Aramco World

505 PARK AVENUE, NEW YORK 22, N. Y.

As night begins to shroud the Congo, a boatman pushes across the river at a point where its waters are broad and calm.

SAGA OF A GREAT RIVER

banks, and in the trees above them gray monkeys stare and scold.

There is no twilight along the banks of the Congo. There is sunset — then black night. The little villages along the river go to sleep, but in the jungle just beyond their clearings there is constant activity. It is unseen and unheard — leopards and pythons are silent hunters — but it goes on without cessation, the living and the dying, on the moist, poisonous floor of the jungle and in the precarious treetops.

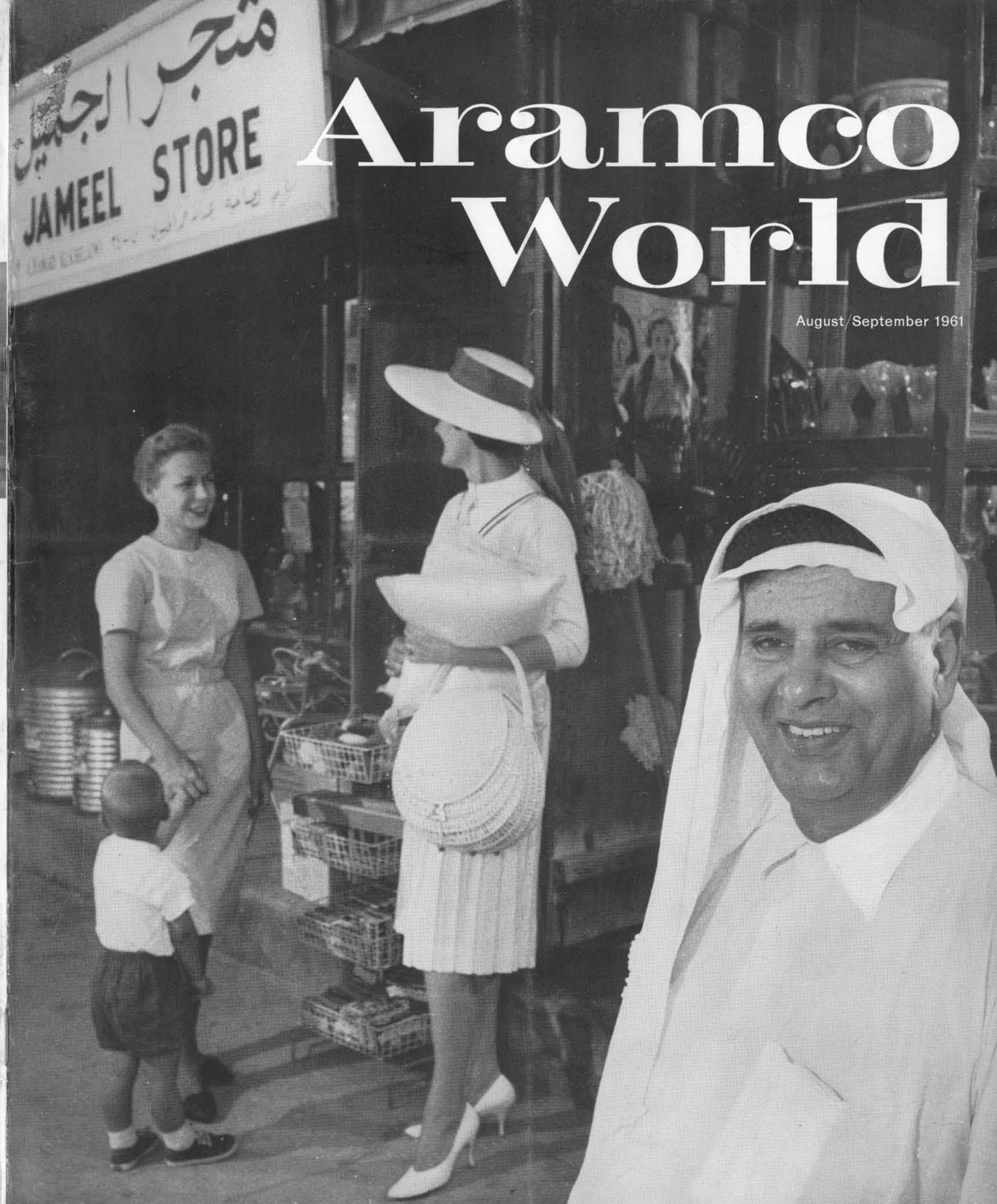
In its long winding through the equatorial forest, the Congo also flows through the lives of the people who inhabit the little villages. From the river they draw much of their food. At Stanley Falls the Wagenia men still fish with their elaborate, scaffold-suspended wicker nets, as their tribe has done from time immemorial. Nearby, the Wagenia women do their laundry in the river, while their children splash and paddle happily. The ancient ways and the modern ones meet on the Congo. In a city like Leopoldville, Congolese natives work in modern stores, offices and factories, but most of the people along the river still live as their tribes have lived for centuries. Their homes are huts, their weapons are spears and bows and arrows and their clothes are often grass skirts or loincloths. The faces and bodies of some Congolese are elaborately "cicatrized" — scarred for decorative purposes. The Bangalas, who live along the Upper Congo, acquired a reputation for great expertness and high fashion in this painful form of beauty culture. Here and there, a Congolese shows, when he smiles, a set of teeth filed down to sharp points. This is the mark of the cannibal. He may not be one — but you cannot be sure. Less sinister, but just as bizarre, is a deformation traditional among the Mangbettu people —elongating the skull by tightly binding infants' heads. This peculiar practice is said to be dying out.

To a student of human types the peoples of Congo are, in their variety, compellingly fascinating. In no other country is it possible to find, almost as neighbors, a tribe of giants and a tribe of small men. But in the Congo, west of the river, the Watusi, men seven feet tall, are not uncommon; and in the Ituri forest to the north live the Lilliputians of Africa, the Pygmies, whose four-foot height seems even less against the immensely tall trees among which they dwell.

Like any of the great forces of nature, the Congo goes mindlessly about its business, unconcerned with the political turbulence that has made this part of Africa a center of world attention. Four years ago the river's great western bulge, Stanley Pool, was French on one side and Belgian on the other. Today the influences of these two countries remain, but the two cities at the Pool — Brazzaville and Leopoldville — are the capitals of two new nations, both Congo Republics and both depending in many ways on the great river they share.

As the country changes, much of the Congo jungle will disappear to make room for cities and farms. The Congo river itself will lose much of its beauty and its mystery as its waters are put to work to provide electric power for Central and West Africa. The great Congo basin has a hydroelectric power reserve of 130 million horsepower — one fifth of the available water power of the entire world.

It will be decades before this is accomplished. In the meantime the Congo river will continue to flow through a country that still remains largely what it was centuries ago. It will go on pouring its immense flood of water into the Atlantic, coloring that ocean for a hundred miles out. Diego Cam, the admiral who went exploring for Portugal's King John II, was the first European thought to bring a vessel into this muddy current. In 1482 he followed it into the huge mouth of a river — a river that the natives called "the great water." He had found the Congo, a great water indeed. Some rivers are longer, none is greater. ■



BROWSE-AROUND STORE IN AL-KHOBAR

Aramco World

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FRONT COVER: Abdullah Alhamad al-Khiliwi, best known by shoppers as "Jameel," greets Mrs. Sally Leggett (left) and son Kenneth and Mrs. Militza Christophersen. Mrs. Leggett and Mrs. Christophersen are wives of Aramco employees.

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"Country Store" in Saudi Arabia

American and Saudi Arab shoppers in al-Khobar hightail it to Jameel's, where the warmth of welcome and comfortable clutter of wares are reminders of the old-time general store

After a leisurely look through the shelves, an American housewife chats with proprietor Jameel while he cuts length of ribbon.

ABDULLAH Alhamad al-Khiliwi is a successful merchant in the city of al-Khobar in eastern Saudi Arabia. Mr. al-Khiliwi is known to nearly all his customers simply as "Jameel," a name taken from the sign above his shop, "JAMEEL STORE." At midday, when he draws the plank shutters across his show-windows and front door, there is a subtle change in the pulse of this bustling, sun-drenched Muslim city. The twentieth-century tempo slows under the honored round of custom and faith.

Along streets where only a few years ago sinewy, powerful white donkeys drawing an unending variety of two-wheeled carts had an almost uncontested right of way, Fiats and Oldsmobiles, Mercedes and Chevrolets, pick-up trucks, contractors' huge diesel-powered trucks with plumes of blue smoke flowering above their high vertical exhausts, and fragile-looking bicycles now thread their way.

Along the sun-baked, asphalted streets other merchants are also closing doors, cottering shutters or lowering the wide, steel curtains that form the characteristic store-front of al-Khobar. Handsome, four-storied apartment buildings with street-level shops raise their balconied façades in the brilliant, transparent whiteness of the desert sun.

About a mile away from Jameel's at the end of the al-Khobar pier, six barefoot men clad in traditional *thobes* (ankle-length skirts) and *ghutras* (cloth headdresses) chant in rhythm and raise a heavy flat of Japanese plywood

A "new" main street in al-Khobar is a myriad of modern shops and apartment buildings, a beehive of activity until noon.

"COUNTRY STORE" IN SAUDI ARABIA

sheets from the hold of a coastal *dhow* onto the dock. "Ya Allah . . . ya Allah . . . ya Allah . . ." their prayer-chant gathers intensity, then falls to silence as the flat careens forward. Burlap-wrapped boxes of tea from Ceylon wait to be unloaded next. Jameel's merchandise comes across this dock from the ports of the world. A few blocks away in the older business quarter of the city, along the "old road," the money exchanges are shuttered.

On the new "main street" – Prince Khalid Street – the "exhibitions" (department stores) have emptied, the entrance to the bank is locked, the travel agencies have closed and the Hillman, Opel and General Motors showrooms are idle. Jameel locks the heavy wooden shutter across the door of his store. Over the *thrum* of traffic and the cry of a live chicken being stuffed into a grocery box by a young boy, Jameel can hear the *muezzin's* call to noon-day prayer from the large mosque – a call that rises through an amplifier. The stores of the city will not open again until four o'clock; they will then remain open until eight. Jameel steps from his store and walks along Second Street from which sounds are already disappearing.

Jameel is 46 years old. He is of medium height. His face is rounded and his upper eyelids tend to drop down across his dark eyes. There is a mingling of repose and courtesy in his face. When he laughs, his eyes open wide and he raises his head and tilts it slightly to the right. He moves his hands lightly on the air in gestures that have no abruptness, no sharp accents.

Every morning at eight o'clock, when Jameel opens his old-fashioned store, he steps into an arena of risk. For example, two bundles of red and yellow hula-hoops hang from the ceiling. Several years ago American families in Dhahran, Ras Tanura and Abqaiq wanted – *demanded* – hula-hoops. Parents entered their names on Jameel's reservation list. The list grew; Jameel increased his shipping order. He pleaded with his supplier in Holland – *please hurry*. The hoops arrived, alas, as the fad departed. Jameel was stuck with a big supply of the plastic circlets. "It cost me about four thousand *riyals*," he says. The hoops remind him almost every day of the will-o'-the-wisp nature of American fads.

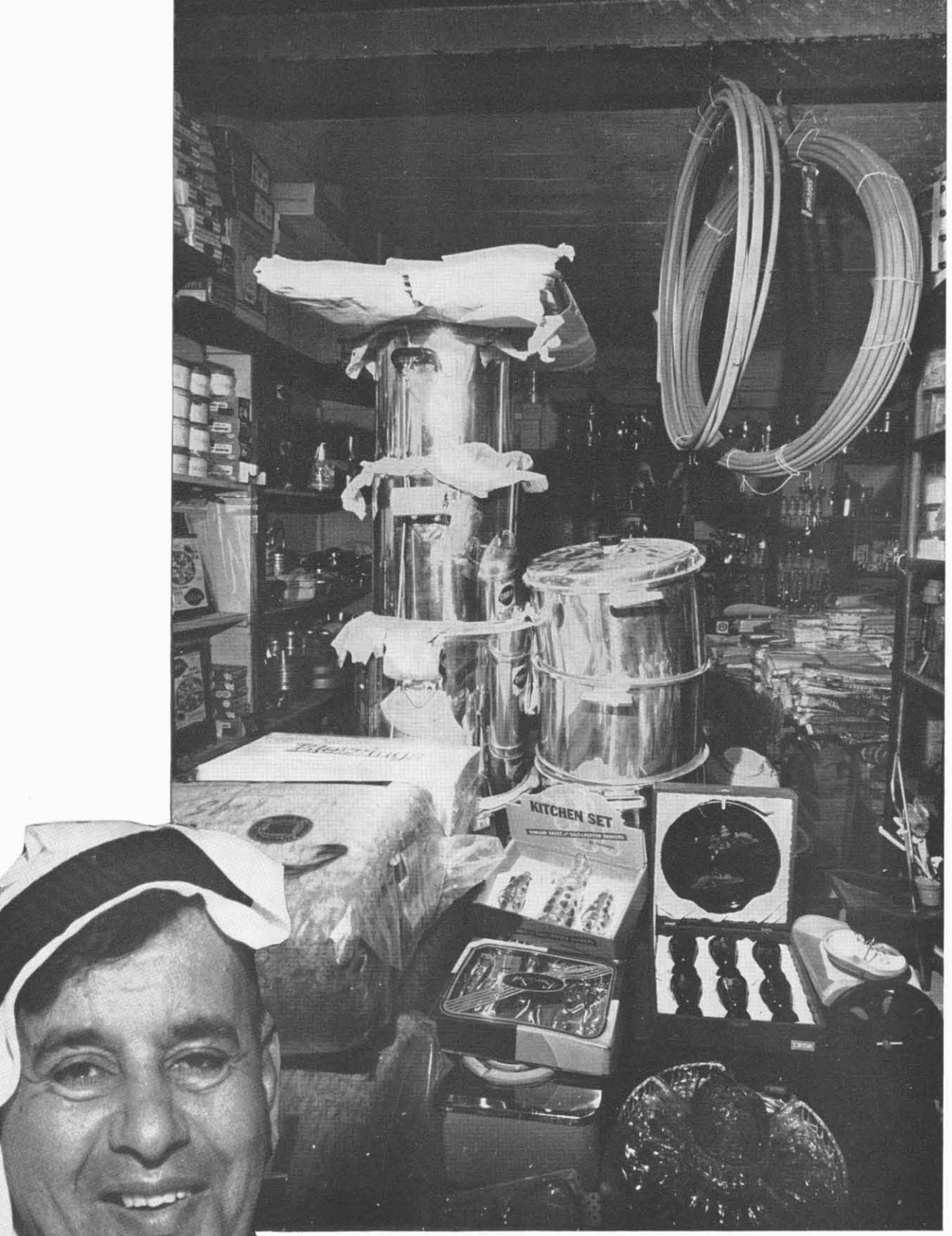
In the swift progress of al-Khobar, Jameel represents a deviant moment. His is a distinctively "old shoe" establishment, a comfortable throw-back (from an American point of view) which his customers not only appreciate but applaud. They talk about Jameel's store with an odd affection. They brag about its marvelous disorder. An American merchant might be shocked by the tumble-down disarray of Jameel's shelves. And he might well shudder at the implication of the Americans' delight in this state of affairs. Jameel does not find it necessary to *advertise* that he is friendly; he *is* friendly.

A young American mother, kids in tow, remarks: "This is our dime store." A man puffing on his pipe remembers something else. "Jameel's reminds me of the old general store. I grew up in New England, and I can still recall the old country crossroads store. I always get a big kick out of Jameel's."

"Jameel – the man and the store have become one. The word means "beautiful" in Arabic; there are "Jameel" stores in Kuwait and Beirut; the name is a common male surname in the Middle East. These facts are all part of a strange phenomenon: Abdullah Alhamad al-Khiliwi has disappeared, perhaps permanently, into the happy oblivion of "Jameel's" success.

The "Jameel Store" is a relatively large room with a smaller room in the rear. It is, in the very best sense, a *general* store. Its astonishingly various stock cascades along glass-topped counters and rises to the ceiling where naked fluorescent lights hang and large-bladed fans rotate slowly. Although many of his competitors have installed modern open-shelf displays, Jameel persists in simply "putting out" the latest shipment wherever it will fit. Counters, shelves, old-fashioned display cases and shopwindows are a jumble of merchandise that would have been welcomed in America's crossroads past.

Jameel's "merchandising" may not follow the latest sales techniques, but no one seems quite willing to trade the charm of his methods for the methods of Madison Avenue. Somehow odd juxtaposition is a keynote at Jameel's. A handsome English perambulator built for twins (Does Jameel know the probability rate for the birth of twins? The odds against the sale of this pram?) is covered with a polyethylene cowl. Candlewicked counterpanes (also from



Jameel's cheerful countenance reflects the homey, relaxed atmosphere of his come-in-and-browse-around store. Not unlike an old-fashioned New England general store, it is chockablock with pillows, prams, pressure cookers, hula-hoops and odds and ends.

"COUNTRY STORE" IN SAUDI ARABIA

England) are piled high in the pram. A child's wagon from the United States is filled with scouring pads, brass hardware for kitchen cupboards and window curtains, and ant traps. An ironing board stands open and is put to use as a display counter for glasses, ash trays, candy dishes, nut trays and other coffee-table accessories.

The manufactories of the world meet along Jameel's spill-ways. On one counter a four-quart pressure cooker from Eau Claire, Wisconsin nudges an electric iron from the English midlands. Meat cleavers from Birmingham, England contend with shiny, wooden-handled garden tools from Japan. A wood-base nutcracker (semi-automatic) from St. Louis stands by a box of ice cream scoops that arrived from Hong Kong. A baby's scale from West Germany hovers over a "cured" cast-iron skillet from Sidney, Ohio. A set of children's glasses decorated with the legend "La Belle et Clochard" (*Lady and the Tramp*) and bearing Walt Disney's copyright sits a few feet from a puree masher-and-strainer with a pasted-on sales message: "Moulin-Legumes . . . veritable . . . pour chaque usage."

Jameel's is a combination treasure chest and scavenger

Jameel opened his present shop in 1953, but later this fall, with years of success behind him, Jameel will begin to serve customers in a brand new, air-conditioned building.

hunt. In its narrow aisles Americans squeeze by one another and stoop to search through the heaped array in the shadows of a bottom shelf. "Americans see the price," Jameel says, "and that is the price. They do not argue. But for some of my customers the price marked down is only the start. They say, 'Is *this* the price?' and we talk about it." But in the narrow aisles and crowded corners one hears American housewives confounding Jameel's generalization. "Let's wait until we get to Cairo," says one to another. "We may be able to do better." Haggling — the old tradition of the bazaar and the *suq* (Arabic for bazaar) — is highly formalized. The American woman is more direct. "Hey, Jameel, this mop is marked eight *riyals*. On 'main street' it's *seven*." Jameel looks at the mop she is holding. He lowers his eyes. "A mistake." His voice is low and even. "It should be seven. Yes?"

Jameel was born in 1915 in the Nejd uplands in central Saudi Arabia. His father was a merchant ("Not in a store—he was, rather, door-to-door. And he shipped out dates." This was in the years before the Saudi Arabian Government proscribed the export of dates.) Jameel's schooling as a boy included some years in Bombay where he learned a utilitarian English, now colored with Americanisms from his years with Aramco and his subsequent years as a quasi-Yankee storekeeper. In 1936, just two years after Aramco started its pioneer drilling camp in Saudi Arabia at Dhahran, Jameel joined the company. He worked in the commissary where he became familiar with the variety of pots and pans, skillets and roasters, and other cookingware that the American housewife requires.

In 1951, Jameel opened a small store in al-Khobar. He had able and willing assistance from his American friends in the Aramco commissary, particularly Fred Graaf, now in retirement. Graaf wrote to manufacturers to get catalogues for Jameel. He guided his initial inventory. Since that time, Jameel has built his inventory on customer requests, long searches through manufacturers' catalogues (always with an eye to price), by reading the advertising in American and English magazines and by visits to stores and manufacturers in Holland, Germany and England. He is presently planning to visit Hong Kong and Japan.

In 1953, Jameel opened a branch store in Dammam, a nearby Persian Gulf city. The store closed within the year. ("No demand.") But the same year he moved into the then newest building in al-Khobar, his present location. One of his most persistent problems is *quality* ("American women are very fussy"). For a while he acted as agent in eastern Saudi Arabia for an English manufacturer of kitchenware. The pots and pans quickly tarnished and pitted in the salt air and extreme humidity. There were many returns, and Jameel was stuck with the stock. He dropped the agency and took on the agency for an American exporter of plastic goods. The plastics sell well and stay sold.

Later this year Jameel will move into a new store now under construction on Prince Khalid Street. Once more he will have a store in the "newest" section of the business district. "It will be more comfortable for my customers," Jameel says. As he talks about the future, Jameel leans back from his cluttered counter (below the hands which rest on the glass counter-top one can see thread, needles, bobby-pins and ping-pong balls from Japan). His left shoulder touches the large show-window behind him which looks out onto the street. In silhouette against the late-morning sun one can see a row of dresses from Holland and England. There is a hooded sweat shirt among them.

The new store will be air-conditioned. And there will be a woman clerk added to Jameel's present sales staff of two. But will the store have the same casual flavor? The odds are that it will. "Oh, yes," Jameel says, "I will take the hula-hoops with me. Maybe some day . . . ." ■

The Wearing of the Kilt

ONE long-ago, summer day a tall Scotsman strode happily into a Highland town, his bright kilt flashing in the sun. Suddenly, to his consternation, he was surrounded by soldiers, arrested and marched off to jail.

"But why?" he angrily demanded. "What terrible thing have I done?"

An officer pointed accusingly to the colorful tartan kilt. "It's for the wearing of *that*," he said. "Don't you know kilts have been banned by law?"

The Scotsman listened in disbelief.

"Kilts — banned by law? It can't be true."

But it was. On this August day in 1747 the British Parliament, worried about a possible Scottish uprising (one had been put down only two years earlier) had sought to strike at the very backbone of rebellious Scottish Highland spirit. It had passed a "Dress Act," which took away from the men of many shires the right to wear kilts.

Parliament's fears proved futile; the uprising never materialized and the indignant Scot soon was released from jail. But the story makes a point worth remembering the next time a Highland band comes swinging down the street, kilts a-swirl and bagpipes whistling a merry tune. As the astute lawmakers knew, a kilt, to a Scotsman, is

There's an old, proud story behind those eight yards of jaunty, pleated plaid

Modern countrymen of this old-time Highland chief (left) wear the traditional kilt even in athletic contests, such as throwing the hammer.

THE WEARING OF THE KILT

far more than a mere article of clothing. It's a symbol. It represents his great spirit. And to him it also spells freedom and hope, courage and honor.

It may seem strange that a Scotsman attaches such symbolism to a mere article of clothing. Basically, authorities say, the kilt is a relative of the loincloth – the simple male attire worn in earliest civilizations. Several nations and races have worn kilts. The early Greeks wore – and some modern Greek regiments still wear – kilts of purest white. The Cretans wore kilts weighted with pearls to keep them from blowing in the breeze. And the Egyptians – lord and master alike – were wearing ornamented, apron-like kilts 2,500 years ago. Even the high priests of ancient Babylonia and Assyria sometimes wore a waist-to-knee kilt adorned with braids and tassels and flung around the lower trunk like an apron.

The French wore ornate kilts in the time of Charles II. Basque Spaniards, Norwegians and Irish pipers all have used them, too. But history shows it was the Scots – and especially the men of the rugged Highlands – who really glorified the kilt.

No one knows exactly where the Scottish kilt came from or exactly how old it is. Some Scotsmen think that kilts have been in their land since time began. Carved figures on a stone dug up from the ancient Roman Wall in Scotland support this view, for the figures all appear to be kilted. But other authorities believe today's colorful kilts are of more modern origin – that is, they appeared only about 230 years ago. According to one story, hotly discredited by some Scots, a merchant operating a mine in Scotland noticed in 1728 that his employees found it hard to work in the belted tartan plaids that Scotsmen wore in those days. These were great woolen wraps, useful as cloaks by day and blankets by night and made of as many as eight yards of cloth that hung from shoulder to knees. He suggested that these plaids be cut in half – one part to be worn around the shoulders (as a Scotsman wears his plaid today), and the other part to be wrapped around the trunk in a separate, skirt-like garment. As the story goes, the employees tried his idea, found they could discard the shoulder wrap at times and work better in the short "kilt." The idea spread and became popular. This legend of the kilt's origin is disbelieved by many Scots, and historians still argue over whether it is true or false. Whatever its source, the kilt today is mainly a regimental military uniform. Scots have found it so comfortable, as well as practical, that they have resisted efforts to change it to trousers.

"There is something special about a kilt when you're marching," says one Scottish soldier. "Trousers are hot, miserably uncomfortable and confining. But the kilt is cool, and the breeze on your bare knees makes walking – or marching – a springy, easy, pleasant experience. You discover a feeling of freedom that no man ever knows in trousers, and you move along faster – and with more spirit. That's why kilted troops don't like to follow trousered men when marching. *The men in trousers are just too slow!*"

In wet weather, when trousers get clammy and heavy with mud, the Scot claims that his bare legs and feet dry quickly. Without clinging mud to dampen his spirits, his morale remains high. Other troops may wade through deep water and then have to live in wet uniforms for many hours or even days. The Scot wades through without problems; if the water is more than knee deep he merely removes his kilt and then wades on, carrying the dry kilt over his shoulder.

All this great freedom seems to increase his fighting spirit. The kilted Scot has become so renowned in battle that in World War I the mere sight of any army of Highlanders charging on the run, tartan plaids swinging, tough, bare knees showing, spread terror among enemy troops, and the kilted fighters won the name "Ladies of Hell."

Kilts have only one fault in battle: they tend to catch on barbed wire. Otherwise, they have been found intensely practical. Cold weather is ordinarily no handicap since a good kilt is made of warm woolen plaid.

Long before the present tartan plaid patterns appeared in cloth, each Scot wore a curious badge – a twig of some common tree or plant. Some wore holly or broom; others wore yew. These "badges" identified them by clan. If, for example, a traveler met a man wearing a sprig of boxwood, he would know him at once for a MacPherson.

Today Scots still wear this "badge" – not in plants but in the distinctive plaid pattern from which each clan's kilts are fashioned. One of the best known is the Royal Stewart tartan (red with blue, black, yellow and green for "dress"; or green and black with yellow, red and blue stripes for "hunting" – which now means daily wear.) Others well known are the famous Black Watch (sombre dark blue, green, black), and the brighter Cameron (black, blue, green and red with a yellow line).

Although kilts (the word means "tucked") are mainly a military uniform, they are also worn today by a good many civilians and schoolboys in Scotland. And Scots throughout the world wear them whenever they meet for clan festivities.

A kilt is not at all like a skirt: it's not lowered over the head or stepped into and drawn up to the waist. Rather, it's more like a blanket or robe, with six to eight yards of cloth, which is wrapped around the wearer from left to right. Starting at the left hip, the cloth is passed in front of the wearer, around his right hip, then behind him and back to his left hip. Then the cloth is buckled once, and the wrapping continues. The cloth passes in front a second time and continues as far as the right hip. Here it is buckled again and also fastened with a large "kilt pin."

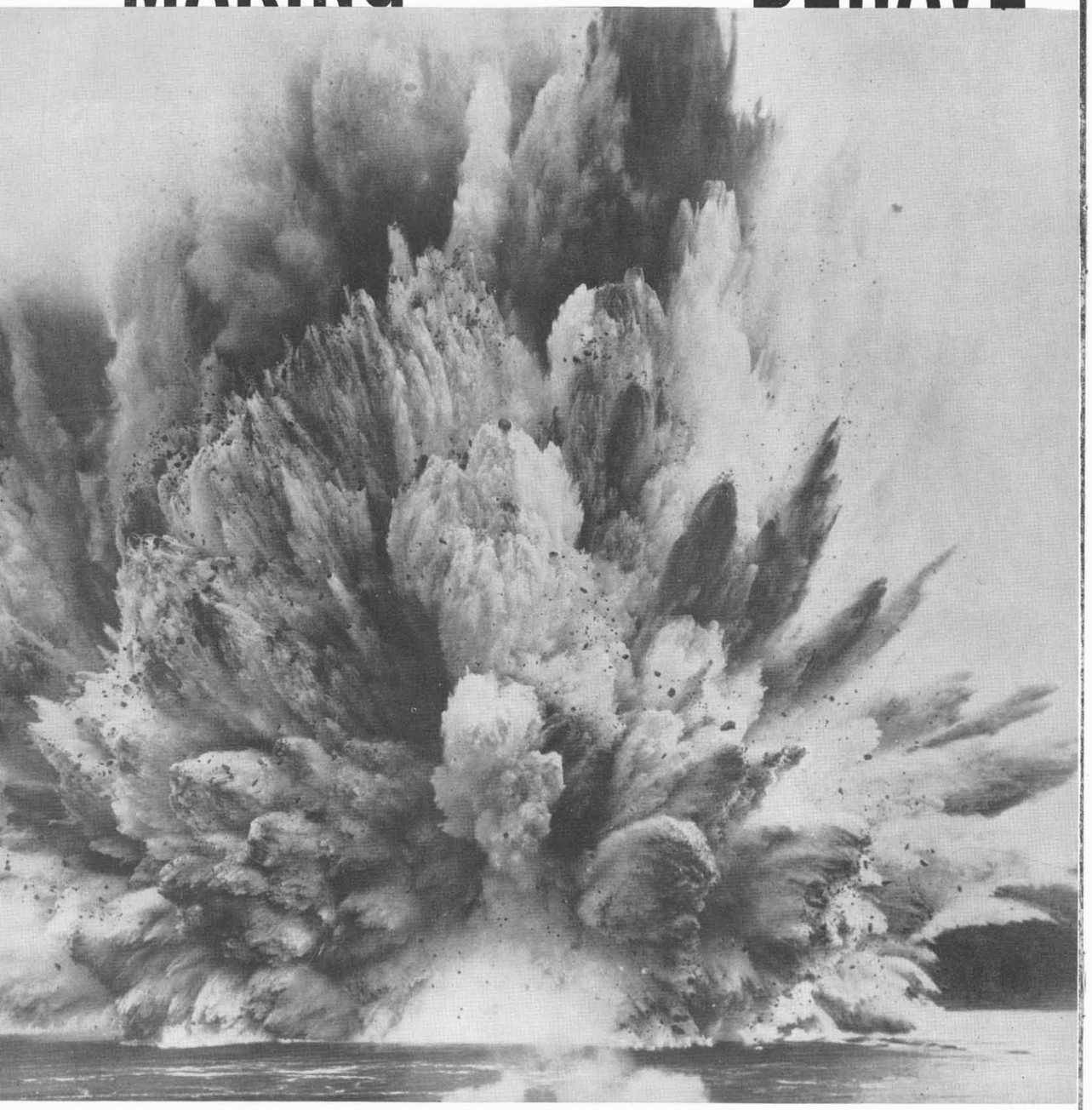
A real Scottish kilt never needs weights to hold it down: the heavy woolen tartan cloth is weight enough. And it is tailored so that the tartan pattern always "matches." In spite of the many pleats, (as many as 28 or 30 in back), the kilt, from a distance of a few feet, appears to be a flat, unbroken cloth.

Since the garment has no pockets, money and keys are kept in a "sporran," a large purse that hangs from the waist. For ordinary daytime wear, a Scot selects a sporran made of leather. But for evening wear (kilts are worn quite effectively with formal evening jackets) he may choose a sporran of white or spotted sealskin trimmed with silver.

"Sports" kilts now are sold to women and girls for skating; they are also sold in "street-length" skirts. But these ladies' kilts aren't the real kilts. The *real* kilt will always be a brave man's garb. ■

This Scot piper has no monopoly on pride — or the kilt. The Greek youngster (right) wears a kilt that is based on the pure white kilt worn by Greek regiments.

MAKING BLASTS BEHAVE



Experts control explosions with such precision that dynamite touched off in the midst of big-city hustle hardly jostles a teacup

WILL Rogers, when passing through Terre Haute, Indiana, had once described that town's railroad station as "the only waiting room in the country with a silo growing out of it." The silo was a 154-foot-tall, gothic-arch-topped tower, once used to watch for approaching trains where the Chicago & Eastern Illinois and Pennsylvania Railroad tracks crossed. Last summer the station was to be demolished. But because of its size and heavy brick construction, dismantling estimates for the silo tower proved prohibitive. The owners decided to dynamite it.

Several decades ago the tower might have simply been laced with explosives and blown to smithereens, perhaps spraying the countryside with fragments. In recent years, however, scientific blasting techniques have prevailed. Waller Caldwell, a demolition expert for the Atlas Powder Company, drilled three holes in the base of the tower, wide enough to insert eight pounds of dynamite. When the dynamite exploded, it knocked out the tower's supports, collapsing the tower between two railroad tracks — without touching either one. Several houses within 200 feet of the blast had barely been shaken. The massive tower had been felled with the skill of a lumberjack toppling a redwood tree into a narrow clearing.

Such blasting feats are common today, and lately have become as much of an art as a science. Last year more than a billion pounds of dynamite were detonated in the United States, most of it in mines and quarries. But other increasingly important uses of explosives are in road construction, stump-blasting, ditch-digging, seismic prospecting, gas and oil well shooting, salvaging iron from ships, firefighting, and building construction and demolition.

Much of this use of controlled explosions occurs within heavily populated cities. Construction crews often blast inside occupied buildings to cut out foundations for new equipment. Excavators set off dozens of dynamite shots in New York subways each year with pedestrians above unaware of it. In Des Moines a demolition gang once blew three 30-ton steel vaults into scrap in a bank basement without a complaint by the depositors.

Whatever the job, dynamite or one of its many variants is applied. It is perhaps the most efficient, controlled source of releasable energy available in the world. In a chemical explosion, solid particles are instantly transformed into hot, expanding gases which, in a furious effort to escape, hurl aside rocks, steel or anything in their paths. Upon detonation each pound of dynamite liberates enough energy to lift a 1,000-pound boulder 900 feet into the air. Approximately forty carloads of dynamite a day are fired in the United States — most of them in blasts of a few hundred to a few thousand pounds.

One of the examples of precision dynamite blasting occurred in 1944 when engineers ripped a 13-mile tunnel through a Colorado mountain as part of the Big Thompson Diversion Project. Starting on opposite sides of the mountain, they met in the middle with only a 3/4 inch error at the point where the shafts joined. Sculptor Gutzon Borglum used 6,000 pounds of dynamite contained in 40,000 detonating caps to sculpture the features of Washington, Jefferson, Lincoln and Theodore Roosevelt in the rock face of Mount Rushmore, South Dakota. But dynamiters claim precision blasting came of age in July of 1930 at the Saguenay River Power Project at Chute-A-Caron, Quebec. Contractors had built a generating station, but to finish the power dam to serve it, they needed to side-track the rain-swelled river into a diversion channel.

Ordinary methods failed until Sam Russell, a DuPont blasting expert, was consulted. He conceived a fantastic scheme. Russell built a concrete block, 90 feet high, 45 feet wide, and weighing 11,000 tons. Standing on end and shaped to match the contour of the stream bed, it was to be dropped into the stream, thus damming the running waters.

Skeptics challenged his sanity, but Russell calmly stuffed 1,000 pounds of dynamite in carefully charted holes drilled in the pier beneath the block. When the dynamite detonated, the concrete block slid into place with a roar a mere inch off course.

The history of explosives dates back to the fourth cen-

The secret of toppling a tower into a specified area lies in the use of the right amount of dynamite at the right place.

Planting dynamite calls for trained technicians, but in their hands the explosive is a useful tool for heavy jobs, such as pushing this subway through rock at Long Island City, New York.

Flying debris is prevented by covering the blast site with tough, steel nets.

MAKING BLASTS BEHAVE

tury and the development of "Greek Fire," a blend of resin, pitch, sulphur, naphtha, and other combustibles which was hurled in a fiery mass against fortresses, onto ships and into the ranks of enemy warriors. Explosives as we know them today, however, didn't appear until the thirteenth century when an Englishman invented black powder and a German invented firearms to utilize it. In 1627, Kasper Weindl pioneered industrial blasting in the mines of Schemnitz, Hungary.

Primitive black powder was the only practical commercial explosive until the middle of the nineteenth century; then in 1846 Antonio Sobrero, an Italian chemistry professor, discovered the explosive properties of nitroglycerin. Because it detonated too easily, nitroglycerin's only practical use was in medicine as a heart stimulant. Then in 1867, a nitro can in one of Swedish industrialist Alfred Nobel's plants leaked onto the ground consisting of a porous earth called *kieselguhr*. The resulting, stable compound was dynamite. Nobel was responsible for the subsequent development and exploitation of the explosive, although he is perhaps better known today for the annual awards named after him, including the Nobel Peace Prize.

Today about 200 different types and grades of high explosives exist in all possible combinations of strength, density, water resistance and flammability. Ordinarily, they are ignited by a detonator called a blasting cap. The cap is a thin copper or aluminum cylinder, a few inches long, which is loaded with a highly sensitive explosive. Imbedded in the main explosive charge, the cap is set off by a burning fuse or electrical current. The force of the cap explosion detonates the main charge without any noticeable interval between the two explosions. Ammonium nitrate explosives have recently taken over as much as 40 per cent of the market. These blasting agents, containing no nitroglycerin, can be burned, crushed, drilled, chopped, shot at or dropped great distances without detonating, but suitable primer charges explode them every time.

The art of precision blasting has also been aided, since shortly after the war, by the development of a millisecond delay system. The key to this method is an electric blasting cap that fires from a common circuit in multiples of 25 to 30-millisecond sequences instead of the normal one or two-second intervals. Thus a 1,000-pound blast can be divided into ten separate 100-pound explosions going off fractions of a second apart. The full power of the 1,000-pound blast is retained, but the noise and vibration is equal only to each separate 100-pound explosion.

Development of millisecond blasting techniques has paved the way for easy demolition in congested areas. While working on the TVA project, engineers split open a mountain in Tennessee with more than a million pounds of dynamite, yet people in the nearby town of Bristol didn't even hear the explosion. A twin tube tunnel is currently being blasted out of rock at the approach to New York's George Washington Bridge. Eight lanes of traffic daily flow past the excavation undisturbed by the detonations. In constructing underwater connections to a new water filtration plant, a five-mile tunnel was dug through sedimentary limestone beneath Chicago's Gold Coast with the use of explosives, though most Chicagoans above were completely unaware of the work.

Because explosives are so potentially dangerous, extremes of caution have resulted in a safety record unmatched by most other industries. In 1959, for each million man-hours of work, American industry had about six and a half accidents that resulted in lost man-hours; the high explosives industry had two.

In the many explosives plants throughout the country, workmen wear special shoes with rubber soles. No matches are allowed. Should someone walk into a building, thus exceeding its occupancy limit (designed to reduce potential casualties), one of the workers will get up and quietly walk out. To remove all possibilities of a metal-induced spark, wooden buggies are used to transport the explosive compounds along wooden tracks to wooden mixing machinery. All of the buildings are well bunkered. In 1957 when a nitro plant exploded, the three men inside were able to get out in time, and the only damage was a big hole in the ground.

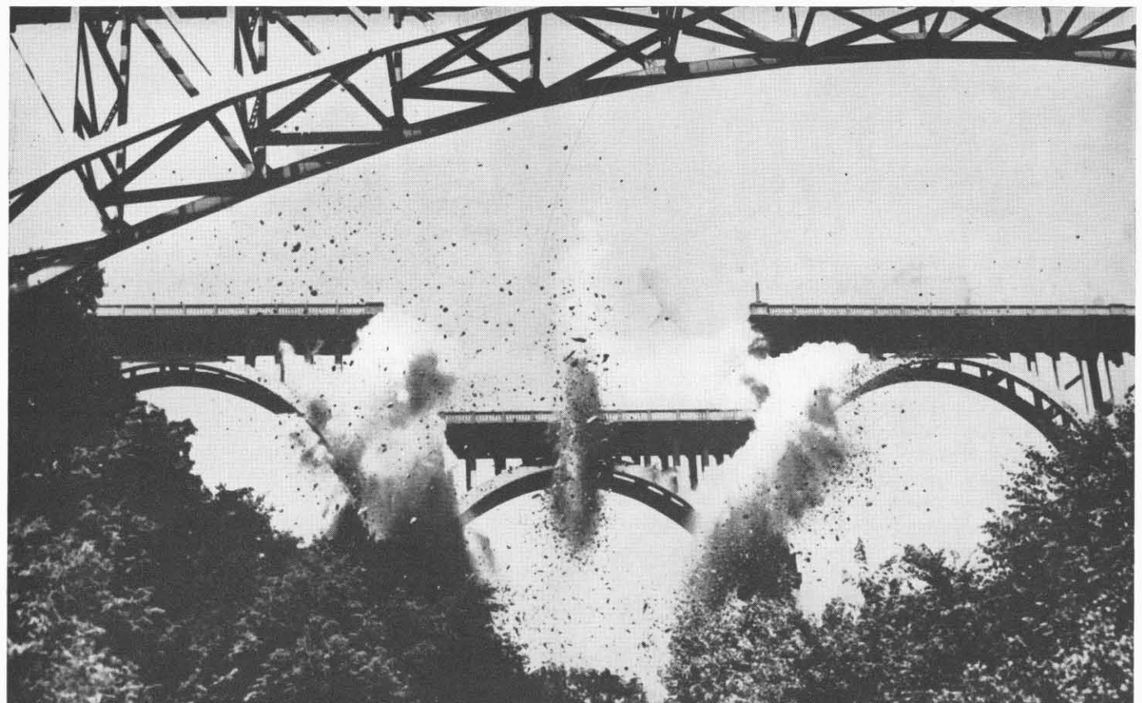
The largest non-atomic explosion ever touched off on this continent occurred that same year in Utah. Some 1.7 million pounds of explosives pulverized 3 million tons of rocks that were then used as fill-in in constructing a causeway across the Great Salt Lake for the Southern Pacific Railway. But perhaps even more spectacular are demolition shots within city limits. The secret of safe and effective building demolition is the placement of small charges in key locations. When the primary underpinnings of a structure are cut, its own weight will bring it down.

In one recent wrecking job, two eight-story apartments were dynamited to rubble in downtown Washington, D.C. only about 100 feet away from the State Department office building. City engineers had worried because of the building's proximity to a vast network of water, gas and steam lines. Though within 20 feet of the building, the utilities were undamaged. Seismologists claimed that the vibration caused by the explosion equalled that of a heavy truck passing by on the street.

Realizing that people, especially home-owners, fear and distrust explosions, engineers have estimated that a human being can feel a force only one hundredth of the force necessary to crack plaster or masonry. The slightest tremor will often send him to his basement to see if he can blame the crack in his foundation caused by settling to the dynamiters. To prevent this, one operator in New Jersey erected a glasshouse adjacent to the face of his quarry. The glasshouse stood for two years within 48 feet of the blasting area. Not one pane of glass broke nor did a crack appear in its concrete foundation. And not one person in the vicinity came to the quarry owner with complaints about the frequent explosions.

Such blasting is possible because today's experts have learned to make dynamite's explosive fist react like the hand of an artist. ■

Center span of outmoded bridge, seen through the arch of its replacement, crumbles under impact of three dynamite charges.



Ibn Battuta,

Traveler from Tangier

When it comes to globetrotting, even Marco Polo takes a back seat to this fourteenth-century voyageur

IN the year 1349 a dusty Arab horseman rode slowly toward the city of Tangier on the North African coast. For Ibn Battuta, it was the end of a long journey. When he left his home in Tangier 24 years earlier, he had not planned to travel distant roads all during the years that took him from young manhood to middle-age. From his mount, Ibn Battuta surveyed the white spires and homes of Tangier spreading in a crescent along the Atlantic Ocean. He tried to remember how the city had looked when he left it behind almost a quarter-century ago.

In 1325 Ibn Battuta had been a young man of 21, reluctantly leaving his parents to make his first *hajj,* or pilgrimage, to Mecca some 3,000 miles due east. He had covered those 3,000 miles and then had gone on to travel another 72,000 miles! Many Muslims made the pilgrimage to the Holy City but then returned home, for it was not an age when people were accustomed to straying from home for long periods. When Ibn Battuta began his travels, it was, in fact, more than 125 years before such renowned voyagers as Columbus, de Gama and Magellan set sail. It was no wonder, then, that Ibn Battuta returned to his native city, where his parents had died in his absence, to find himself a famous wayfarer. A contemporary described him as "the traveler of the age," adding "he who should call him the traveler of the whole body of Islam would not exceed the truth."

Ibn Battuta was indeed the traveler of his age. His wanderings took him to Spain, Russia, Turkey, Persia, India, China and all the Arab lands. His description of the religious, political and social conditions of the lands he visited — in some cases the only record — give insight into medieval Eastern civilization. Authorities who estimate Ibn Battuta's journeys at more than 75,000 miles say that the distance was not exceeded by anyone — including Marco Polo, Magellan or Columbus — until the age of steam.

Travelers have many reasons for visiting foreign lands. Marco Polo was a merchant and Columbus an adventurer. Ibn Battuta, however, was a theologian, poet and scholar, a humanitarian in an age when life was cheap. He left Tangier to visit the holy places of his faith and found himself curious about the wide world and eager to learn more about it.

Born in 1304, the son of Abdallah, a *qadi,* or local judge, Ibn Battuta as a young man received a future *qadi's* customary education, essentially a thorough study of religious literature and poetry. He is, in fact, the only great traveler to describe some of the places he visited in rhymed verse. His style (translated without rhyme) can be imagined from his description of the Cairo of 1326: "I arrived at length at Cairo, mother of cities and seat of Pharaoh the tyrant, mistress of broad regions and fruitful lands, boundless in multitude of buildings, peerless in beauty and splendour, the meeting place of comer and goer, the halting place of feeble and mighty, whose throngs surge as the waves of the sea, and can scarce be contained in her for all her size and capacity.

"On the Nile," noted the amazed traveler, "there are 36,000 boats belonging to the Sultan and his subjects."

From Cairo Ibn Battuta toured through Jerusalem, Aleppo and Damascus, where he joined a caravan of pilgrims bound for Mecca. These caravans were a familiar sight in Islam. They consisted of Muslims, rich and poor, ignorant and educated, soldier, merchant and scholar, who were fulfilling the duty of every Muslim to visit Mecca at least once in his lifetime if possible. In the towns and cities along the way they were fed, sheltered and entertained in rest houses and hospices maintained by generous benefactors. This traditional hospitality — which in Arab countries extends to all guests — made it possible for Ibn Battuta, who was not rich, to travel with a light purse.

He made the *hajj* to Mecca seven times. The second time he stayed in the city three years to study with the great Muslim scholars. This pilgrimage was preceded by a tour of Persia, including a visit to the then fabled capital of Islam, Baghdad, where he found public baths that were unmatched anywhere in the world. "Each establishment," wrote the traveler, "has a large number of private bathrooms, every one of which has also a washbasin in the cor-

ner, with two taps supplying hot and cold water. Every bather is given three towels, one to wear round his waist when he goes in, another to wear round his waist when he comes out, and the third to dry himself with."

At the end of three years of study in Mecca, Ibn Battuta set out for India, where he hoped to join the court of the powerful and generous Sultan of Delhi. By this time he had made it a rule "never, so far as possible, to cover a second time any road." He went to Jiddah, Mecca's nearest port, where he turned down passage on a ship he considered unsafe. "This was an act of providence," he recalls, "for the ship sailed and foundered in the open sea, and very few escaped."

After touring through Egypt, Syria, Turkey and Russia, Ibn Battuta finally reached Delhi, where he remained in the sultan's service as *qadi* for eight years. At the end of this time the sultan called him. "I have sent for you to go as my ambassador to the king of China," he said, "for I know your love of travel." The trip was to be a memorable journey.

No sooner had Ibn Battuta left Delhi than he was taken prisoner by unfriendly Indians. They marked him for death, but one of the band, a young man, took pity on him and let him escape. After eating roots and nuts and hiding out in strange countryside for eight days, Ibn Battuta finally rejoined his entourage and proceeded to Calicut, a trading port near the tip of India from which he planned to sail to China.

"We entered the harbour in great pomp, the like of which I have never seen in those lands," he noted, "but it was a joy to be followed by distress." Then he describes the great Chinese junks that monopolized traffic to China.

The large junks had three masts and up to twelve sails, which were "never lowered, but turned according to the direction of the wind." Three smaller vessels usually accompanied the junks to tow them if they became becalmed. The junk was the fourteenth-century equivalent of the modern ocean liner. It even carried its own fresh food: "The sailors," notes Ibn Battuta, "have their children living on board ship, and they cultivate green stuffs, vegetables and ginger in wooden tanks."

In Calicut Ibn Battuta loaded his party and the presents for the Chinese emperor on a junk. His own belongings were put onto a smaller vessel called a *kakam*. The junk, as it made its way from the harbor, was caught by a sudden gale which whipped up the sea and dashed the ship onto shoals. All was lost. The smaller *kakam* then sailed away with all of Ibn Battuta's goods. He watched the *kakam* grow smaller in the distance with nothing to his name but ten dinars and the carpet he had slept on.

From past experience with foreign rulers, he wisely decided not to return to Delhi, for while the sultan was a generous man, Ibn Battuta reasoned that he might not have understood why of all the treasure and envoys, only Ibn Battuta remained intact! So the stranded ambassador, with the typical resourcefulness of a seasoned traveler, attached himself to a local Muslim potentate who appointed him *qadi* in the nearby Maldive Islands. Ibn Battuta's description of the customs of these islands was the first to reach the outside world.

When Ibn Battuta finally sailed again for China, he landed at Zaytún, the storied "Shanghai" of the thirteenth and fourteenth centuries, which may have been what is today the island of Amoy, opposite Formosa. He traveled through China as an ambassador, although he actually represented no one and was without credentials. Despite the fact that the Muslim and Chinese empires were not on the friendliest terms, Ibn Battuta journeyed from Zaytún to Hangchow and Peking and back without any difficulty. On the contrary, he was feted in most places, a testimony to his charm and native diplomacy.

"There is no people in the world," noted Ibn Battuta, "wealthier than the Chinese." He called Hangchow "the biggest city I have ever seen on the face of the earth." This was the same city described by Marco Polo as "beyond dispute the finest and noblest in the world."

The Arab from Tangier turned homeward the way he had come, except that he avoided Delhi altogether. He passed once again through Mecca and Baghdad and, in 1348, stopped at Damascus. There he enquired about one of his sons whom he had left 20 years before. He discovered that the boy had been dead 12 years and his own father 15.

The Black Plague was then raging through the Middle East. At Cairo Ibn Battuta reported a daily death toll of 21,000, a figure that historians confirm. Ibn Battuta passed through town after town scourged by the plague, but providentially he escaped infection for had he been stricken, his name would have been soon forgotten. He had not yet recorded his travels.

Even after he returned to Tangier in 1349, Ibn Battuta was not content to spend his remaining days at home, where he might have passed many a pleasant hour spinning stories of distant lands for his friends. His mother also had fallen victim to the plague during his absence, and with nothing to keep him in Tangier, he was soon planning a trip to Spain. After Spain, three years later, Ibn Battuta began his last journey. He traveled through west-central Africa, where he mistook the Niger for the Nile, and visited Timbuktu, a city that was considered legendary by Europeans because none of them had been there. In 1354 the great traveler was called to Fez by his sultan, who ordered him to dictate a record of his wanderings to a court scribe.

Strangely enough, Ibn Battuta's exploits were lost to the Western world for 300 years. Not until the nineteenth century, when his *Rihla* (*Travels*) was discovered in Algeria, did his extraordinary roamings come to light. In contrast, Marco Polo dictated an account of his journeys to a contemporary while they shared a prison cell in 1296, and copies had circulated all over Europe by the fifteenth century. Had Ibn Battuta's work received the same attention, his name would rank alongside Marco Polo's as a synonym for world travel. ■

Introducing...

Hymanoptera,

The Ant

Brains and brawn

mix to good purpose in

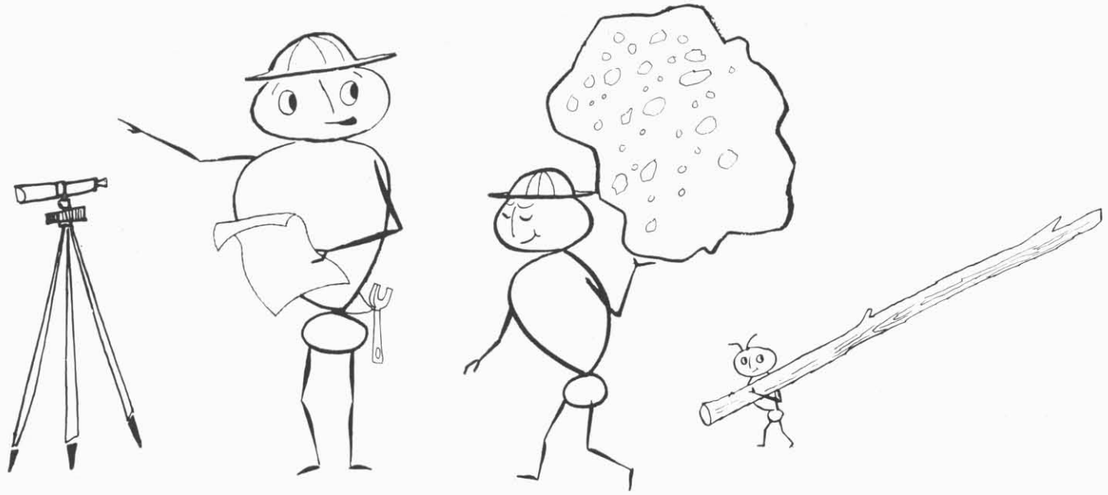
that social-minded

member of

the "bug" set

THEY are ferocious warriors and plunderers, without a shred of mercy or fear. They attack in overwhelming numbers, hundreds of thousands in disciplined regiments, swarming across the fields, marching steadily, inexorably, toward their quarry over pebbles, rocks, walls, over streams which they ford on twigs and leaves and on bridges of their own members' corpses. All of the smaller living things they encounter are torn to pieces; the larger ones flee in terror. Even man gets out of their way – for there have been cases when these rapacious invaders have made short work of even him!

They are the formidable red army ants of the tropics, raiding the abodes of their less powerful relatives, the black ants, slaughtering them when they give battle, and carrying off their children who will work for them, care for



HYMANOPTERA, THE ANT

and feed them, for army ants are soldiers, not suited for household chores.

The young captives will not be slaves, though, not in the true sense of the word, for they will occupy no inferior status, but will share equally in the rights and privileges of the ant colony.

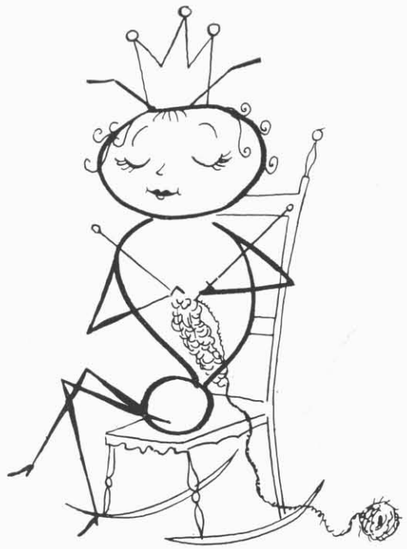
In all of nature there is no animal that is more social, that carries community life to more of an extreme, than *Hymanoptera* – the ant. Each member of a colony works endlessly, prodigiously, selflessly at his appointed task and is forever ready to lay down his life for the common good.

Observe, sometime, one of these astonishing little creatures dragging a grasshopper seven times its size and weight home for a community brunch. Never for one second, unless it is lost, will it deviate from its path nor pause for a breather. Place a rock in its way and with Herculean strength and indomitable determination, it will pull, push and even carry its immense burden up the sheer precipice and down the other side. Place the rock again in front of it – four, five, a dozen times – and without a sign of protest, the ant will repeat this incredible feat.

This is the worker ant – the imperfectly developed, infertile female – performing just one of her numerous daily tasks. Besides procuring food, she feeds and takes care of the children, or larvae, and the queen ants; she cleans and tidies the house, and with the soldier ants, defends it against attackers. Not exactly what would be called an idle or an easy life!

The queen ant, unlike the queen bee, is not a despotic ruler but merely a benevolent mother. Having enjoyed a better diet during infancy, she is larger than the workers, she is fertile and has wings. Some of the males also have wings, and on the day of the marriage flight – an important event in the ant kingdom – they accompany the queen on her one and only venture away from home – a short and ecstatic aerial honeymoon which they don't survive. Following the nuptials, the queen, now a widow, tears off her wings and absorbs her own flight muscles (as food for her first batch of young), neither of which she will ever need again. She then settles down to raising an enormous family, tending the first eggs herself. After that, she never lifts a mandible in household chores. She has plenty of workers for that, and to wait hand and foot on her – even to partially digest her food for her. All she does is lay eggs – thousands and thousands of them.

This constant function, while perhaps monotonous, doesn't seem to tire or age her appreciably, for she lives a very long and productive life, much longer than other in-

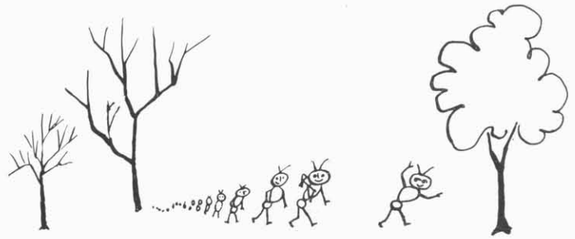


sects. Queen ants have been known to live in captivity up to *twenty years;* workers up to ten.

There are over 125,000 known species of ants; this number is exceeded only by beetles, of which there are over 300,000. There are black, red, brown, yellow and white ants, some carnivorous, some vegetarians, some that have eyes and some that don't, some that bite and others that protect themselves by squirting a burning formic acid.

The carnivorous ants are generally man's friend, for they destroy many damaging crop pests. In Africa and South America, natives often welcome the marauding red ants in their homes, for they know that after these have swept through their quarters, not a roach, not a spider, not a crawling insect will be left alive.

The vegetarians – especially the leaf-cutting ants which



can denude entire trees in a matter of minutes – are something else again. Stinging fire ants in citrus groves and the tiny household ants that get into food and wood crevices are also nuisances.

But in addition to protecting crops, ants help humans in other ways – such as in turning soil and making it per-

vious to water – and they are, by and large, more beneficial to us than harmful as some of our best friends and allies in the insect world.

While the actions of insects are guided chiefly by instinct and tropism (certain reactions to certain stimuli), ants, which are among the more highly developed forms, have a sense of touch, smell, taste and sight – although they don't depend on their vision much, for it is very poor. Their sense of direction is guided by their olfactory organs, situated in the antennae. Worker ants always return home from their food hunts by exactly the same route they came. When they are lost and seem to be scurrying around aimlessly, it is because they have lost the scent path.

So easily do they become lost outside their nests and so afraid are they of this, that they will not deviate an inch on their return journey; this is why they will carry their burdens over obstacles rather than around them. Dim-witted though this may seem, it cannot be denied that most of their actions are wonderfully "intelligent." Certain species, for instance, use the silk from their larvae to weave the edges of leaves together, securing their nests. Others span gaps by clinging to each other in a living chain, over which a trail of workers can pass.

And in what other civilization or community would you find the likes of the honey ant? Some of its workers have evolved "social stomachs," which can be distended to enor-

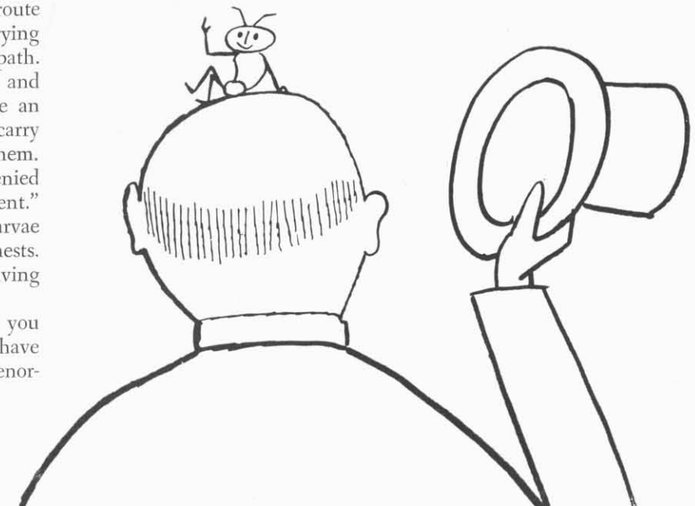
mous proportions so that they can act as living nectar bins for the rest of the clan. Too heavy to walk about, they are suspended by their claws in rows in a nest, where others can go to them when food is required.

Unlike other insects who do not profit from experience, ants have retentive memories. Flies will return to the same danger again and again, but not ants. When stymied by fly-paper, they have been known to build causeways over this perilous terrain out of bits of grit and sand, over which their workers can safely pass.

"All for one, and one for all." Should one of their members get stuck in a bit of jam, they will yank and tug at him until they get him loose – even though they will eventually have to cut off his head or legs to free him. Should one be attacked, they will rush to his aid.

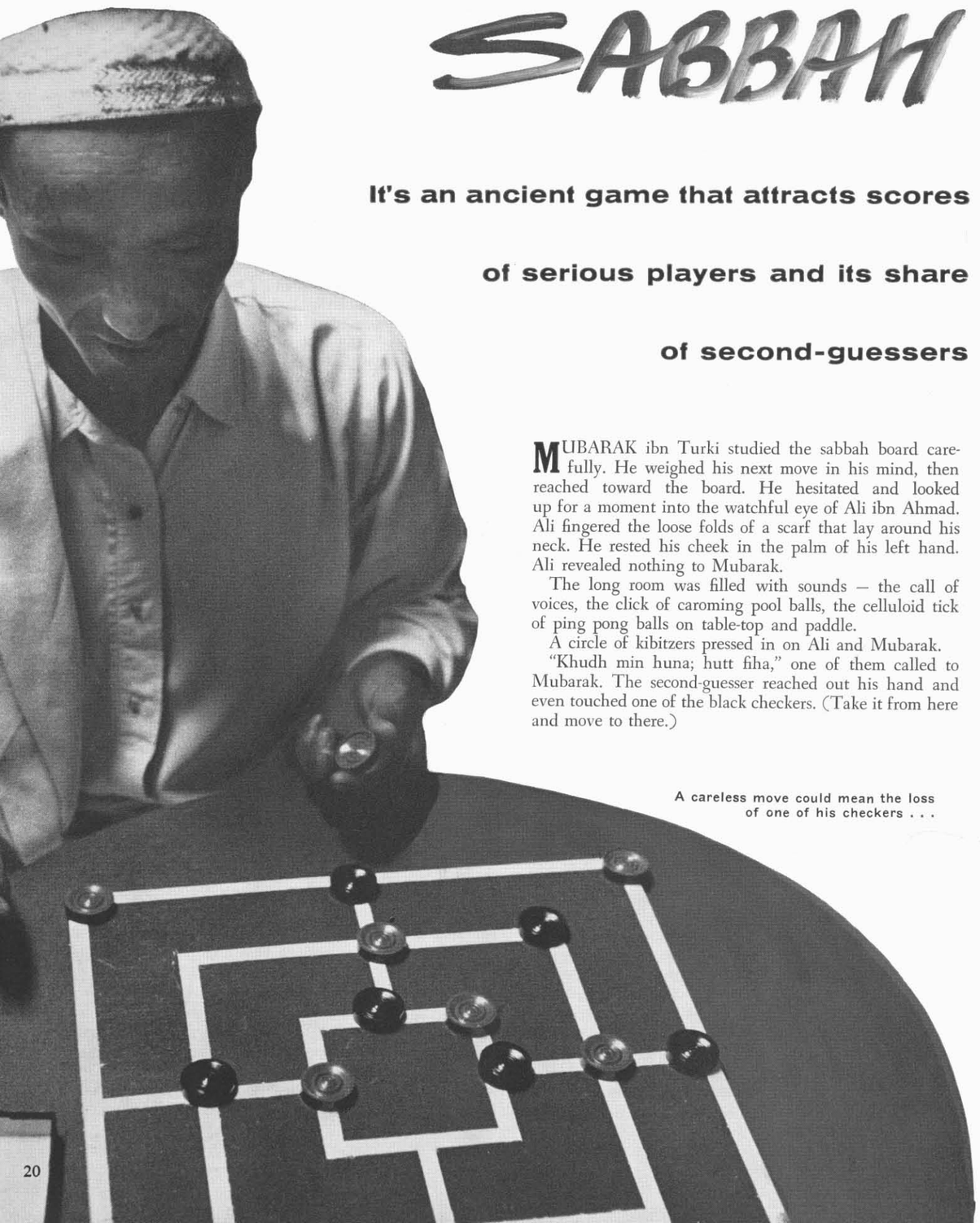
They are able to recognize every outsider who is not a member of their community, and because of the possible danger, no stranger is tolerated. But they are not inhospitable and occasionally invite guests – beetles, lice, mites – who share the nest and are treated as part of the family.

Among living things, for their size, ants are incomparable. From very early times they have attracted attention and praise for their intelligence, their industry and thrift, their strength and endurance, their ability to plan for the future and to improvise. Philosophers, as well as entomologists, have taken off their hats to them. Anyone who knows them and their truly amazing qualities and accomplishments will do the same. ■



SABBAH

It's an ancient game that attracts scores of serious players and its share of second-guessers



A careless move could mean the loss of one of his checkers . . .

MUBARAK ibn Turki studied the sabbah board carefully. He weighed his next move in his mind, then reached toward the board. He hesitated and looked up for a moment into the watchful eye of Ali ibn Ahmad. Ali fingered the loose folds of a scarf that lay around his neck. He rested his cheek in the palm of his left hand. Ali revealed nothing to Mubarak.

The long room was filled with sounds — the call of voices, the click of caroming pool balls, the celluloid tick of ping pong balls on table-top and paddle.

A circle of kibitzers pressed in on Ali and Mubarak.

"Khudh min huna; hutt fiha," one of them called to Mubarak. The second-guesser reached out his hand and even touched one of the black checkers. (Take it from here and move to there.)

Another hand reached out from the circle and pushed aside the first.

"La La" (No, no!)

The first man persisted: "Khudh min huna . . ."

Mubarak lost patience.

"Uskut," he shouted at both of them. They drew back. "Uskut!" (Keep quiet!).

He moved a black checker. But it was too late. Ali Ahmed swiftly slid a white checker along one of the shorter white lines on the green sabbah board. Three of his red checkers now lay in a line. Ali removed one of Mubarak's pieces from the board. And the way was also paved for Ali's inevitable victory move on his next turn.

Mubarak saw that he could not hope to win that game. He waved his hand over the board. The game was over. Ali had won two out of three games and was ready to proceed to the semi-finals of what may have been the first Saudi Arabian sabbah tournament in history.

The scene of the tournament was the Recreation Center of the Aramco al-Salamah Camp at Dhahran, Saudi Arabia. A program of mid-winter contests had brought forward the boundless skill of Saudi young men who have shown a keen eye and steady hand in ping pong, pool and a table version of shuffleboard. But the hit of the season was the pioneer sabbah tournament.

The game, which according to experts was played in ancient Tuscany, Rome and Athens, appears to have been enjoyed on the sands of Arabia for long generations, perhaps centuries. Tom Roy, a recreation director for the Arabian American Oil Company, used to watch Saudi Arabs pass the time by drawing a set of squares (one inside the other) in the sand and playing a game he had never seen before. The game was played by two players using flat and round stones, or date pits. Roy took a close look at the game one day, learned the name was "sabbah," and decided to incorporate the game into the recreation tournament program.

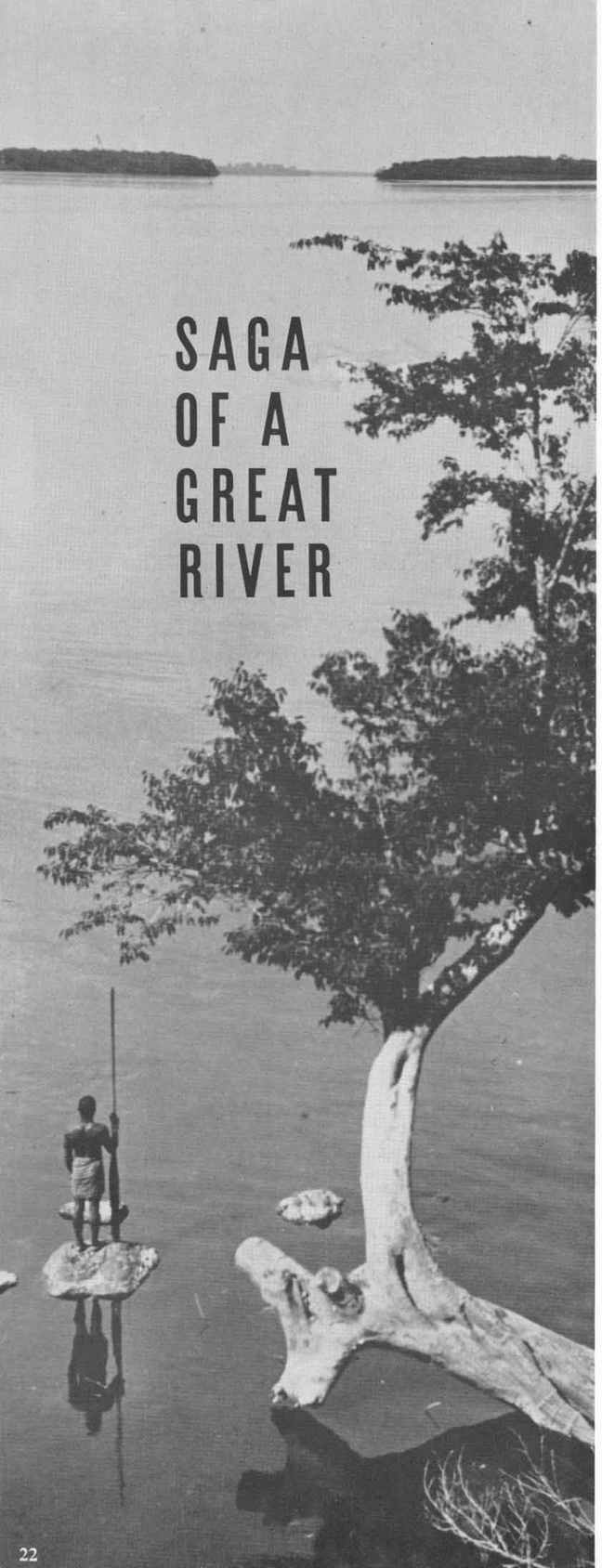
The rules were well known and the simple design posed no problem. Sufficient boards were painted, and Tom Roy raided the recreation center checker sets (each player uses nine checkers). The tournament lists were quickly filled and pairings made.

Sabbah combines elements of tic-tac-toe, chess and parchesi. It appears simple. However, a first-rate player employs many subtleties in preparing his key moves, carefully measuring probability in each play. His purpose is to eliminate, one by one, his opponent's checkers from the board.

By the time the tournament had reached its final stages, the crowds had grown enormously. Cameramen filmed the final round for showing on the Aramco television channel.

From the scattering sands of Saudi Arabia, sabbah has moved to the tournament game board. An ancient game has been touched by the glamour of television. However, the enthusiasm, the "wisdom" and the persistence of the kibitzer remains unchanged. Indoors or outdoors, on sand or table top, the game continues to benefit (in a manner of speaking) from his unstinted advice. And the impatient cry of "Uskut" only whets the appetite for quarterbacking from the sidelines. ■

. . . and onlookers are not bashful about pointing out how a careless move could have been avoided.



SAGA OF A GREAT RIVER

Highway, reservoir, fishery—
for 2,900 miles the Congo,
a giant lifeline, flows through
Africa's jungleland

"IT was hours past midnight when a female voice broke upon the night in one wild, hysterical, long-continued scream, a cry utterly horrible and inhuman . . . ."

The passengers on the little river steamer *Saionara,* some still awake on deck, others in their cabins trying to sleep in spite of the oppressive heat, listened in "an extremity of terror and awe." They had never heard a sound like it before.

But they were newcomers to Africa, medical missionaries on their way to their posts. They would hear other strange sounds soon enough. The unearthly shriek, the "female voice," they had heard this night had been the scream of a lemur, the monkey-like creature that lives high in the treetops of the black, equatorial forest of Africa.

A lemur's scream . . . the roar of a lion . . . the bellowing of a hippopotamus . . . the chattering and screeching of monkeys peering from the branches of the giant baobab trees — these are some of the sounds of welcome — and warning — each new traveler hears if he journeys into Africa by way of a giant river once called the Zaire.

Today it is called the Congo, and its main stream sweeps along in a bow-like curve, reaching out of the heart of Africa as if the river itself were the greatest of the huge pythons that live on its banks. The Congo has awe-inspiring proportions. Of all the world's rivers, only the Amazon, Nile and Yangtze are longer, but only one, the Amazon, stretches its arms into more square miles of drainage basin. Along its 2,900-mile length, straddling the Equator, the Congo drains almost 1.4 million square miles.

For centuries the Congo was one of the most mysterious rivers. It came to the sea out of a dark and unknown country inhabited by lions, serpents, cannibals and what else no one knew, for no one had been able to follow the river more than a few miles from its mouth on Africa's west coast. But stories enough had found their way out of the depths of the dark jungle through which the Congo ran — stories of primitive sorcery, of unspeakable rites, of the Leopard Men, more terrible than the beasts whose skins they wore. Dark was the color of the Kingdom of Congo, and dark the color of its great river. It was a land of fetid, steaming jungle into which no sunlight came — a miasmal world where nature had preserved her prehistoric form.

This was the way Joseph Conrad saw it in 1890, when he went up the Congo on a trading-company steamer. As a boy he had dreamed of going to Africa, and as a man of thirty-three he did go. He found the experience overpowering, and out of it came his great story *Heart of Darkness.* In that story he said that his journey up the Congo was "like traveling back to the earliest beginnings of the world."

It was the vegetation, the incredible profusion of green things growing, that startled Conrad at first, as it does everyone on a first trip up the Congo. For long stretches along the banks the trees grow so closely together that their foliage is not merely thick but almost matted. The branches overhang the river and vault it with a living roof so dense that green is turned to black. But at other places, the river runs across open country and through shining lakes filled with lotus and papyrus among which white cranes walk in slow dignity.

The Congo had its beginning as a lake in prehistoric times. It spread over much of the 1.4 million square miles of the Congo basin. Eventually this lake pushed its way to the Atlantic, forming the Congo. Other rivers joined it, adding their waters to its own. Since then, the Congo has been draining a huge basin, pouring 1.2 million cubic feet of water into the sea each second.

The Congo has two main sections. The upper portion is still called the Luabala. It was Henry Morton Stanley (the one who said "Dr. Livingston, I presume?") who proved that the Luabala was actually a part of the Congo. This was in the late 1870's, and Stanley's expedition was in the best tradition of romantic adventure — an epic full of color and danger, replete with cannibals and crocodiles. After starting out at the Luabala's source, Stanley traced the river to its junction with the Congo, then followed the latter almost to its mouth.

At one point in his exploration down the Congo, Stanley reached a great bulge in the river. Here it spread out into a lake 20 miles long and 17 miles wide, with a large island in its center. Cliffs of silvery sand rose gleaming on the northern bank. They reminded Stanley's companion, Frank Pocock, of the white chalk-cliffs on the English coast and he shouted happily to Stanley, "Why, here are the cliffs of Dover, and this singular expanse we shall call Stanley Pool." The shining walls of sand at Stanley Pool are called the Dover Cliffs to this day.

Although the Congo's color is for the most part a muddy brown, for one short stretch its appearance changes remarkably. In its stream can be seen several distinct bands of colors — black, grayish white, green and blue. These mark the waters of various tributaries that flow into the Congo, each of a different hue. After some miles, the Congo narrows and deepens as it passes through a long gorge, and here the piebald stream is thoroughly churned into a rich sepia.

The longest navigable portion of the Congo is the thousand-odd miles between Stanley Pool, near Leopoldville, and Stanley Falls. But "navigable" in the case of the Congo does not mean what it means for, say, the Mississippi. Anyone can take a small boat down the Mississippi without having his progress impeded by hippos, sandbars and floating islands — or by tangles of snakes that may drop out of the branches of overhanging trees. One traveler has told of the kind of experience a trip along the Congo can provide. To escape the sun he had brought his boat under the heavy canopy of foliage extending from the trees along the bank. But on looking up he noticed that "every branch and every twig began to squirm. Coiled among the mosses were innumerable snakes . . . ." In his haste to get away from them, the pilot ran the boat onto a hidden sandbar in the middle of the river. He tried for three hours to get the boat off the bar, then gave it up and spent the night marooned.

Over three of its sections, violent rapids make the Congo unnavigable. The best known of these are the seven cataracts that make up Stanley Falls, just south of Stanleyville. An even larger number of rapids keeps the Congo frothing between Leopoldville and Matadi, near the river's mouth at the Atlantic. Stanley lost several of his party in these wild cascades. One of these was Frank Pocock, who "insisted that his crew should shoot the Massassa Falls. The whirlpool below sucked all down to the soundless depths, out of which Frank and two young Zanzibaris never emerged alive."

The roaring, churning falls of the Congo are typical of the violent beauty of the river and the land it courses through. It is a varied beauty. In the Chenal, the great 125-mile long gorge that leads into Stanley Pool, the river becomes deep and races between steep cliffs as much as 800 feet high. Here the Congo casts off its tropic aspect and could almost be taken for a river in Wales or Canada. But for most of its length, the Congo's beauty is tropical.

The vegetation along the Congo is lush and brilliant. There are the huge baobab trees, massive survivals from a prehistoric era whose trunks often measure 30 feet in diameter. There are stands of 60-foot-high hardwood, aloof in little clearings of their own. And everywhere there are the great oil palms, their fronds hung with the nests of weaver-birds. Vines and brightly flowered creepers wind through the trees and heavy tangles of moss drape them, helping to create the incredible density of growth that even the African sun cannot penetrate. From the deck of a river boat travelers can see elephants drinking on the

At cities such as Leopoldville, the Congo emerges briefly from the jungle to flow through modern, industrialized areas.