up the ladder to the Dhahran television station, and is slated for the Williamsport Technical School in Pennsylvania where he will study electronics and TV repair.

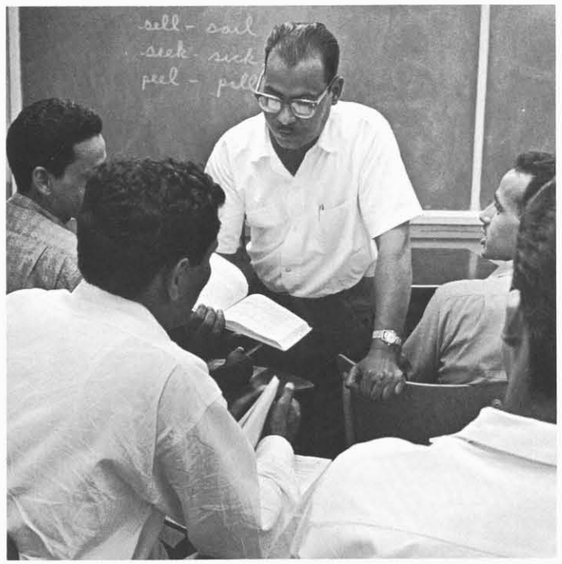
And there are others too: Muhammad Husayn al-Yusuf, whose summer job back with Aramco last year counted toward the degree he's now working for under the Antioch (Ohio) University cooperative program; Muhammad Kurnas, who transferred to the Oil Operations Department as a boy because he felt that it offered the best opportunity, and is working there today after earning



Teacher Emile Wehbeh gives laboratory demonstration for Saudi students.

Muhammad Zaynal, a 7th-level student, browses in the library. Muhammad must still complete another year of English studies to be eligible for schooling abroad.





Teaching English is Sulayman Rubaya who joined Aramco 18 years ago.

Countless employe-students have passed through the classrooms of Dhahran ITC.

Cole Nice teaches reading comprehension to students with color-keyed cards.

an A.B. degree in chemistry from Earlham College in Indiana; Sayf Husayn, who didn't give up when he had a "sophomore slump" at college, but took a year's leave of absence from the company and continued on his own; or the Saudi Arabian Airlines jet pilot, who, as a boy with Aramco, used to sit in class and day-dream about airplanes.

These are the men who give ITC its reputation in Aramco as being a path to progress—these men, and the staff of first-rate instructors who are the heart of the program and form an international group. In the Dhahran center, for example, there are five Saudi Arabs, six Americans, and 26 other Middle Easterners from Lebanon, Jordan, the United Arab Republic and Sudan.

Courses are carefully geared to industrial needs, but the range of subject matter open to the ambitious employe is limited only by the time and ability of the individual worker. In mathematics, a 74-month program is offered, in eight levels. Arithmetic, algebra, geometry and trigonometry are all taught. In Arabic, the 72-month course follows the Saudi Arab government curriculum closely. The 45 months of science include elementary science as well as general science, biology, chemistry and physics. In the science laboratories many students learn the theoretical principles behind the phenomena they've observed on a practical basis at the hospital, the power plant, the refinery, or the oil operations lab.

Business courses include commercial mathematics, bookkeeping and accounting, as well as business procedure. Typing instructions and such social studies as "Man and Industry," geography and history are available.

For those students who are either assigned to or who volunteer to participate in ITC programs, it is not, despite all the advantages, an easy thing. For those married students who have responsibilities at home it is no simple matter to sit down and begin to study in a foreign language after having already put in a hard day's work. Yet there is no doubt that it is worth it. Between 1952 and 1963 the number of unskilled Saudi workers decreased from 74 per cent to 21 per cent, while semi-skilled workers increased from 17 per cent to 22 per cent, and skilled workers from 9 per cent to an impressive 57 per cent.

With the constant goal of better training for better performance, Aramco has tried to broaden and strengthen its program through the years, to be sure that dynamic and ambitious young men like Muhammad and Hassan, who are willing to serve tea to learn English or travel by donkey, foot, and sail to get to class, get the chance they need.

William Tracy, a teacher, writer and an experienced photographer with one book on the Middle East already published, lives in Beirut. He contributes frequently to Aramco World.

Ancient mud brick construction may have been impressive but communities like Khraibah are quite unlike the fabled splendor of Arabia Felix.

BY G. LANKESTER HARDING

INSIDE ARABIA FELIX

Archeologists—we must admit it—do spoil things. No sooner does a nice romantic legend get hold of the public's fancy than the archeologists begin to poke about with their shovels and sooner or later come up with a fragment of something or other that ruins the legend for all time. And there's no better example of that tendency than the effects of exploration upon that most durable and romantic of legends: the ancient and fabled kingdoms in the mysterious regions called, however loosely, *Arabia Felix*.

Arabia Felix—Fortunate Arabia—was the name chosen by the Romans for the lands on the southern fringe of the Arabian Peninsula, some of which were known until recently as the Aden Protectorates, now the Federation of South Arabia, and Yemen. It would seem today, perhaps, in looking upon a region that is little more than empty plateau and arid desert, that the Romans exercised somewhat less than acute judgment in choosing such a name. But that's today. At the time there were many reasons for the Romans to believe that South Arabia was a blessed land. For one thing, neither they nor anyone else knew enough about that mysterious and unexplored land to refute or dispute the legends about *Arabia Felix*.

Those legends, going back many years prior to the rise of Roman power, held that it was out of the South

The ruins of the south gate in ancient Mayfaat in the Wadi Mayfaa.

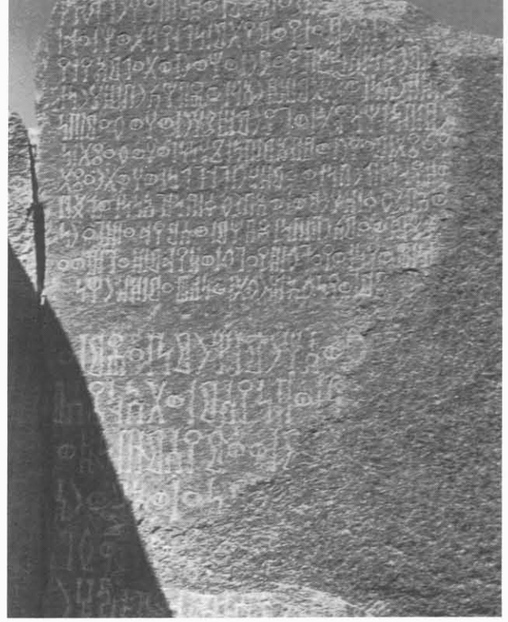
In South Arabia, archeology has cast new light on ancient legends...

Arabian kingdoms that the Queen of Sheba emerged in all her glory to confront King Solomon in all of his. They held, too, and the Greek geographer Strabo set it down in writing, that the inhabitants of Sheba had amassed vast treasures—stores of alabaster, spices, perfumes, ivory, tortoise shell, precious woods, pearls and silks—which they occasionally brought forth in great quantities to exchange for gold and silver. Another Greek, Agatharcides, added to the story with an arresting description of the South Arabian coastline:

"A heavenly and indescribable fragrance seems to strike and stir the senses," he wrote breathlessly. "Even far out from land as you sail past you do not miss the fragrant odors blowing from the myrrh bushes." Lastly, to confound skeptics, if there had been any skeptics, there was the indisputable fact that the South Arabians did have access to rich sources of incense, myrrh and spices, and that they had developed a very real and very profitable trade in those goods.

It is a curious thing, of course, that archeologists would wait so long before exploring a region that seemed to have played such an important role in ancient history and which spawned such wondrous tales. Yet it was precisely the conditions that kept the Romans and others from delving too deeply into the legend that held modern scientists at bay too: a harsh climate and difficult terrain. These conditions included, as one writer put it, "steep barren mountains ... deserts with no recorded rainfall, jungles and fever-infested desertic plains ..." Other men added such unpleasant intelligence as the abundance of scorpions and centipedes, the scorching temperatures and the stifling humidity. Even today travel is difficult. Great distances of desert, mountain or high plateau must be traversed merely to get from A to B and there's nothing to see on the way. Thus it was not until 25 years ago that the archeologists moved into South Arabia and began to probe the sources of the great legends and discovered that romantic and exciting as they may be, they are almost entirely without foundation.

The ancient kingdoms of South Arabia were known as Ma'in and Saba (Sheba)—in what is now Yemen—and Qataban, Hadhramaut, Himyar and Ausan. But instead of being kingdoms of great wealth they were kingdoms of traders—middlemen who sent their seamen and navigators off across the Indian Ocean to what are now India and Indonesia for shipments of spices which were then sent by caravan up the Red Sea coast to Petra for distribution throughout the civilizations of the east and the west. The traders held a tight monopoly on the routes by which their seamen, skillfully riding the treacherous monsoons which swept across the Indian Ocean, sought and found their products. It was a brisk trade which provided South



A specimen of the many alphabetic inscriptions left by the South Arabians.

Arabia with a prosperity that, if immeasurably more modest than legend claimed, was, nonetheless, substantial. But it was incense and myrrh that comprised the real basis of the kingdoms' income.

For modern man it is perhaps difficult to grasp the importance of incense in the ancient world. It is, after all, merely a gum resin, derived from a tree, which gives off a fragrant smoke when burned. Yet in the ancient world it was a vital substance, one that was essential to those involved and mysterious ceremonies by which priests and priestesses at innumerable altars in innumerable temples placated and petitioned innumerable gods. Myrrh played an essential role in embalming and was also added to lime to impart a high gloss to walls. The kingdoms of South Arabia were the principal producers and importers of both substances and so tightly controlled the routes their caravans used in bringing their valuable products to what is today called Jordan, that they managed to keep this monopoly. Eventually, however, the Romans began to send ships down the Red Sea to compete more cheaply and swiftly with the caravans, with the result that the South Arabian kingdoms were seriously hurt. In the 4th century, as Christianity reached further into pagan lands, supplanting many pagan rites, the demand began to lessen. Then, in the 7th century, there came Islam, which not only had no need for incense, but firmly opposed its use. For *Arabia Felix* it was the last blow. Its scattered kingdoms sank swiftly into oblivion.

In establishing the outlines of those occurrences, archeologists have had a most difficult time. Even without the definite contrast between the legendary splendor and the dismal reality, the few remnants of the real kingdoms that have been found and examined are distinctly disappointing. Except for capital cities such as Timna in Baihan, capital of ancient Qataban, and Shawah, capital of ancient Hadhramaut, the sites are small even by ancient standards and suggest a level of competence in architecture, sculpture and craftsmanship barely comparable to that of the Egyptians and Sumerians. At the same time it must be said that there have been some very interesting discoveries made—such as some rather remarkable achievements in building with mud brick.

Mud brick is hardly a material to inspire glorious architecture, yet in the area formerly known as the Eastern Protectorate, where great valleys slash through vast areas of high, blank tableland, it was—and still is—not only the chief building material, but was developed to a surprising degree of perfection. The buildings include great houses, four, five and even eight stories high, and one sultan's palace with an estimated 1,000 rooms. Although in fact the ground plans of some of those structures were developed from nothing more than a ground plan laid out with lime, the architectural details were carefully and beautifully done. White, lime-plastered exteriors of most buildings gleam brilliantly in the sun and the hard, highly burnished floors and walls reflected a technique otherwise unknown except in Neolithic houses of about 5000 B.C. in such areas as Phoenicia and Turkey.

Another interesting aspect of South Arabia's archeological findings is the existence of completely isolated square buildings, with front entrances on the first floor above rather than on the ground floor, with ladders to provide access and entrance, obviously a security measure. A third find is the great irrigation works in Baihan and the Eastern Protectorate, many in disuse for 2,000 years. Employing obstructions to divert waters from the river beds, the systems channeled the water into otherwise arid areas by means of an elaborate system of main and subsidiary canals, spillways and sluices, constructed on mud banks raised above the level of fields. Amid the vast areas of once-fertile, now-arid fields, the stone irrigation systems still stand in, perhaps, silent reproof.

Other discoveries in South Arabia include a series of imposing gateways, like those of Shabwa, Timna (modern Hajar Kohlan) and Mayfaat (modern Naqb al-Hajar), which, curiously enough, do not seem to have had gates or any other means of closing. There are no signs of the usual holes at threshold level in which the gate post revolved, and at Mayfaat, where the gateway is still intact to a considerable height, there is no indication that hinges might have been inserted anywhere. The mystery is compounded by the impregnability of the walls, which could have withstood fierce onslaughts, though to what avail is difficult to comprehend unless the gates could be closed.

On the cultural side, South Arabian sculpture has a certain local individuality. Usually the human body is treated as merely a pedestal on which to place portrait heads, many of which are excellent both technically and artistically, although the tops of the heads are left unfinished—as though a wig, cap or other headdress were to be added later. The South Arabians could also cast in bronze fine life-size statues and large, decorative plaques, lamps and caskets, as well as small, delicate figurines with inlaid eyes. Some work was done in local alabaster and gold jewelry from royal tombs of Ausan suggests that they were at least accomplished craftsmen if not imaginative designers.

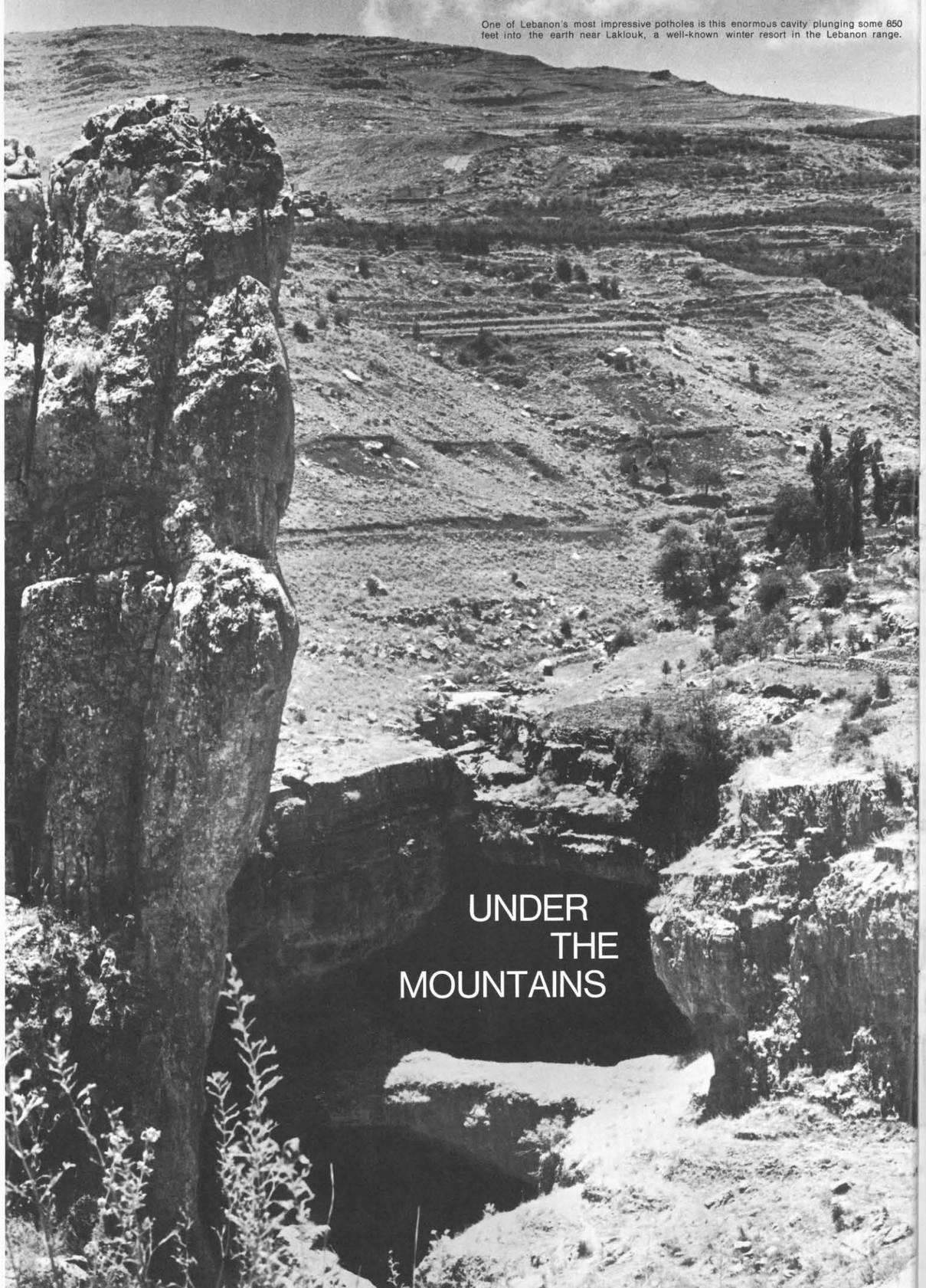
In unraveling the story of *Arabia Felix*, archeologists leaned heavily on a source of information not always available: writing. The South Arabians may not have been masters of a golden empire, nor creators of great temples, but they were prolific writers. In all the regions they inhabited, they left tens of thousands of alphabetic inscriptions, some merely names, others important historical documents. Unfortunately the inscriptions being so available diverted attention from the basic ABC of archeology: pottery. The result has been that attempts to assign even approximate dates to finds in the area have failed. There are, in fact, only two reference points for dating in South Arabia; one is the 1951 excavation by Wendell Phillips of the stratified site in Wadi Baihan going back as far as the 8th or 9th century B.C. and the other is Miss Caton-Thompson's excavation at Huraidha in Hadhramaut, which relates to the period from the 6th to the 4th centuries B.C. The findings of the Phillips expedition, unfortunately, have never been published and for practical purposes are useless. For sites in Hadhramaut the Caton-Thompson work is immensely useful and enables investigators to assign approximate dates to other sites of similar nature where sherds of the same type are found. It is, however, very limited in application, because when sherds are found which cannot be compared to those of Huraidha it is only possible to guess, on the basis of comparison, whether they pre- or post-date that material.

Even the inscriptions themselves present a problem. Although there is scarcely any site without at least remnants of carved inscriptions, and although some of the big sites have complete or fragmentary texts by the hundreds, the value is limited because of the lack of dating. At Timna, for example, almost every stone of the great South Gate is inscribed and the texts are long and historically valuable. Furthermore, many thousands of inscriptions from all over South Arabia have been collected and published and many of them mention kings of Saba, Qataban, Hadhramaut and other kingdoms. But no dates can be assigned with absolute certainty, and identification of the names mentioned depends on the works of the few Greek and Roman writers who took an interest in this part of the world and who mentioned the same rulers. Even the South Arabian alphabet which required many centuries to develop and which, between the pre-Christian era and the 6th century A.D., went through a series of very marked changes, gives no clue to dates because there is no reference point. In short, archeologists have a remarkable wealth of subject matter but, ironically, have not a single reliable chronological bench mark from which dating can begin.

In many ways, then, South Arabia is still a land of mystery. If archeologists have spoiled the romantic legends of Sheban riches, they still have only touched the surface of what remains to be discovered and it is still possible that future discoveries may rival, or even overshadow, the legends that gave the region its historic if inaccurate name.

G. Lankester Harding, C.B.E., F.S.A., was Director of Antiquities in Jordan from 1936 to 1956, during which time he wrote The Antiquities of Jordan *and participated in the recovery of some of the Dead Sea Scrolls. He lives in the village of Dar'oun in Lebanon.*

Even today, archeologists have barely begun their study of this land of ancient legends.



One of Lebanon's most impressive potholes is this enormous cavity plunging some 850 feet into the earth near Laklouk, a well-known winter resort in the Lebanon range.

UNDER THE MOUNTAINS

BY JAN VAN OS

For this down-to-earth sport it takes down-into-earth people—and that's just what "spelunkers" are...

There are two sorts of mountain climbers: those who go up first, then descend, and those who do it exactly the other way around.

Those in the first category, which is by far the largest, have certain advantages. They can see their target, be it a wind-swept ridge or a snowy summit. They can estimate how long it will take to get to it and, having achieved it, can look down upon a beautiful world.

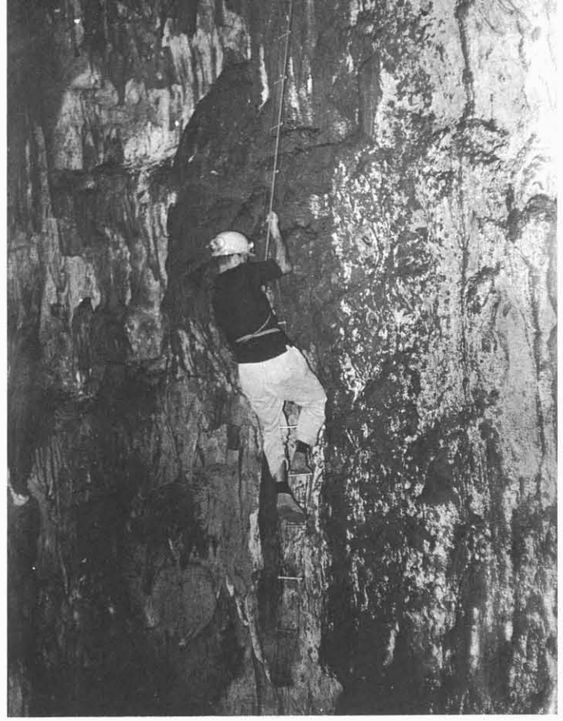
For those in the second category it is rather different. They cannot see their target and indeed may not even know where it is, what it is, or even if they have arrived at it. Frequently they have little idea where they are and know only vaguely how far they have gone. And when they've arrived they look, not down, but *up* at *their* beautiful world: a black void deep beneath the earth's surface. For these men are speleologists —"spelunkers"— the tough and daring sportsmen who dedicate themselves to the exploration of inner space, the myriad and mysterious caves, caverns, pits and passages that honeycomb the depths of the earth.

"Spelunking" is restricted to no particular country or region, unless of course there are no caves, but in Lebanon it has been raised to a very special art. Here so many beautiful, interesting and challenging caves and holes have been carved into the earth, that those Lebanese who for one reason or another have come to like speleology, have had unexcelled opportunities to perfect their skill. If you were, however, to ask a Lebanese spelunker why he is devoted to such a hazardous sport, you would get no answer, not even the famous "because-it's-there" reply of the mountaineers. Not that he is anti-social; it's just that he hasn't time. For Lebanon's spelunkers are part-time, weekend devotees who feel that they have too far to go and too much to do to waste time speculating on why they do go down. Suffice it to say, they seem to suggest, that what to some people is a frightening dark hole burrowing deep under the mountains, is to them a challenge and an invitation to investigate the unknown.

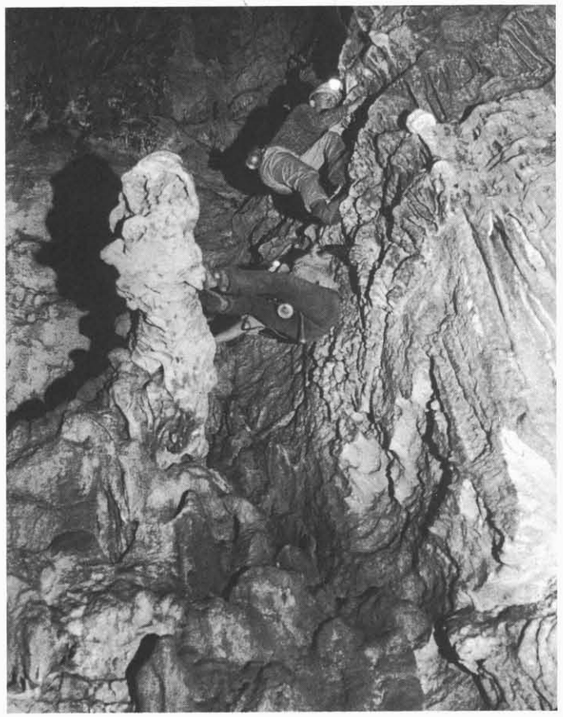
The first step in spelunking is, naturally, finding a cave or a pothole—a deep, natural, cylindrical pit scoured out of soft rock and going deep into the earth. This is not always easy, but, according to Albert Anavy, a founder of the *Spéléo-Club du Liban*, spelunkers soon develop an instinct for finding "good potholing country." They also seek advice from peasants or shepherds who, as a rule, are quite willing to show the strangers from the city the deep holes which, for all they know, conceal unknown evils.

Having reached such a place, the explorers start to unpack their equipment. Most important are the light, strong ladders, up to eight inches wide and made of twisted steel wire with aluminum steps. They come in lengths of 30 feet each and can be linked so as to make possible uninterrupted descents of many hundreds of feet. Next are the nylon ropes that will be tied to the men going down or returning to the surface, and the aluminum or fiberglas helmets, each mounted with a hissing carbide lamp, remniscent of the old days in coal mining. Then there are, depending on the importance and the duration of the search, rubber dinghies, field telephones, electric or carbide lamps, and sometimes walkie-talkie sets, cameras, medical equipment, food, sleeping bags, extra supplies of dry clothing, all characterized by the qualities essential to underground exploration: strength, durability and lightness.

Getting underway, the surface crew first anchors a set of strong steel wires to a rock and then hooks the ladders to the wire. The spelunkers usually have some idea how many lengths of ladder they have to assemble because



To descend into a pothole, a spelunker clambers down a light but strong wire ladder which hangs free from the lip; he also attaches a nylon safety line to his waist.



In exploring inner space speleologists must be prepared to surmount many obstacles that challenge their strength and daring such as this steep underground cliff.

they can estimate roughly how deep the first stage of the descent will be simply by throwing pieces of rock into the hole and counting the seconds it takes to strike bottom.

The first man to go down is sometimes the most curious of the team, but usually is the most experienced. From the top rung of the ladder he disappears, quietly and calmly, over the lip of the hole to begin what is, in exploring a pothole, a difficult and demanding descent. Ladders going into potholes usually hang free, thus requiring the spelunker to lock both arms and legs around the ladder, an awkward, sometimes painful way of climbing. Skilled speleologists let the legs do 90 per cent of the hard work and use their hands, held about shoulder height, for extra support and for keeping their balance. They must, at the same time, take care not to scorch their hands or burn the safety rope with the unshielded flame burning in the helmet lamp.

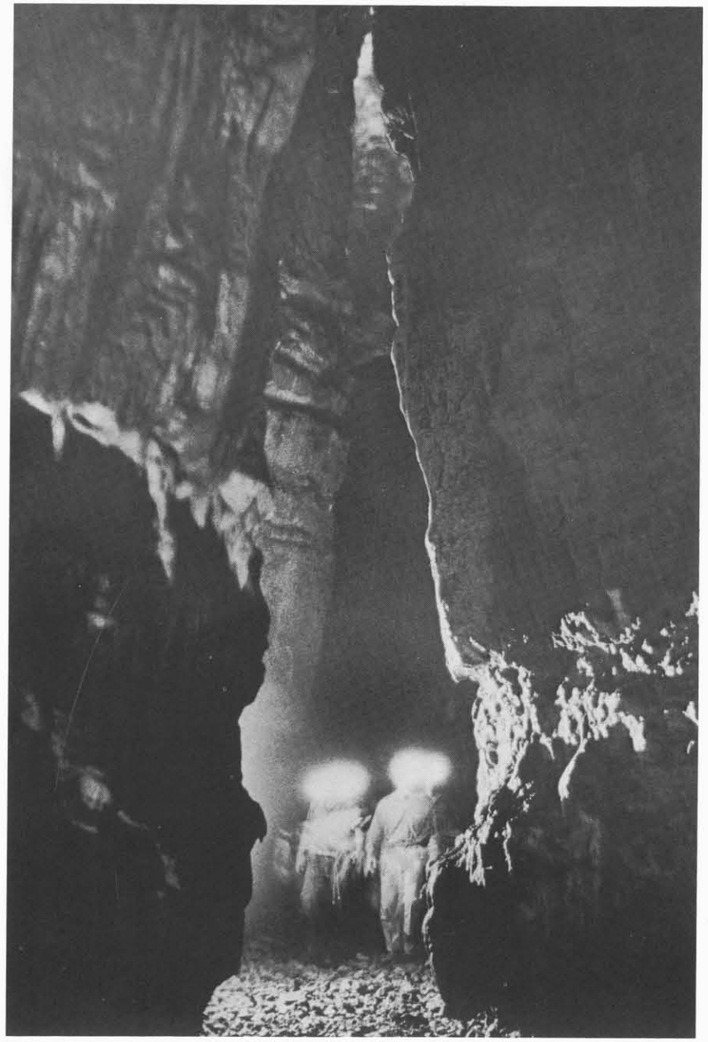
From time to time the climber shouts directions or questions to those above, who quickly lose sight of a climber even in a short descent. They continue, however, through the tension on the safety rope, to "feel" that presence, and calculate how far down he is. The climber may report findings or ask for extra equipment—such as more ladders. Sometimes whistle signals are used, but "keeping it short" is the golden rule for all concerned. Confusion must be avoided, and breath must not be wasted.

During his descent the climber may free his hands to make notes, or to take a picture, or may rest by attaching a steel belt hook to the ladder or by sitting on a small platform or ledge, if he can find one, along the pothole wall.

When he reaches a point where he can proceed by walking or climbing without needing the ladder, he loosens his safety line, yells "cord free," upon which the surface crew hauls it up. Then a second man descends and a third and so on, leaving, however, at least a few men on the surface to supply more equipment and, as a safety precaution, to insure that a whole party could not simply disappear unnoticed. To go alone is, in speleological circles, foolhardy and dangerous.

What these men may find deep under the ground, in those initial stages, is anybody's guess. It may be wet down there, or dry. It may be very cold, or just a few degrees cooler than "upstairs." The explorers may stumble, glide or jump into vast spaces, as high as a cathedral, some of unmatched splendor and with colors beyond description. The mysterious hole may lead into narrow corridors, steep descents, treacherous little lakes and wild rivulets, to just end suddenly in a blind alley. They may come across a vast network of corridors and passages, like the inside of a gigantic ant-hill, but one where no sound but that of dripping water is heard and where nothing moves but the shadows cast by the flickering lamps. And sometimes, on rare and exciting occasions, they may edge carefully through a tiny passage into a chamber of what, to those who never venture beneath the surface, have become the mark of great caves: stalactites pointing down from the dark tops of the caves and stalagmites pointing upward. These phenomena, which mark many of the famous caves of the world—Carlsbad Caverns and Mammoth Cave, for instance—take fantastic shapes and are of incredible coloring. They are formed as a result of ground water oozing slowly downward and dripping steadily into the cave, century after century. This water contains certain chemicals which, when the liquid is exposed to the air in the cave, materializes and hardens. Sometimes the stalactites "growing" from above and the stalagmites "growing" from below meet and create columns and pillars of an almost unbelievable magnificence.

Whatever they find, spelunkers are certain to do one thing: record it. They know, and are quietly proud of the fact, that even if speleology is generally considered as either adventure or sport, the findings of spelunkers are watched carefully by many specialists. Archeologists, for example, are alert to the possibilities of new cave paintings or other evidence of ancient life. Hydrologists are eager to trace the movement of underground supplies of water or find new sources which might be tapped to meet the needs of agriculture. Geologists and biologists follow the findings of spelunkers too. Because of this, spelunkers are careful to keep detailed notes, to draw maps, to take still pictures and movie films and to publish all their findings in either their own local club bulletins (like SCL's, appropriately titled "The Bat"), or sometimes in national and international publications.



The world of the speleologist is a dark and unknown place where light and sound are rare phenomena.

For Lebanon the activities of the *Spéléo-Club du Liban* have already produced a tangible economic find that clearly demonstrates the contributions that can be made by the spelunkers: Jeita, one of the cave wonders of the world and one of Lebanon's outstanding tourist attractions. Although the cave had been discovered long before, it was not until 1946 that Mr. Anavy and Lionel Gorra, the co-founder of the SCL, explored it in its entirety and discovered that it was a five and a half-mile cavern of unimaginable beauty and that in it was an underground stream, as wide as a lake. After they published their findings, they were able to convince the government that the cave of Jeita, if properly lighted and if equipped with flat-bottomed boats which could navigate the underground river, would undoubtedly become a number one tourist attraction. Thanks to their perseverance, it did. By last fall the season's total of visitors was counted in the tens of thousands.

Jeita is not the only accomplishment of the SCL. Its approximately 50 members, mostly but not exclusively men, fanning out through the mountains each weekend, have, in the last 13 years, found and either partially or completely explored 300 caves or potholes including the seventh deepest pothole in the world—a pit 1,870 feet deep at Faouar Dara not far from the village of Majdal Tarchich, east of Beirut. Faouar Dara was conquered by a handful of Lebanese spelunkers headed by Sami Karkabi in 1962. They submerged at noon on Friday, September 14, 1962 and did not return to the surface until 7 a.m. Monday, September 17 after climbing, crawling and inching their way through nearly two miles of almost total darkness.

It is not, however, to establish records that the speleologists go down into the earth. It is simply to meet a challenge and to demonstrate that if there is nothing new under the sun, there is still plenty where the sun never penetrates—down in the realm of the spelunkers.

Jan van Os, a Dutch journalist who has worked in Amsterdam and London, was a public relations writer for the Aramco Overseas Company in The Hague for nine years and is now a member of the Aramco World *editorial staff in Beirut.*

Squirming forward, sliding down or crawling up, spelunkers keep moving, never knowing what subterranean wonders wait at the end of a narrow passageway.

In the glow of a flashlight, speleologists examine a specimen of rock which might be of value to the many men of science who watch the spelunkers' findings with interest.