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FEZ, HEART OF MOROCCO

Africa's "Imperial City" Retains Its Teeming Streets, Cluttered Shops, Glamorous Moorish Homes and Mosques, Amid the Peace of French Rule

BY GORDON CASSERLY

AUTHOR OF "THE WHITE CITY OF ALGIERS" AND "TROPICITANIA, WHERE ROSE RESERVES SWAY," IN THE NATIONAL GEOGRAPHIC MAGAZINE

IN the northwest corner of Africa spacious Morocco sprawls like a lazy Colossus with head bathed by the rushing waters of the Strait of Gibraltar and feet planted in the sandy wastes of the Sahara.

A giant, indeed, but one who can call no part of his person his own. For the right half of his forehead is International—the small neutral zone of Tangier (225 square miles); the rest of his head, his left shoulder, and a tiny patch of his ankle are Spanish (13,125 square miles), while all that remains of his big frame is ruled by France (some 200,000 square miles).

A polite fiction pretends that the Sultan Sidi Mohammed is master of him from crown to toe. Certainly His Sherifian Majesty's laws—if approved by the protecting powers, France and Spain—are obeyed today as never were the decrees of his predecessors in all the stormy history of the troubled land.

The unconquered mountaineers of the Rif and the Atlas paid no more heed to Sultans than they had to Cæsars when Rome professed to rule Mauritania. But now, their forays restrained by the soldiers of France and Spain, they sullenly acknowledge Sidi Mohammed's sovereignty—with ever-watchful eyes fixed on his European overlords.

The chaotic mountains of the Rif rise almost from the waters of the Mediterranean and face Gibraltar. They are practically the Spanish Zone of Morocco. South of them runs the corridor of Taza, the Royal Road of Sultans, the passage from east to west trampled by the feet of invading armies.

Then come the successive ranges of the Atlas Mountains—the Middle (Moyen), the Great (Grand), with an average height of 10,000 feet and with peaks clad in eternal snow, and the Anti Atlas. The western half of Morocco consists chiefly of plateaus, steppes, and fertile, level plains impinging upon the low, sandy beaches of the Atlantic, where the French have built a fine harbor at Casablanca (see The Society's New Map of Africa, a supplement to this issue of THE GEOGRAPHIC).*

RABAT THE BRAIN, FEZ THE HEART

Near Casablanca is Rabat, the brain of Morocco. For here is the seat of the Sultan's government, and of the real ruler of

*See "Beyond the Grand Atlas," by V. C. Scott O'Connor, in the NATIONAL GEOGRAPHIC MAGAZINE, March, 1932; "Across French and Spanish Morocco," by Harriet Chalmers Adams, March, 1925, and "The Story of My Captivity," by Ion Perdicaris, March, 1906.

Photograph from Gilbert Grosvenor

MUFFLED FIGURES DICKER FOR WOOL AT THE MARKET OF BAB MAHROUK

Over the sun-baked expanses of Morocco roam more sheep than people. Dark, impassive men from the countryside bring the fleece to the city and sell it here at the walls of Fez. City men in white burnooses walk about, examining critically and driving shrewd bargains.

the French Zone, France's Resident General (see Color Plates II and IX).

If Rabat is the brain of Morocco, Fez is its heart. Almost equidistant from the Atlantic and the Mediterranean, and nearly a hundred miles from either is this storied city, still the political and religious center of Morocco.

I stand on the hillside and look down, in wonder and admiration, on the tree-shaded valley in which lies once-turbulent, always-exotic, now-peaceful Fez. It is a chessboard, checkered in countless tiny squares which are the flat roofs of its myriad houses, the edge of the board being the lofty city walls.

Rather, there are two chessboards: Fez El Bali, Fez the Old; below me, but higher along the steep slope is Fez Djedid, Fez the New. It *was* new in A. D. 1276 (see Color Plate XII).

Like chessmen left scattered aimlessly about the board stand the slender minarets of the many mosques. On every side rise the hills crowned with forts old and new, forts built by long-dead sultans to cow their rebellious subjects within the city, others erected by the French to defend Fez against the Berber tribes outside the walls.

Beyond the rounded hills, away to the south, are higher mountains covered with snow, for this is a cold land in winter; and the month is November. But in summer the arid steppes are waist-high in flowers.

The city at my feet appears now as it did through the long centuries of Moslem domination, since Arab invaders built it somewhere about A. D. 800; as it was before ever the Infidels entered it except as slaves or as missions of Christian States humbly seeking to propitiate the Sultan.

It remains as it was when still the home of the Sherifian rulers, the real capital, the enlightened, artistic, magnificent city second to none in all Islam, when in the 12th century it boasted 785 mosques, 480 inns, and 120,000 private houses.

AIRPLANES, RAILROADS, AND SAFETY!

But hark! A humming drone fills the air; and high over the venerable city flies an airplane. France rules the sky above and the soil beneath: the Sultan is a shadow in Rabat. Away beyond Fez Djedid, look-

Photograph by Compagnie Générale Aéropostale

THE AERIAL CAMERA PEEPS INTO A SULTAN'S PRIVATE GROUNDS

The Imperial Palace at Fez is surrounded by high walls and spacious gardens. Here the native monarch comes once each year, as he spends most of his time in his new palace at Rabat (see Color Plate IX and text, pages 663-4, 677, 678).

ing down from the hillside, is the Newest Fez, La Ville Nouvelle, the cluster of hotels, shops, cinemas, and habitations in the French manner that have grown up since the occupation. It is near the terminus of the railway to Tangier, to Casablanca on the Atlantic coast, and to Oujda on the Algerian frontier.

So today one can travel by train or motor car from one side to the other of France's vast North African empire that extends from the western ocean through Morocco and Algeria to far-distant Tunis.

I observe another visible sign of French dominion—the fine road on which I stand, the road that encircles the city on the slopes of the surrounding hills and gives the traveler an opportunity of viewing Fez from every point of the compass. And yet one other proof of France's rule—my very presence at this spot, alone, unarmed but safe. Formerly the Christian stranger here frequently had short shrift.

The barbaric empire, hitherto a realm of anarchy and tyranny, is at peace from the border of the Spanish Zone to the far desert, except where in the mountains of the center and to the south a few Berber tribesmen still hold out.

THEN CAME THE FRENCH, AND PEACE

Just 24 years ago Moulay Hafid was besieged in Morocco by his rebellious Berber subjects and forced to call on the French for help. On March 2, 1911, their troops entered the city of Fez (Fès), and though in the following year they were attacked and many officers were killed they have never left it.

Through the agonized years of the World War, when France was battling for her very existence, she did not relax her efforts in Morocco.

Being so recently opened to the outer world, Fez is as yet unspoilt and of deep interest to the traveler. Its size surprises. From one end to the other of the twin cities it measures four miles. Its population today is about 107,000, including fewer than 10,000 Israelites who are herded together in the Jewish quarter of Fez Djedid (see text, page 678).

The European inhabitants, to be found mostly in La Ville Nouvelle, number about

Photograph by Barceló-Bernal

RED AND GREEN BANNERS OF THE PROPHET WAVE ABOVE THE FAITHFUL

Shrouded figures are gathering at Bab Segma, one of the massive gates of Fez, for the festival of the Aisawa. Nowadays such celebrations have lost some of the frenzy of earlier years, when white-robed devotees danced for hours to the throb of drums and pipes and Christians ventured near only at their peril. The Moorish religious sect of the Aisawa was formed by a Moslem saint who lived some two hundred years ago.

9,600, principally French, with a sprinkling of Spaniards and Italians.

Of the three parts of Fez—Old, New, and Newest—unquestionably the most interesting is the first, El Bali (see illustration, page 671). To see it one must enter on foot or in the saddle, for vehicles cannot pass through its steep and narrow lanes.

From Bab Hadid (The Iron Gate) a carriage road runs inside the walls around the edge of the city to the New Gate of Bou Jeloud, where Fez Djedid touches the older town. Along it modern civilization fringes the ancient city, for it passes by the Auvert Hospital, a French post office, the British Consulate, the Bureau of Municipal Services, a military club, and a museum housed in separate parts of an old palace, the Dar Batha, and by the lovely gardens of Dar Beida, another imperial palace now used only to shelter the Resident General when he visits Fez.

None of the Arab buildings converted to modern uses has been Europeanized in outward appearance and so they do not detract from the native aspect of the city. Leaving them one plunges down steep lanes, dreary and desolate, between the blank walls of tall houses almost windowless on the street side, some as high as a five-storied London dwelling. They shut out the sky in the winding alleys.

Dismal as is their outward appearance, many are the residences of rich and noble Moors, and the interiors are light and luxurious. The privacy of their pleasant gardens is guarded by eunuchs. There the fair occupants of the harem may cast aside their veils and ugly shrouding garments, and shine in all the splendor of massive jewelry and the bright hues of silken dresses that Arab and Berber ladies wear.

WEALTH WITHIN, POVERTY WITHOUT

Seated on the ground with their backs against the walls of these houses are beggars, singly or in groups, mostly blind.

Here three men squat side by side, companions in misery. They are silent, their chins on their chests. In a sudden movement the three heads are lifted simultaneously, the haggard faces and sightless eyes upturned, three hands thrust out begging bowls, and three voices chorus in perfect time a long-drawn appeal for alms!

"In the Name of Allah, give us of your charity! You who have riches, pity the poor! You who have eyes, be merciful to the blind! God will requite ye! Alms! In the Name of the Prophet, give us alms!"

The three voices cease together, the three bowls are swiftly withdrawn, the three heads are lowered, chin to chest again—all in perfect unison. A long pause. Then together again the faces are lifted, the hands shoot forth, and the pitiful refrain rings out anew.

Farther along two old blind women sit together, but call on the passer-by independently. Beyond these a palsied man huddles, then a toothless, shriveled crone, too aged and weak to hold out her begging bowl. Verily a street of misery, though behind its blank walls riches and luxury may abound.

Down its sharp decline comes a prosperous, bearded Moor on a tall mule. He is clad in a black broadcloth burnoose over a white *gandurah* (a sleeveless garment) and sits on a ponderous saddle covered with red cloth and with silver stirrups dangling from it. Beggars shrink against the wall at his harshly uttered "*Balek!*" (Look out!).

A WATER BAG AND A BUSBY

A bell rings clear and sweet; and up the steep lane hobbles a ragged man hugging under his left arm a wet and bloated hairy thing like the swollen carcass of a drowned dog. It is a goatskin water bag with the hair left on. The bearer is selling the liquid and clangs the bright brass bell in his right hand to attract attention (see Color Plate VII).

Before the French Protectorate over Morocco was established, the British Government once sent a mission to the Sultan in Fez with letters and presents. Attached to it was a Scots Guards subaltern—he is a peer and a general today. He had visited the country on leave several times, so he was chosen to go with the mission. When it rode in state into Fez, he was mounted on a big mule and clad in the full-dress scarlet and gold of his regiment, with the bearskin—the "hairy hat," as admiring Dublin street urchins call it—on his head. Tall and handsome, he presented a striking figure in his gorgeous uniform and appealed to the crowds lining the route to the Imperial Palace.

But the bearskin busby puzzled them. "What is that he has on his head?" cried a wondering citizen in the front rank of the spectators.

Photograph by Gilbert Grosvenor

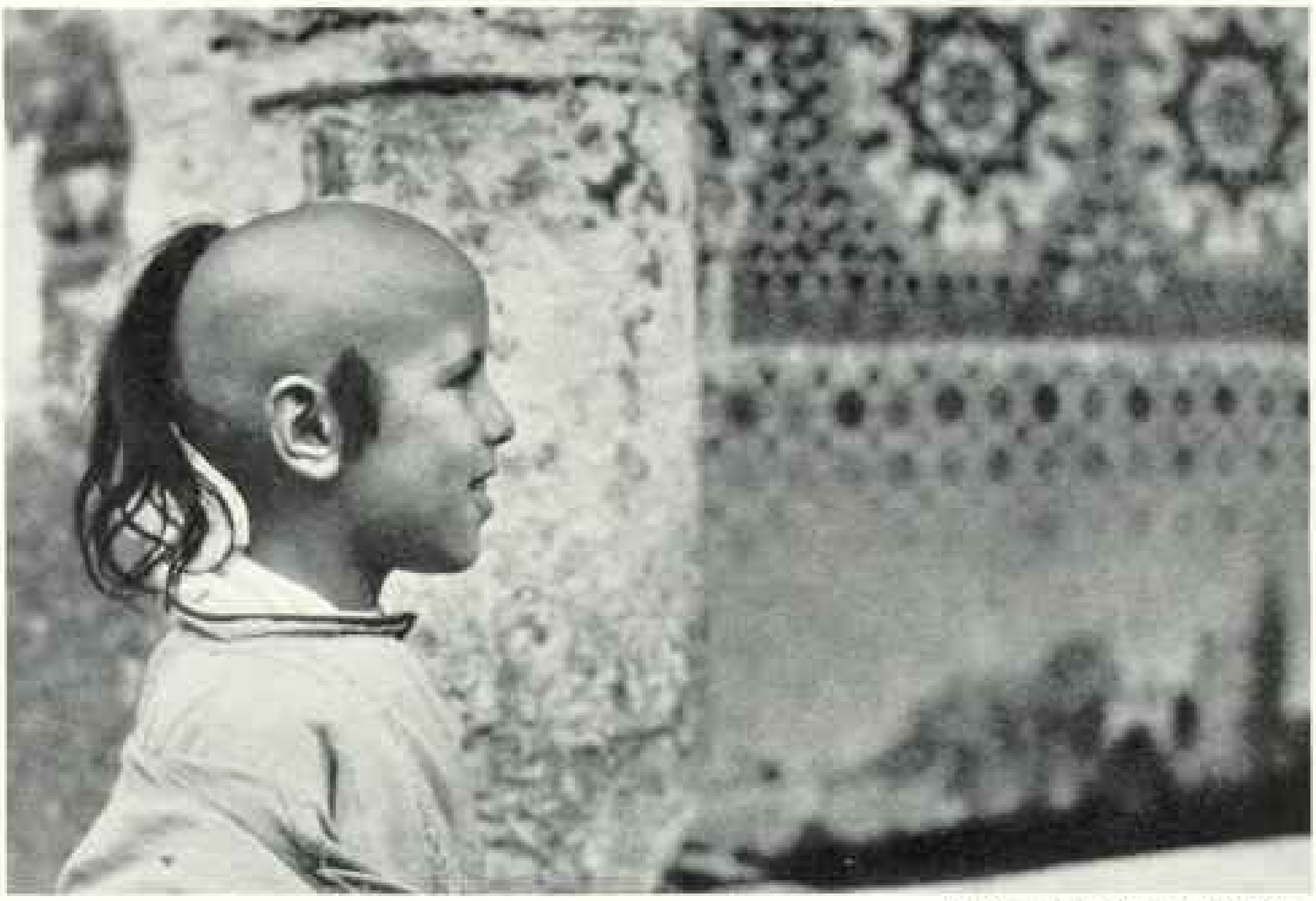
LOOKING DOWN INTO THE COURTYARD OF THE KAROUIINE MOSQUE

This is the largest and most important religious edifice in Fez (*see* text, page 675). It has 14 gates and so many columns that the Moors say a man would go mad trying to count them. In the "court of ablutions," cool fountains play, and at the prayer hour flocking worshipers lay off burnooses and babouches to wash their faces and feet. These cloistered halls are places of study, too, and in them students sometimes linger until their hair grows gray. No Christian may enter. The photograph was made from the neighboring Madrasah Attarine.

Photograph by Flandrin

A VARIED STOCK ALMOST FILLS HIS TINY STORE

Coppersmiths with clanging hammers have pounded out trays, candlesticks, dishes, and teapots, and here in one of the *souks* of Fez sits the patient Moroccan merchant who sells them. He wears a *fez*, the round red hat which bears the city's name and which was once produced here exclusively.



Photograph by Brunson De Cou

HIS TOPKNOT PROVIDES TRANSPORTATION TO PARADISE

A little Moroccan boy in the streets of Fez exemplifies the custom of shaving most of the head, but letting the hair on one small round spot grow long. By this convenient handle, tradition says, the Faithful are raised up into heaven.

A newspaper correspondent in Morocco, who was riding in the procession, had lived many years in the country and spoke Arabic fluently. He turned in his saddle and answered the enquirer loudly in the vernacular.

"That is a water bag. His Sultan has allowed him to wear it as a mark of honor for putting out a fire in his town."

And the crowd, who knew from painful experience how terrible a thing a conflagration could be among the closely packed houses of their city, nodded approvingly as they gazed at the bearskin and thought it an appropriate badge of honor.

PERFUME STREET AND TAILORS' LANE

The lane narrows into an alley barely nine feet wide, covered over with a trellis-work of long, dried reeds on which lie withering the leaves of a spreading vine which in summer gives a welcome shade.

The alley is lined with booths, for it is the beginning of the famous *souks*. *Souk* means a market; but here, as in Tunis, it designates a street of shops; and in Eastern cities the shops that sell the same things are grouped together (see illustration, page 677).

Thus the Souk El Attarine is the Street of the Perfume Sellers, who vend, besides scents, the large, brightly decorated Marabout candles to be burned before shrines. In the Souk El Khiyatine, Tailors' Street, the knights of the needle ply their trade, and burnooses, *jelabs* (short-sleeved woolen cloaks), baggy breeches, and other garments are sold.

When night comes, the shopkeepers put up and lock the shutters on their establishments. They go off to their evening meal at a native restaurant or to drink a cup of sweetened coffee at a Moorish café before returning to their sleeping mats in a room like a rabbit warren.

The Fez shop, typically oriental, usually is a square hole about three or four feet from the ground and eight feet or so high. It has no counter; for the bottom of the square hole goes back flush to the rear wall and on it the seller sits, his wares spread out before and beside him, hung around or stacked on shelves up the sides and back to the low top. Cross-legged he squats,

Photograph by Gillet-Ratel

HUGE WHEELS CARRY WATER TO THIRSTY CROPS

Mountain torrents rush through and under Fez—a strange sight in a North African country which merges into the Sahara. Wheels turned by the streams lift the water to irrigate orchard and garden.

Photograph from Gilbert Grosvenor

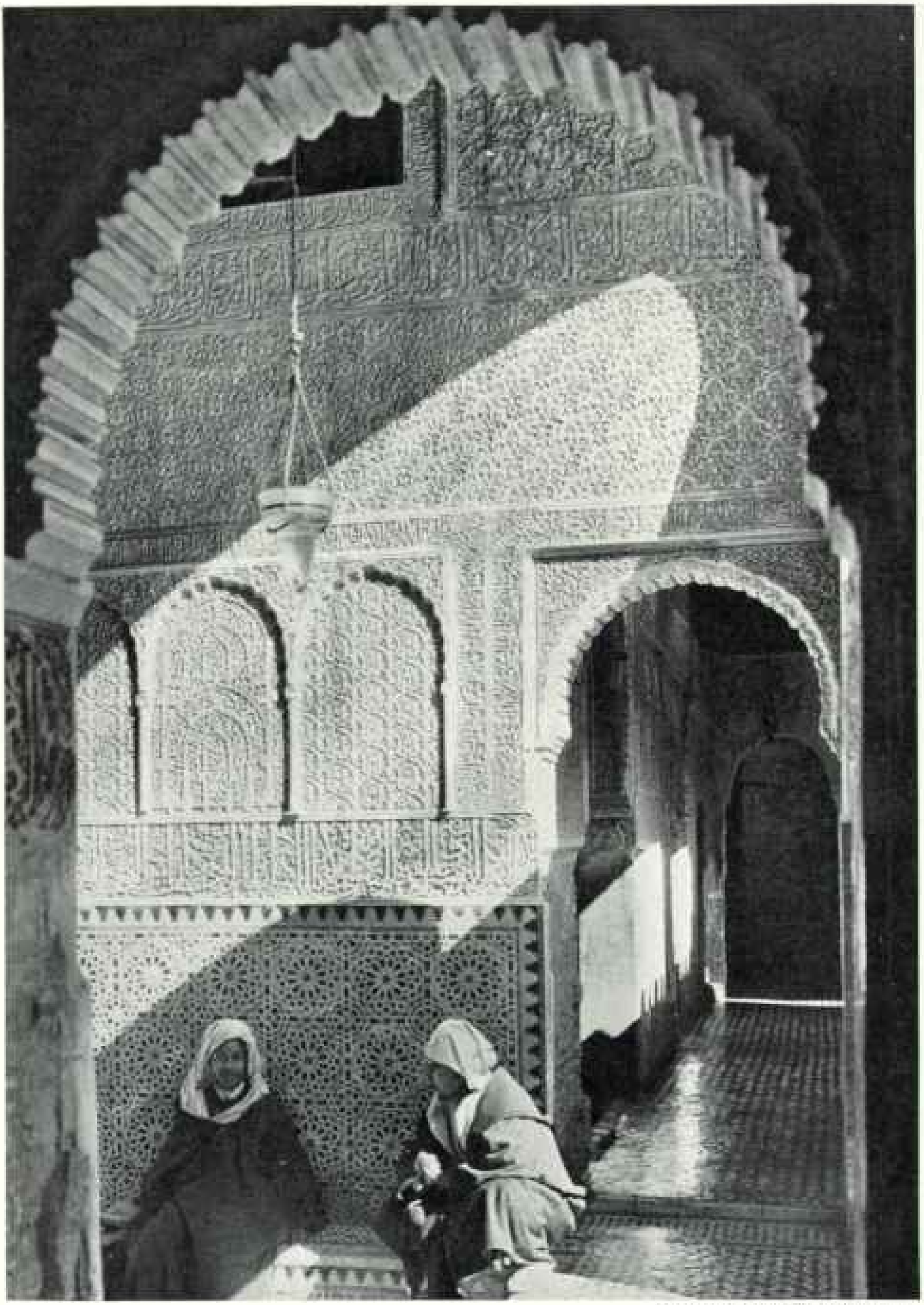
A STRANGE RELIC OF THE PAST IS THE CLOCK OF BOU INANIA

There are 13 gongs, supported on brackets, with a narrow window above each. Supposedly built about 1357 for telling time, the mechanism has been in disuse so long that no one can now explain it (see text, page 670).

Photograph by Flandrin

MODERN AIRPLANES DRONE ABOVE THE TWIN CITIES OF ANCIENT FEZ

The native city consists of Djedid, the upper town, and El Bali, the lower, older section. Fez Djedid—the name means Fez the New, although it was built more than six centuries ago—includes the Sultan's palace and the Jewish quarter. In Fez the Old are the famous mosques and theological colleges, the crowded reed-roofed *souks* (see text, pages 664, 669, and illustrations, pages 668 and 677). Still a third section is La Ville Nouvelle, a transplanted bit of modern France.



Photograph from Gilbert Grosvenor

INTRICATE DESIGNS ADORN AN OLD COLLEGE OF THE MOORS

Long before Columbus discovered America the Madrasah Bou Inania in Fez was built. The masterpiece of Moorish architecture dates from the flowering of art and learning in Morocco in the 14th century. Generations of Mohammedans have received their education within these walls, with their carved cedar panels, geometrical mosaics, and chiseled plaster.

perched like an idol, soliciting no custom and gazing vacantly at the hurrying crowd of passers-by (see illustration, page 668).

And what an interesting crowd it is! Brawny, bearded men in tattered garments, smooth-faced, effeminate students, decorous in black burnoose over white, the hoods pulled over their heads. Veiled women, voluminous in starched white coverings and bare feet thrust into gold-embroidered felt *babouches*, the heelless slippers worn by both sexes, with never a touch of other color visible about their raiment, yet glowing with brilliant hues under the outer shroud. Shaven-crowned boys, pig-tailed small girls. Cheery, grinning negroes and fair-complexioned Berbers. Porters bent double under heavy burdens, a hook-nosed Jew in black cap and gaberdine, a blind beggar feeling his way with long staff and buffeted by the careless throng.

All shuffle along noiselessly in babouches or in bare feet. Seldom is a loud word spoken as they push their way through the opposing stream, intent on their business and their goals as city men in London or New York. The hush is broken only by the ringing of the water sellers' bells or the sharp cries of "Balek!" as laden men or animals go by. Little need for the warning when a couple of donkeys bearing huge greasy cans and driven by greasier men patter along, for these are oil sellers' beasts and the pedestrians shrink aside to save their clothes.

ARABIAN NIGHTS AND CANNED FOODS

The whole is a scene from the Arabian Nights' Entertainments. Were Harun-al-Rashid set down in the souks of Fez, nothing in them would seem strange to him except the stacks of Swedish matches and canned provisions set out in the shops, and the magic lamps that at a touch shine out in the narrow lanes more brilliantly than all the candles in his palace. For throughout Fez there is electric light, even in these booths!

In 1920 a power station was installed just outside the city. Utilizing the water of a stream, it supplies light for about twenty miles around and furnishes power to several factories in or near the town. The most incongruous thing in Fez!

I have seen the narrow lanes of Canton and the broad streets of Peiping, the bazaars of Cairo and Stamboul, the climbing alleys of Algiers and the vaulted souks of Tunis, but Fez El Bali, so near the Atlantic Ocean, seems to me the most oriental city of them all. You still may wander about its labyrinths some days without meeting a white man. No; I am wrong to use the adjective "white," because most of the Moors, especially those of pure Berber stock, or as pure as can be found today, are white—fairer skinned by far than southern Europeans, than many Frenchmen or Englishmen.

So rare was it even a few years ago to see any but Moor, Jew, or Negro in these crowded souks that it was a surprise to discover a French officer in blue or khaki seated cross-legged in a shop bargaining with the owner for a beautiful leather book cover stamped in gold, or an exquisite bit of old embroidery. And, stranger still, to behold a well-dressed European girl standing before a silk merchant's booth calmly feeling between finger and thumb a length of shining material. For she was alone in the heart of this strange city. And the sight of her, safe though solitary, was an eloquent testimony to French rule. But now the sight-seers begin to come.

Alien women now wander safely through the dim and crowded alleys of Fez, where, two dozen years ago, France's sons—officers, soldiers, and civilians—were cruelly massacred. Yet this change has been achieved without harshness or injustice to the native inhabitants. Their prejudices are deferred to, their religion and customs not interfered with. No Christians may enter their mosques. No sight-seeing European is now allowed to visit their beautiful theological colleges, by the Resident General's orders, because of some visitors' irreverent behavior.

QUAINT WARES IN PIGEONHOLE BOOTHS

There are the shops of the sellers of gold-embroidered belts for women—beautiful girdles, two or three inches broad, of padded velvet heavily worked in gold wire. There are the venders of leather articles—large, square, red bags with rings by which they are slung like satchels over the shoulders; long fringed bags stamped in quaint designs or worked with colored thread; purses, notecases, triple-folding and adorned with cut-out designs on a colored background. Most of these leather articles smell like polecats!

In the Street of the Slipper Sellers are stacked columns of heelless babouches, some with fronts beautifully ornamented with

Photograph from Gilbert Grosvenor

ONE OF THE FAITHFUL DROPS A COIN INTO THE POOR BOX OF MOULAY IDRIS

Countless worshiping lips and hands have left their marks upon the shrines and fountains set in the walls of this venerated mosque. It is sacred to Moulay Idris the Younger, who conquered a Berber encampment, founded Fez on the site, and thus laid the foundations of the Moroccan Empire.

gold, silver, or silk embroidery; others just plain yellow leather down-at-heel slippers. This Eastern footgear is so speedily worn out that the trade in it should be lucrative. You may chance upon a wild rush of men crowding about some shops, clamorous and holding out eager hands to snatch at long lengths of babouches thrust one within another. Then you will see them scurrying from these wholesale establishments, for such these booths are, to the shops of the retail merchants.

One rushes up to the grave, bearded vender sitting cross-legged on his counter-shop floor, and thrusts a yard of yellow slippers at him. The retail man looks at them languidly, shakes his head, and the middleman hurries on to the next, to be succeeded by another and another until the squatting figure in the square pigeonhole makes his purchase to replenish his stock.

Such a scene, and an excited mob of women at an open-air auction of wool mattresses screaming out offers, are the two most animated glimpses of native life that the souks can give.

The Street of the Coppersmiths resounds with the musical clang of their hammers on the rounded pots. The Street of the Silk Sellers glows with color. The Street of the Brass Workers shines with the golden brightness of the artistically shaped vessels, huge kettles, the stemmed banqueting dishes with their tall conical covers, and the hanging lamps with colored glass sides.

Then there is the Street of the Dyers. Half-naked figures, faces, arms, and bodies stained all colors, stir big earthenware pots of bright-hued liquids, dip into them or haul out cloths, masses of silk thread, or lengths of flimsy material.

HOME-MADE BREAD COOKED AT BAKERY

A small girl pushes by you, bearing on her head a flat board containing flattened lumps of dough, and dives into a dark cellar doorway. Another emerges with flat crusty loaves spread on the wooden tray on her head. The Moorish housewife makes her bread at home, but sends it to the baker to be baked.

The camera rarely can help the pen in depicting the quaint native life in the souks, so gloomy are they under the shading mattings overhead, so incessant the coming and going of the passing throngs that will not halt their hurrying steps. The photographer risks being knocked over by a big mule with a careless rider or barged into by sharp-edged wooden cases borne by quick-pattering donkeys.

There are things of greater moment in Fez than the varied crowds and the fascinating souks. A sudden turn in a narrow covered lane, and you see a wide-open arched door that gives a view into a marvelous mosque, the Karouiine. A vestibule glowing with bright-tiled walls and floor, a broad, central, tiled court, a graceful fountain spouting water, a forest of carved pillars—I counted 270 of them—with their long vistas showing masses of white and black.

There white-robed men kneel, swaying forward and back together, bending until their foreheads touch the tiled pavement, rising to their feet, bowing, sinking to their knees again, prostrating themselves with faces to the ground—all in perfect unison. And never a sound! Picture the scene on a Friday when fifteen or twenty thousand Moslem men fill this great mosque.

Photograph by Gordon Casserly

WEARY TRAVELERS FIND REST AND WATER AT A FEZ HOSTELRY

The gateway leads to the Nejjarine Fonduk, or inn, from which some of the romance of other days has vanished (*see* text, page 676). Rich blues and greens glitter in the mosaics of the fountain, with its hanging lamp of brass and colored glass.

WOMEN WAIT OUTSIDE THE MOSQUE

Women are not admitted, except into a corner of it. But you will see them come to the gateways—there are fourteen of these—and, putting their heads timidly just inside, kiss the lintels of the open doors.

The Karouiine mosque was begun in the 9th century and finished in the 11th; but successive sultans further embellished it. One of its gates, covered with bronze ornaments, dates from 1136. Besides serving as a place of worship, it is the seat of the Fez Mohammedan University, to which hundreds of students from all parts of Morocco flock to study theology, grammar, Moslem law and jurisprudence from its renowned professors.

There are many other mosques in Fez El Bali, but none can compare with this, the largest in Africa.

Madrasahs, ecclesiastical colleges, and *Zaouias*, seats of religious confraternities,

abound. The former are generally housed in beautiful buildings. The bronze gates and the tiled halls and courts are all that can be seen by the Infidel now, unless he be highly favored. The most important is the Madrasah Bou Inania, erected in the middle of the 14th century, a college and a mosque in one, beautified with worked bronze, porcelain tiles, carved wood, onyx and rose and white marbles.

Even lovelier is the Madrasah Attarine in the quarter of the Perfume Sellers, with its ornamental vestibule, its gates of chiseled bronze, its sculptured marble columns, and its arches of carved wood. Near it is the Zaouia of Sidi Ahmed Et Tidjani, a brotherhood founded by the Moslem saint of this name in Algeria in 1781.

This religious order was forced by the enmity of the patriot Abd El Kader into close sympathy with the French, a sympathy which endures to this day. The friendship or hostility of these confraternities and of the ecclesiastical colleges to which students come from all parts of Morocco is here, as in all Islamic countries, a matter of moment to the rulers, especially if they be foreigners. The French have established, and wisely so, a Mussulman college (in Fez Djedid), at which the male native youth of Fez may complete their education in Arabic and French studies under Mohammedan and French professors.

COURTYARD "LOBBIES," SPECIALTY SHOPS, BUT NO FOOD, AT "HOTELS"

The many *fonduks* dotted about the capital, like the caravansaries of farther East, are the oriental equivalents of our hotels. Many are architecturally fine and date back hundreds of years.

We enter one through a massive gateway leading into a square courtyard surrounded by two- or three-storied buildings. On the ground floor are lock-up shops in which the traveling merchant can display and sell the goods he has brought, perhaps from distant lands. Carved wood galleries run round the upper stories and off them open rooms in which the wayfarer can lodge until he has sold off his stock or finished his business and is ready for the road again. No food is supplied. There are just the bare chamber and the shop. In all other things the lodger must fend for himself.

In the courtyard of one of these fonduks, where weary burnoosed men dismounted from red-saddled mules and tired horses, I saw several long-bearded, black-gaberdined Jews opening wooden packing-cases painted with the name of a Belgian firm and with English words "Stow away from the boilers" stenciled on them.

Oh, for the vanished romance of caravans from the far desert with dromedary loads of ivory, ostrich feathers, and gold dust!

The common fonduk has stables on the ground floor or else the travelers' horses, mules, camels, and donkeys are picketed round the court, making the place noisome with stench.

A curious relic of the past is to be seen on the front of one of the houses in the grouped buildings of Bou Inania, in the Tala Souk, facing the famous madrasah. From the ornamented plaster and wood façade jut out thirteen carved wooden beams; on the end of each rests a large green bronze flattened bowl or gong. Above each is a narrow window in alignment. All these are supposed to have formed part of a timepiece constructed in 1357 and are called in consequence "the Clock of Bou Inania" (see illustration, page 670).

A BRIDGE OF SHOPS

Through Fez El Bali rushes tumultuously the little River Fez. You will cross it over one bridge in the heart of the city without noticing it; for the bridge is lined with shops and seems just part of an ordinary souk. For a space the stream runs swift in a deep chasm of blank-walled houses. From the garden of one a solitary date palm rises, sharply outlined against the sky.

The city seems well supplied with water, which rushes noisily underground down the steep slopes; and you wonder how the water carriers do such good trade with their skin bags and the two bright brass cups linked by a chain to their bells. For all day long you see them giving drink to the pigeon-hole shopkeepers and the passers-by.

In a little recess in the wall beside the door of a dentist's house (you cannot fail to recognize the abode of an Arab tooth-drawer, for he displays a small glass case filled with molars and grinders that he has pulled) a column of clear water bubbles up fiercely like a geyser. It gushes out of the spouts of the tiled wall fountains; sparkling jets shoot up in the marble basins in the courts of the mosques; it flows freely into the rectangular stone baths at the doors of the sacred buildings where the Faithful perform their ablutions before entering to pray.

Photograph by Branson De Cou

A LATTICE OF REEDS GIVES WELCOME SHADE IN THE SHOPS

Dim and mysterious are the native markets of Fez, with their varied sights and smells. In these tiny *souks* the merchants sit, surveying the crowd with vacant gaze (see text, page 669).

Many of the wall fountains in the city are beautifully designed and ornamented with colored enameled tiles and carved wooden overhead shelters from which, by long chains, lovely brass lamps with pierced sides and colored glass hang above the basins into which the water spouts. Of these the most charming is the Nejjarine beside the "hotel" of the same name (see Color Plate VI and illustration, page 675).

THE WHITE HOUSE OF OLD FEZ

Fez, so long the capital, the Imperial City, has its palaces, of course. The Dar Beida (White House) was erected by Moulay El Hassan at the end of the 19th century and enlarged at the beginning of the 20th by the spendthrift Moulay Hafid. It shelters the French Resident General on his visits to Fez. Its separate buildings are surrounded by large and beautiful gardens.

Near it is the Dar Batha, another palace built in comparatively recent years by two sultans and now turned to other uses; for part houses a military club and part a museum, with valuable collections of examples of ancient Moorish art in pottery, embroidery, weaving, carving, and jewelry. There are armor and weapons, old and new; and on the tiled terrace in front overlooking the gardens are antique cannons.

One room is devoted to a collection of Imperial souvenirs, among which is a significant and characteristic one—a cage about four feet high and square with stout iron bars. In it the Sultan Moulay Hafid imprisoned for months the Pretender Bou Hamara (who had fought against His Majesty and in 1904 against the French in Algeria), finally throwing him to be eaten alive by the lions in the menagerie of the Imperial Palace of Dar El Makhzen.

For even in these enlightened days—Moulay Hafid was the monarch who in 1912 signed the convention which recognized France's protectorate over Morocco—the Arab does not err on the side of tenderness. In Fez El Bali is the madhouse where the poor lunatics were confined in their cells by chains to iron rings round their necks.

The Dar El Makhzen is a palace indeed, which the present Sultan visits every year. It covers some 200 acres of ground and encloses within its lofty walls the imperial abode, an ecclesiastical college, a library of rare books, large gardens, and wide tiled courts and a pond. It shelters a number of more or less aged ladies connected with past sultans, who were fairly numerous in recent years, the late monarch having been the brother of his two predecessors.

Although Fez Djedid holds the only Imperial Palace in use today, the Dar El Makhzen, it is a less fashionable quarter (from the native point of view), meaner built, smaller and much less interesting than Fez El Bali. A great deal of it is occupied by the Mellah, or ghetto of the Jews, who were turned out of the older city in the 14th century and forced to reside here. The Mellah contains seventeen synagogues, a large cemetery, and an Israelite dispensary.

Some Jews, as in Algeria, adopt European dress; others are clad in the garb worn through the centuries by their forbears. The men's costume consists of a black burnoose over white and a black skullcap or a black *chéchia* with tassel. The women wear a shaped dress fitting into the waist, down to which it is buttoned, with an embroidered white muslin overdress of a Magyar bodice and four loose panels forming an overskirt. On their heads they wear black or brightly colored thin-fringed shawls, swathed tightly over the crown and falling down the back (see Color Plate III).

The children take advantage of the education now offered them which was denied to their elders; and at noon the lanes and alleyways of the Mellah are thronged with swarms of them attired in the old costume or in knickerbockers and in short skirts and long stockings rushing home from school for the midday meal (see Color Plate VIII).

The adults sit cross-legged in their pigeonhole booths, selling jewelry, or engage in tailoring, shoemaking, squatting at street corners cobbling old boots, or walk briskly up and down, offering cheap native ornaments or babouches for sale, or beg from door to door. Living all these centuries herded together, never marrying out of their own community, they might be brothers and sisters of one big family.

The one street of Fez Djedid ends in a wide open space, surrounded by old city walls, which is called The Place du Commerce. Here are a French bank, a couple of French cafés, a small cinema, and offices for booking passages in the motorcars, autocars, and autobusses that mass here prior to setting out for places off the railroad lines and many neighboring towns.

TOUCHES OF MODERN LIFE

Here is modern life. Europeans sit at the little tables in front of a hotel and a café and watch the small Arab and Negro boys making frenzied rushes at the newcomers descending from the various motor vehicles, grabbing the luggage and fighting savagely with each other for the chance of earning a few coppers. Other urchins dart about with boot-cleaning boxes under their arms with shrill cries of *"Cireur!"* (Shiner) to everyone who wears boots.

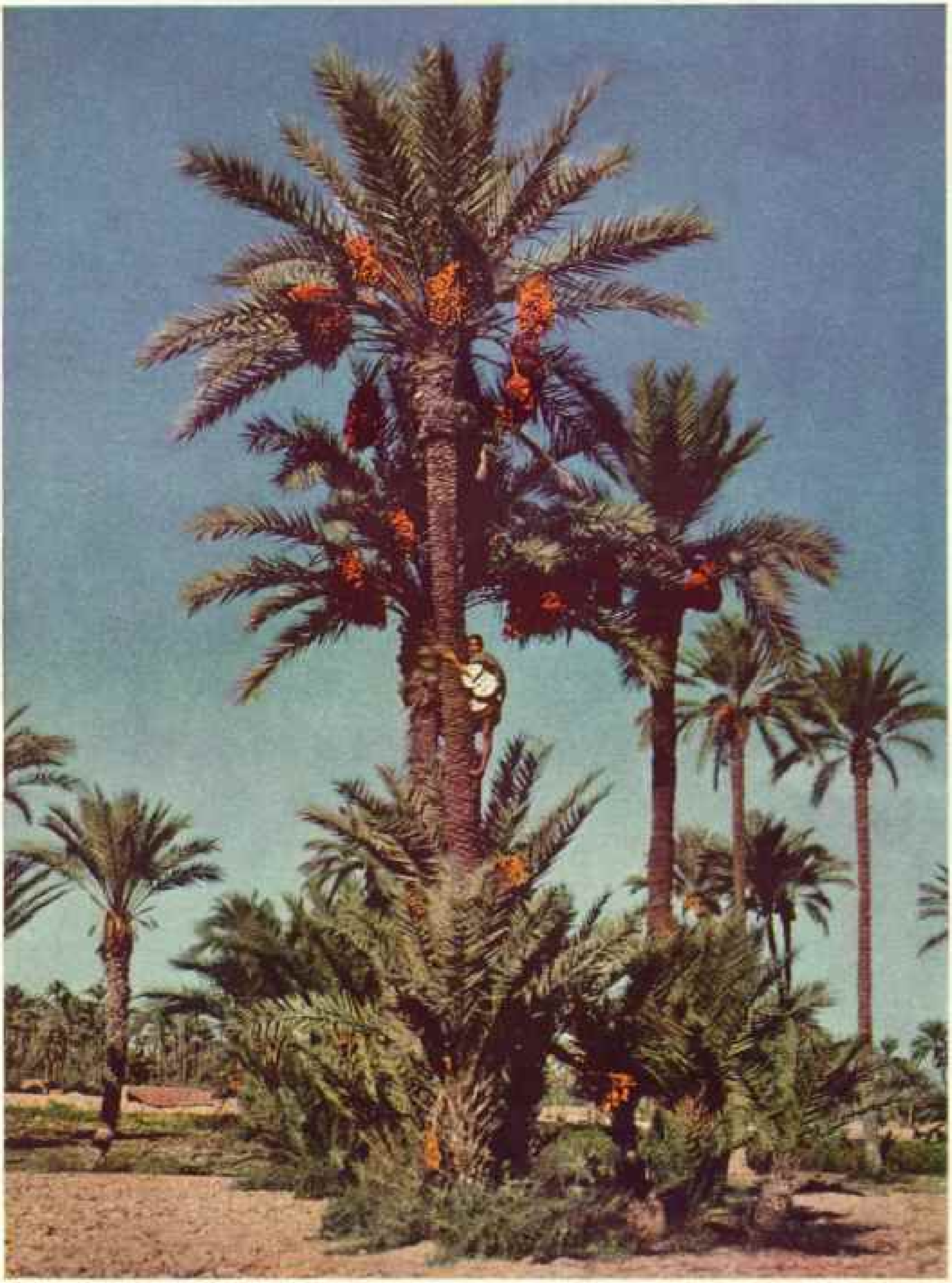
A long line of pair-horsed victorias await hire. French officers trot by on well-groomed steeds, followed by native orderlies. Wealthy Arabs on fine mules, poor ones on galled donkeys, veiled women on foot, pass by the single white policeman on duty on their way in or out of the big sentry-guarded gateway, the Bab Lamer, where ends the city and begins the short road to La Ville Nouvelle.

When I first saw Fez, nine years after the French had marched in, I motored from Algeria with difficulty over rough mountain tracks. Behind mine came a second automobile; but in the rocky defiles it was overturned and two of its occupants, a Frenchman and his wife, were killed.

When at last my own automobile reached what was called a road, it all but skidded over a thousand-foot precipice and then broke down for good in a region overrun by rebel tribesmen. I had to ride all night, standing in a lorry, through a terrible storm that probably saved our lives by keeping all cutthroats sheltered in their caves and camel-hair tents.

Times have changed. Today over a broad-gauge railroad a train of luxurious cars brings travelers from Tangier to Fez. And the line goes on to Oujda, on the Algerian frontier, to link up with the railroad to Algiers and on to Tunis.

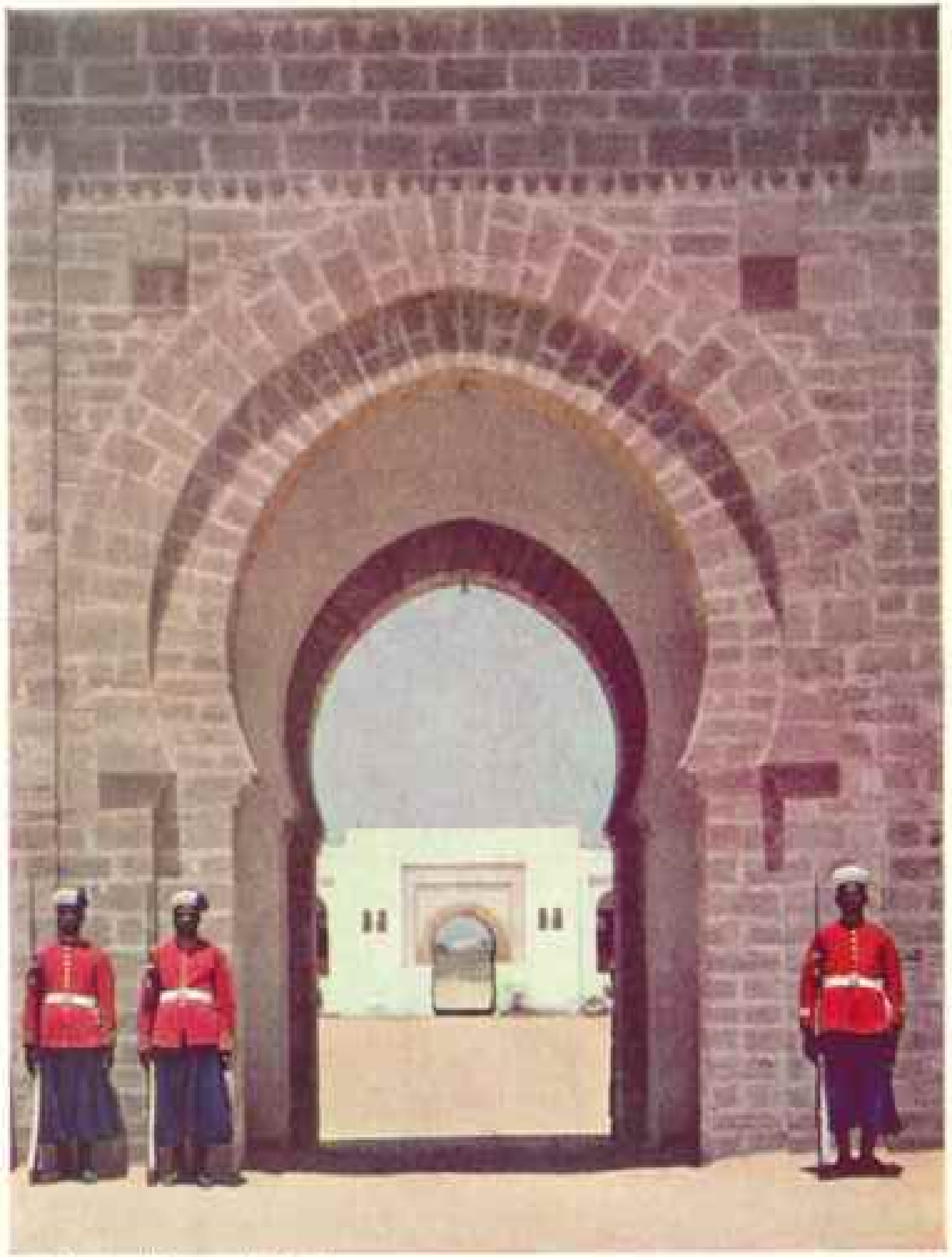
Thus I now can step into a sleeping car in Paris, change to a steamer at Algeciras for the short crossing of the Strait of Gibraltar, and again to the train at Tangier, traveling in comfort from the Capital of the French Republic to that of the Sherifian Empire, and turning back the clock of time to 500 years ago.



 Autochrome Lumière by M. Flandrin

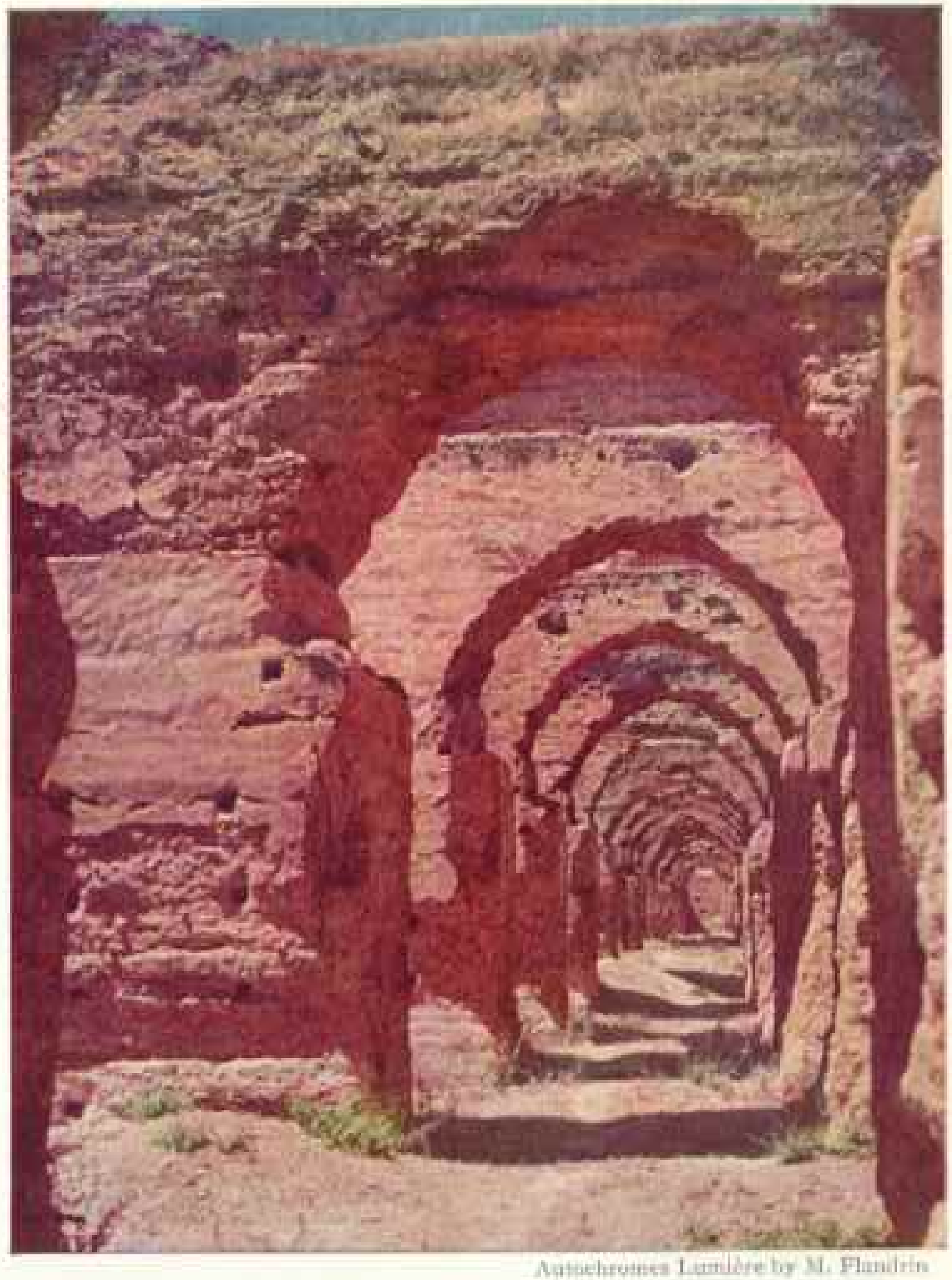
LEGEND SAYS A BESIEGING HOST BROUGHT DATE PALMS TO MARRAKECH

Wild riders of the Sahara under the first Filali sultan pitched their hostile camp around the city's walls. From the seeds of the dates the invaders ate, the Moors say, sprang the oasis city's girdle of a hundred thousand palm trees, "their feet in water and their heads in fire." Here at harvest time a boy runs nimbly up the trunk to cut off the clusters of red-gold fruit (see Color Plate IX).



BAYONETS GUARD THE SULTAN'S PALACE

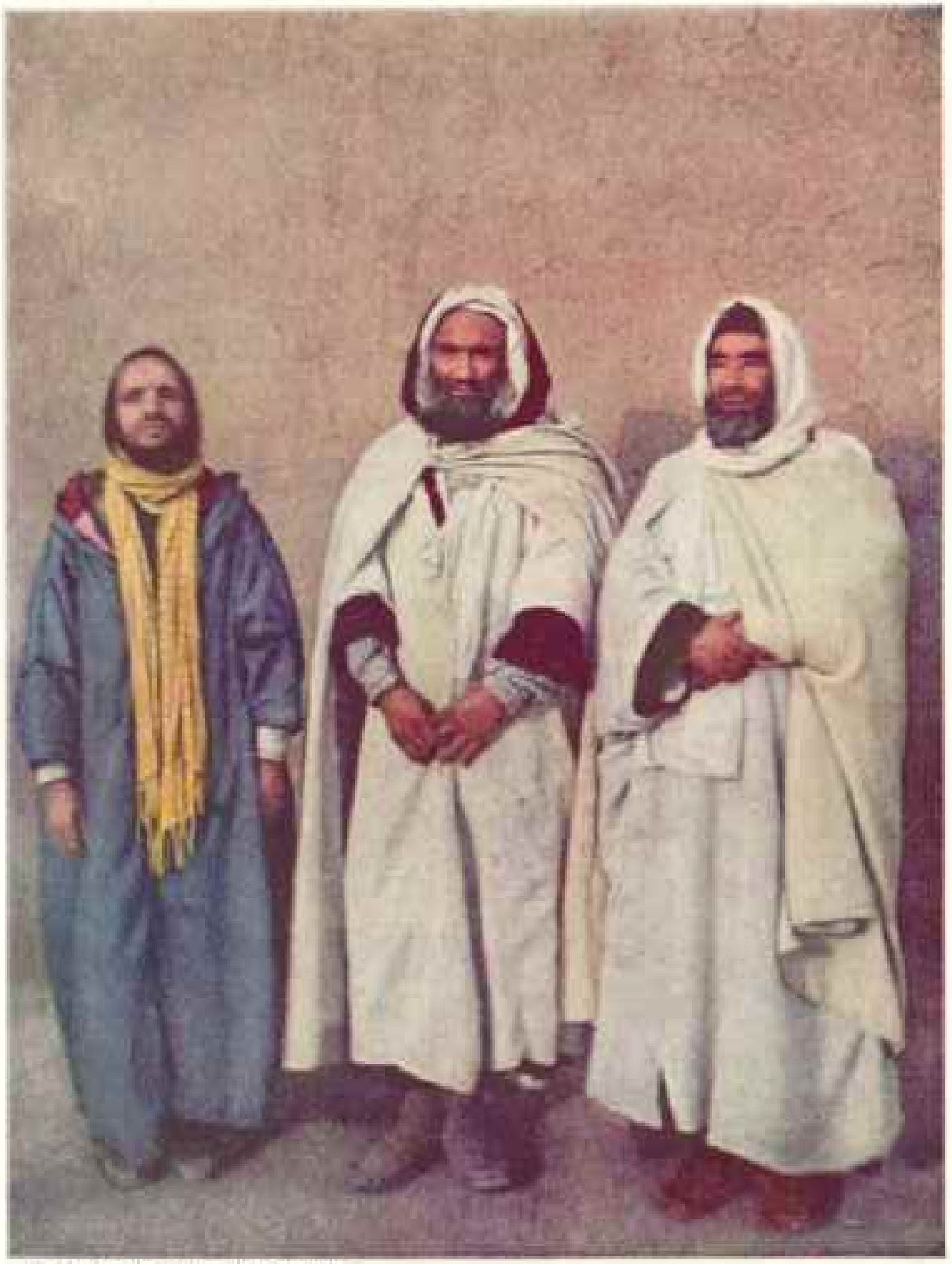
The native monarch dwells at Rabat, surrounded by his Black Guard, but the French Resident General wields the power (see Color Plate IX).



Autochromes Lumière by M. Flandrin

HERE A CONQUEROR KEPT HIS 12,000 HORSES AND MULES

At Meknès stand the ruined stables of Sultan Moulay Ismail the Bloodthirsty, who flourished more than two centuries ago (Plates X and XI).



JEWS NOWADAYS MAY WEAR THE ARAB'S FLOWING BURNOOSE

Until recent years strict regulations required them to dress in black gaberdine, to stay in their ghettos, or *mellahs*, and not to ride a horse or look a Moslem in the face. This trio dwells at Erfoud in the Tafilalet region.

Autochromes Lumière by M. Flandrin

A DARK-EYED REBECCA OF ERFOUD DONS SABBATH FINERY

Though this Jewish woman drapes herself with yards of fine cloth, she does not veil her face as the Moslems do. She wears a voluminous flowered skirt, a mantle which nearly touches the ground, and huge hoop earrings (see Color Plate VIII).

WHAT TALES OF SLAUGHTER THESE OLD PORTUGUESE GUNS COULD TELL!
Relics of the days when the hosts of Barbary challenged Europe and harried the Mediterranean, these bronze pieces now lie forgotten in the section of Rabat dominated by the ancient fortress of the Oudaiya.

© National Geographic Society Autochromes Lumière by M. Flandrin

NATIVE GIRLS OF FEDALA POSE UNVEILED

But the habits of centuries generally prevail among the Moors, and feminine faces are rarely revealed outside the women's quarters. The features of this group bespeak the admixture of races in North Africa, which has known the Arab, Berber, Jew, and Negro; the Carthaginian and Roman.

WHITE-DOMED TOMBS OF MOSLEM SAINTS SLEEP IN THE AFRICAN SUN
To such shrines at Safi devout Moslems come, knock three times to awaken the sleeping holy man, and pray for love, for revenge, for children, or for deliverance from spells.

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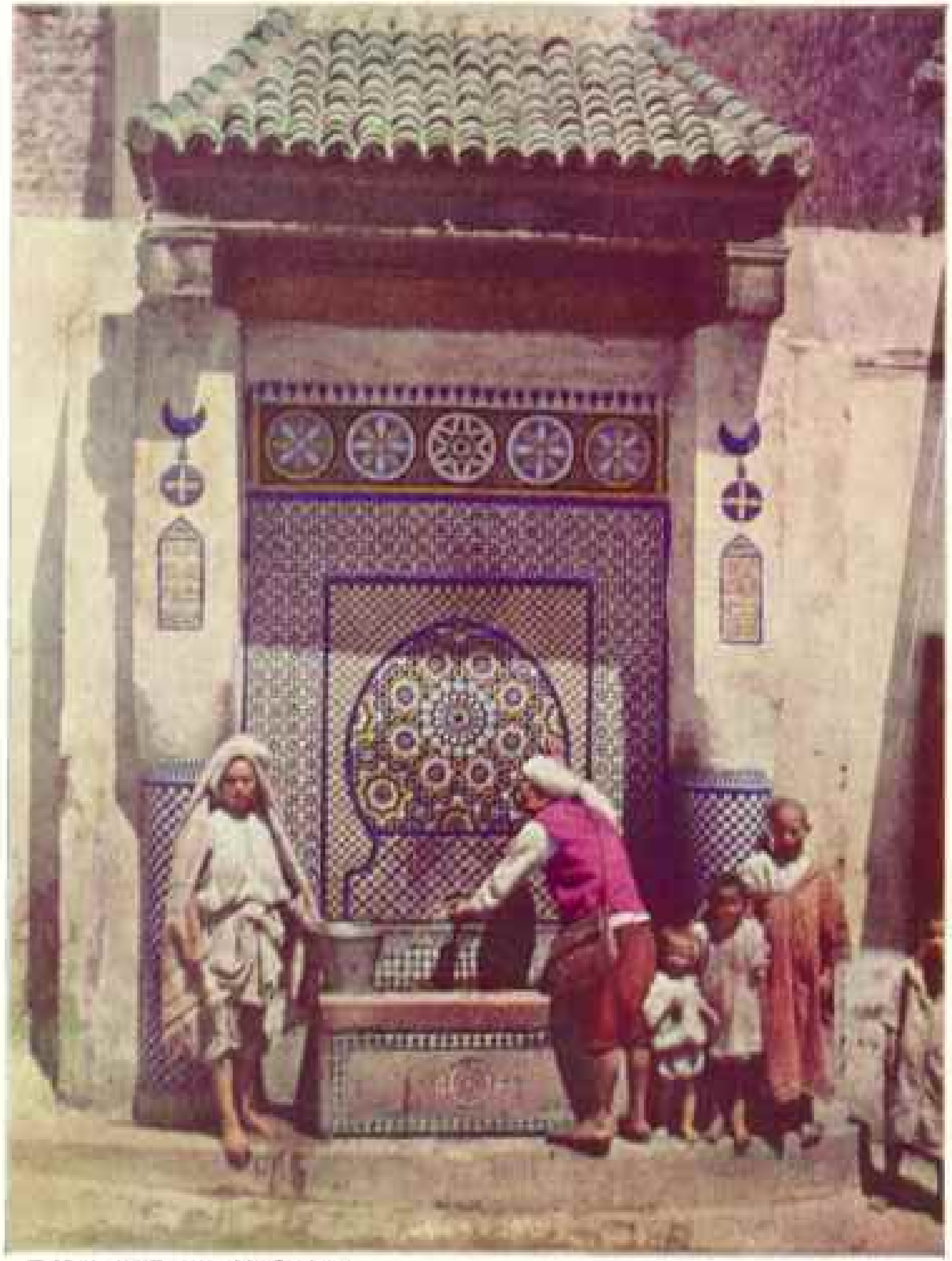
WITH HIS HAND-MADE BROOM HE SHOOS AWAY THE FLIES

While waiting for customers, merchants squat thus, or sit cross-legged in the market of Marrakech. "In season" are sold squashes, turnips, carrots, and bright-red peppers. Through the markets swirls the colorful life of Moroccan cities, enlivened by snake charmers, dancers, and story tellers.



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PRECIOUS WATER GUSHES FROM A WALL OF RICH MOSAIC

Intricate geometric designs and the crescent of Islam decorate the public drinking fountain and well at Sefrou, near Fez. Thither comes a constant procession to quench their thirst or fill their pails.

Autochromes Lumière by M. Flandrin

MOROCCANS KNOCK DOWN RIPE OLIVES WITH LONG POLES

Around Marrakech are some of the most luxuriant olive groves in the world. Irrigation has increased production here and elsewhere in Morocco. Previously the country imported olive oil.

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A RINGING BELL HERALDS THE WATER VENDER

Through the streets of Fez he goes, hugging under his arm his wet water bag of goatskin with the hair left on. In one hand he carries his bell; in the other his cups or bowls. Behind him plashes a fountain in a bowl carved from a rock 2,000 years ago.

Autochromes Lumière by M. Flandrin

YOUNG ARAB GIRLS WEAVE RUGS OF VIVID HUES

Busily their fingers fly over the warp and woof on a crude old loom, while a pot of Morocco's sweet tea brews at their elbow. The rugs are colorful, though some are a little coarse. Many weavers still use vegetable dyes.

RAGGED JEWISH URCHINS OF ERFOUD WEAR BIG SHINY EARRINGS

Far down on the fringe of Sahara they dwell. Only in recent years has France pushed its control to this remote Tafilalet section, with the aid of the famous Foreign Legion (see Plate III).

© National Geographic Society Autochromes Lumière by M. Flandrin

AGE-OLD ARTS OF EMBROIDERY ARE TAUGHT IN A MOSLEM SCHOOL

Each locality has its characteristic design, painstakingly wrought on wool cloth. With their work spread over a low, cotlike frame, small girls follow the complicated pattern of a special type made at Sefrou.

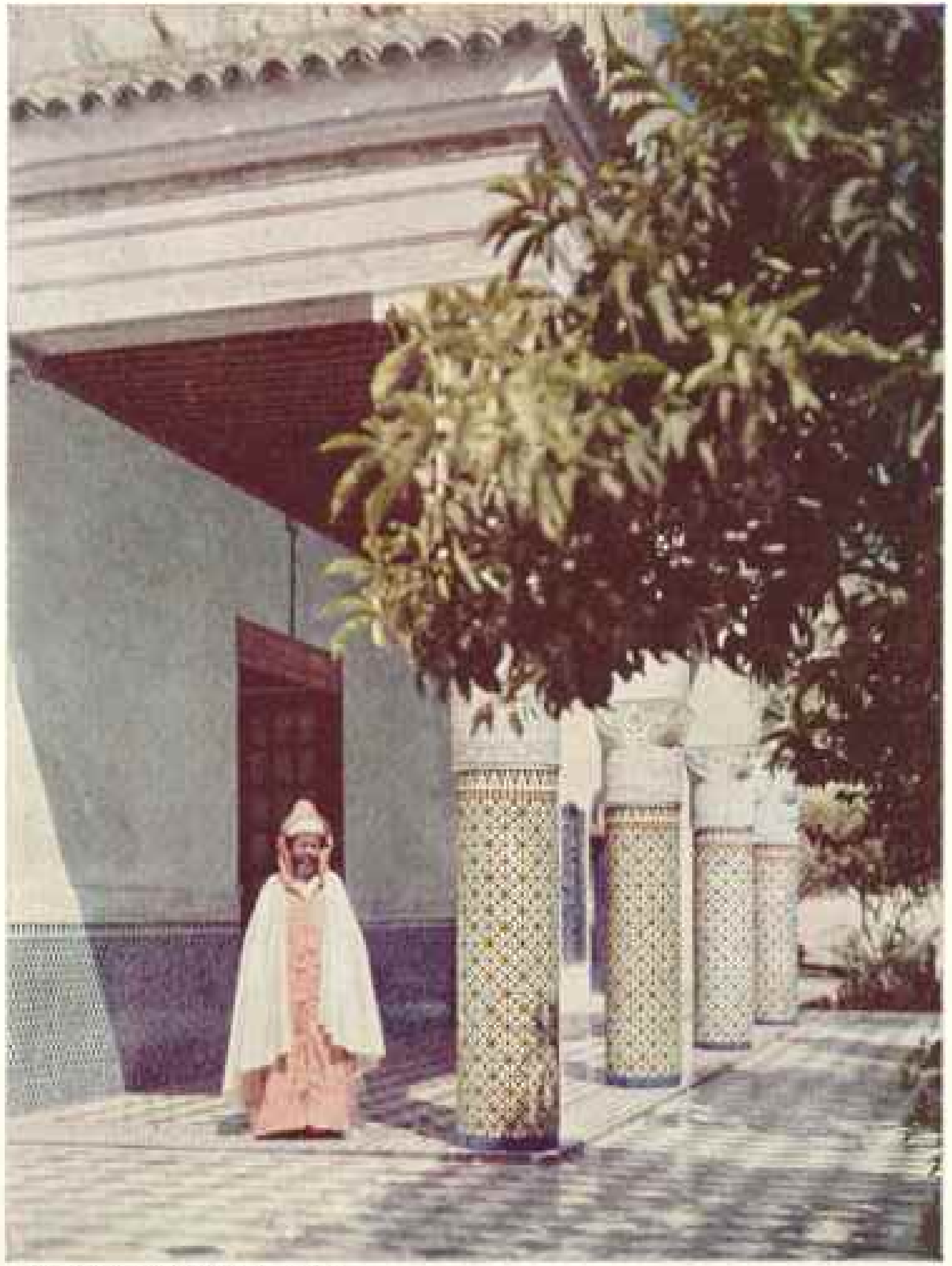
THE SULTAN NOW LIVES IN THIS NEW MOORISH PALACE AT RABAT

Theoretically he is an absolute monarch, but actually his empire is divided into three zones, one under French authority, another under the Spanish, and the third international. He dwells in the French Zone, usually at Rabat, but occasionally at Fez, Marrakech, or Meknes.

 Autochromes Lumière by M. Flandrin

"HONOR THE DATE PALM, FOR SHE IS YOUR MOTHER"

So said the Prophet. And to millions in North Africa the nourishing fruit is bread and meat. Some of these women date venders from the desert near Marrakech are scrupulous about covering their faces; others neglect that formality (see Plate I).



HIS ANCESTOR MADE ALL MOROCCO TREMBLE

The Sherif Moulay-Kebir Ben Zidane, posing in the patio of his palace in Meknès, traces descent from the mighty Sultan Moulay Ismail.

Autochromes Lumière by M. Flandrin

AN ANCIENT ISLAMIC COLLEGE LOOKS OUT TO SEA

In the Kasba Oudaiya at Rabat rise the vine-grown walls of the old naval academy of the Barbary pirates.

Autochrome Lumière by M. Flandrin

A CHRISTIAN SLAVE WAS THE ARCHITECT OF THE MONUMENTAL BAB MANSOUR

The gate was begun in the reign of the ruthless Sultan Moulay Ismail, who lopped off the heads of his servitors to test the edge of his swords, had a harem rivaling that of Solomon, and begot literally hundreds of offspring (see Color Plates II and X). The massive structure with its marble columns and colored tiles was completed by a ruler who described himself, by contrast, as "The Asylum of the Weak and the Providence of the Needy; the King who is obeyed from Love and Respect."

Autochrome Lumière by M. Flandrin

BEYOND CRUMBLING WALLS AND VERDURE GLEAMS THE WHITE CITY OF FEZ

It nestles in a pocket among high hills, some covered by luxurious olive groves. To the traveler on the heights comes faintly the murmuring voice of the city, glamorous as the Arabian Nights.

Autochrome Lumière by M. Flandrin

THEIR FACES MIRROR THE MINGLING OF RACES IN THIS ANCIENT LAND OF THE MOORS

For hours they sit and sing their lessons, reciting the Koran until they have learned it by heart. Such a group of serious-faced girls and boys, seen in Sefrou, personifies the Young Morocco of the twentieth century.

Autochrome Lumière by M. Mandrin

AFRICAN SUNLIGHT FLAMES ON BATTLEMENTS AND TOWERS ABOVE THE VALLEY OF THE ZIZ

In fortified villages and frowning citadels dwell powerful chieftains and hereditary saints who lead the fierce men of the desert in paths of peace or war. Walls and houses rise, tier on tier, above the fronds of palm trees fringing the rocky stream which eventually dies out entirely in the broad, hot bosom of the Sahara south of the Grand Atlas.

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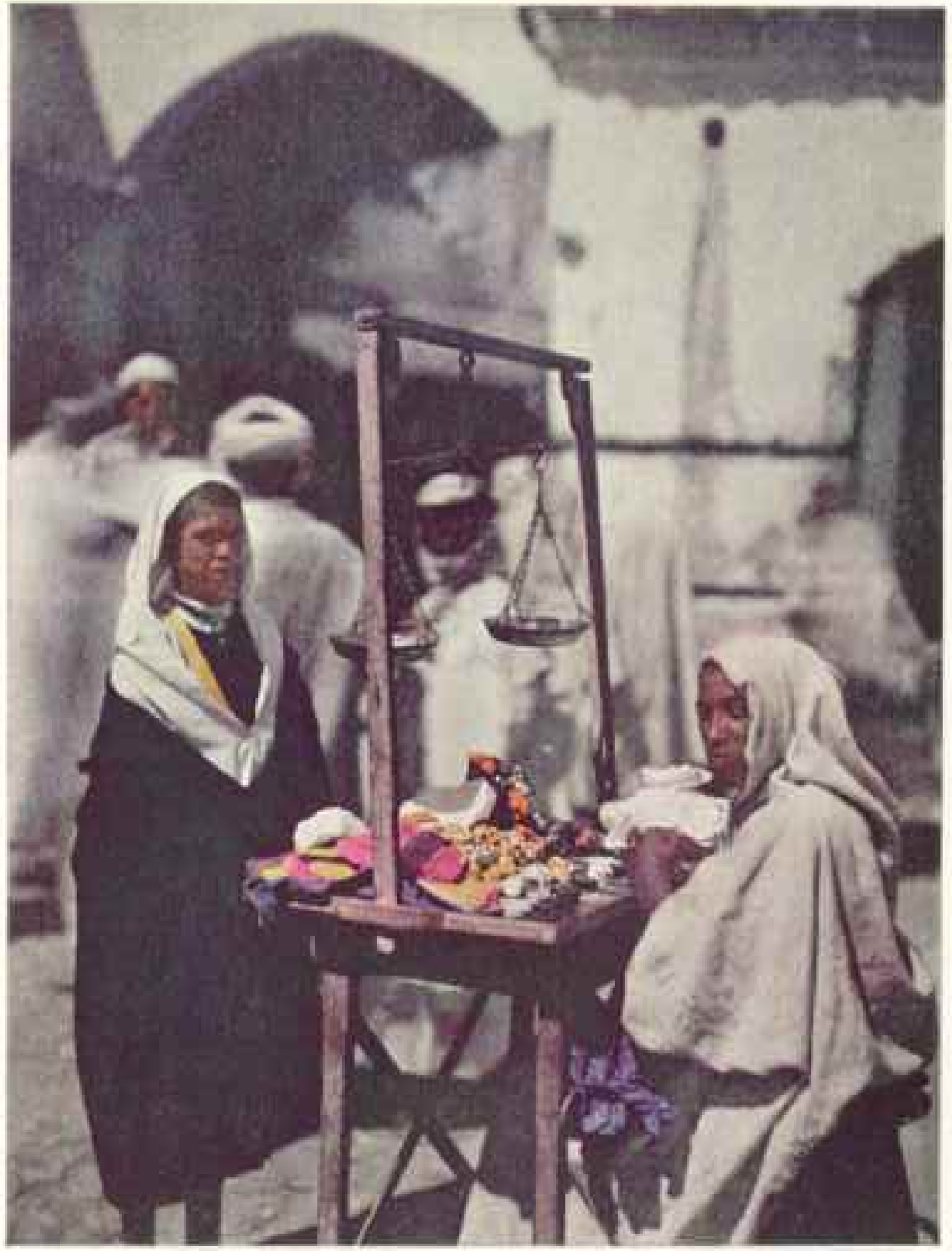
WHAT THE WELL-DRESSED YOUNG MOSLEM WEARS

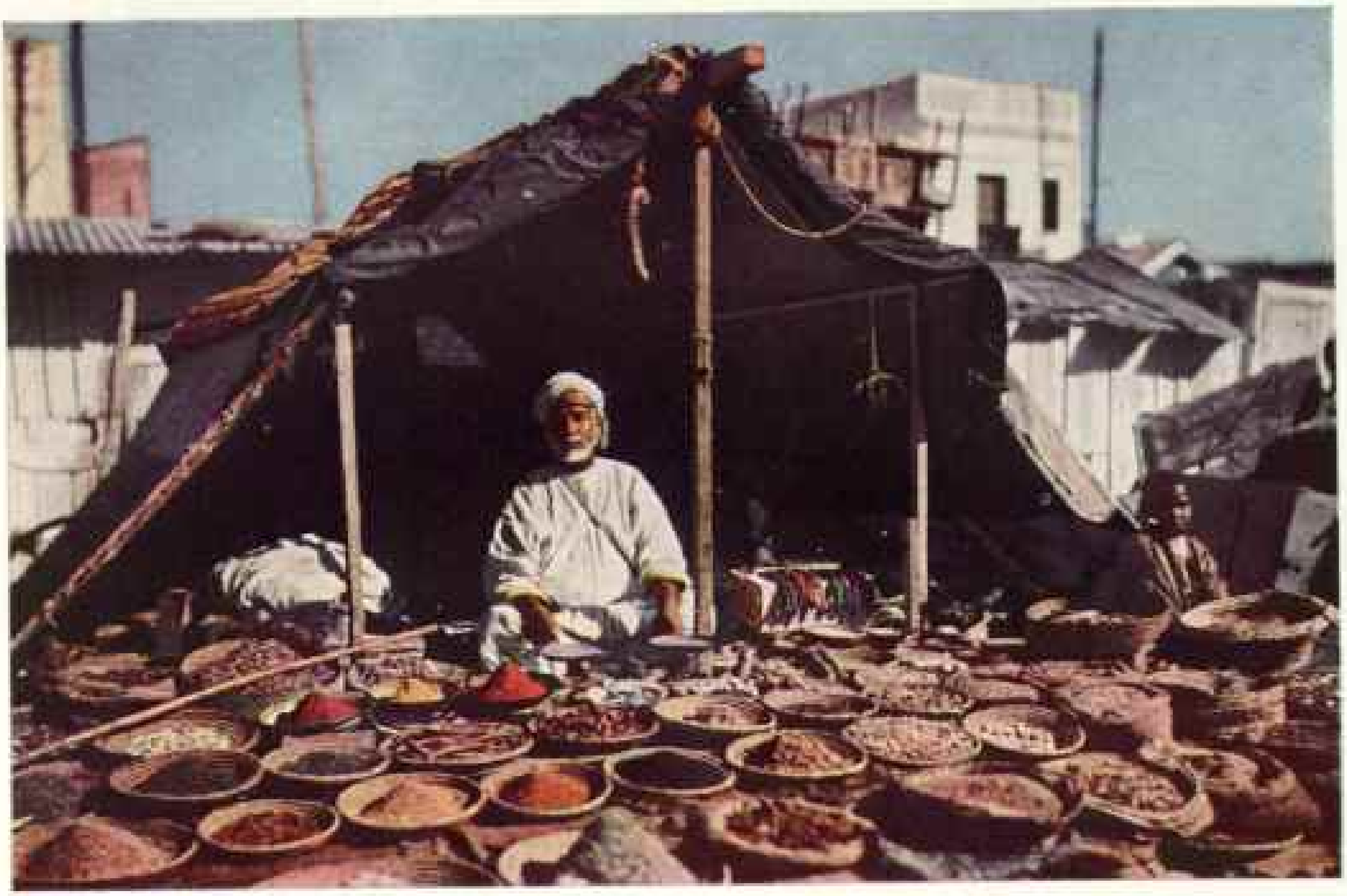
These boys with their tutor behind are children of notables in the sacred city of Moulay Idris. Burnooses, undergarments, fez, and *babouches*, or slippers, are all of the finest material and workmanship, contrasting sharply with the clothes of poorer youngsters.



Autochromes Lumière by M. Flandrin

THIS IS A MOROCCAN "CANDY STORE"

The vender in the large square of Moulay Idris is rarely without a customer, for the Moors have a sweet tooth and consume quantities of the sugary confection. They are also fond of heavily sweetened tea (see Color Plate VII).



AN OPEN-AIR DRUGGIST OF MARRAKECH DISPLAYS HIS WARES

This vender of spices and powders in the market is a Moor of the desert type. After arranging his stock carefully in baskets, he sits behind his scales and awaits "the will of Allah" (see Color Plate V).

Autochromes Lumière by M. Flandrin

THEY REAP A HARVEST OF RICH RIPE OLIVES

The fruit has been dislodged from the tree with long sticks (see Color Plate VI) and now is being carefully sorted for sale in the market of Marrakech. The Berbers, orchardists from time immemorial, grow also quantities of dates, figs, oranges, pomegranates, and almonds.

MY DOMESTIC LIFE IN FRENCH GUINEA

An American Woman Accompanies Her Husband, a Swiss Geologist, on His Explorations in a Little-Known Region

By Eleanor de Chételat

With Illustrations from Photographs by the Author

THERE are large uninhabited areas in French Guinea about which not only the white man, but even the negro, knows nothing. This astounding fact I learned when, after a 12-day boat trip from Bordeau to Conakry and a 13-hour ride on a narrow-gauge, wood-burning train that runs only twice a week, I arrived with my husband at Mamou, on the Fouta Djallon plateau (see map, page 699). Like many other modern folk, I had believed that the world today contained few if any unexplored regions.

My husband had come to Africa to explore remote lands, make maps, and prepare geological reports for the Federal Government of French West Africa. Naturally, I hoped to accompany him as far as possible into the unknown territory.

WOMEN NOT WANTED

Although the officials felt that if a woman *must* follow her husband to Africa, she should remain safe in some coast city while he adventured into the interior, we finally obtained permission for me to go along. The authorities washed their hands of us after we agreed to assume entire responsibility for anything that might befall me.

My husband made his first base camp at Pita, partly for his own convenience and partly for my comfort. Pita boasted a few white residents, who, he thought, might help me during his first absence to accustom myself to the country. Beyond Pita lies that wheelless Africa he was to invade, where the only means of locomotion is human feet, and the only means of transportation is human heads (see illustration, page 719).

I had charge of the main supplies. In response to notes brought by porters, it was my part to send to the field camp whatever was needed. Thus I made it possible for my husband to do the greater part of his field work with a caravan numbering only 15 to 20 porters. The fewer the porters, the better the time, and the fewer the complications which are bound to arise with a large group of natives in a region other than their own.

The time at Pita passed quickly. The two French administrators and their wives were most entertaining and hospitable, and taught me much about the plateau, its vegetation, and its human and four-footed inhabitants.

Each native village is rigidly governed by its chief. He is responsible to a regional chief, who is under the control of a local French administrator.

The large majority of natives in this region are Fulahs, who are talented artisans (see illustration, page 698). On our second morning at Pita two basketmakers came bearing their gayly colored baskets and round mats of all sizes. While I was still admiring their wares, the boy announced that a leather worker wished to see me. He entered carrying a collection of pointed heelless slippers, belts, and fringed leather bags and cushions.

Our reputation as good customers must have spread rapidly, for the following morning, and every morning of my stay, several natives turned up bringing me their products. The weavers brought their roughly woven cotton cloth, never more than five inches wide. What I bought I cut and gave to my own embroiderer to work as his fancy decreed.

Thus I acquired a dozen attractive small table covers, each embroidered in a different pattern. The black clay jars were rather handsomely shaped, but, unfortunately, the natives seldom bother to make pottery now. It is more stylish to use empty kerosene tins bought from Syrian traders.

ARMISTICE DAY IN AFRICA

November 11 was a holiday, and all the natives near by were invited by the admin-

THE AUTHOR'S CARRIAGE WAS FOUR HEAD POWER

Six strapping porters, necessarily of equal height, worked a one-and-a-half shift in transporting her wherever level ground permitted. She tried in vain to fold her legs beneath her in the manner of native tribal chiefs (see text, page 698).

istrator to help celebrate. I doubt whether they knew what Armistice Day commemorated, but that did not in the least detract from the jollity.

At 11 a. m. the chiefs joined us on the large veranda of the administrator's home and, after solemnly shaking hands with all of us, ate cookies with obvious pleasure. They slyly slid some up the folds of their long sleeves when they thought themselves unobserved. The drinks they viewed with suspicion, and did not swallow any until their host, who spoke some Fulah, explained that the orangeade, made especially to respect their orthodox Mohammedanism, was entirely non-alcoholic.

BEAUTY CONTEST ENDS IN TIE

The afternoon festivities started with a beauty contest for prizes of beads and money, the four white men of the European population acting as judges. The contest ended in a tie between two lovely Fulah girls wearing particularly towering headdresses. Large twisted silver rings hung from their ears. I wear as bracelets some similar ones purchased later. A pair of their handsome anklets which I tried around my arms proved much too heavy and clumsy for comfort.

After the beauty show there was a contest of grimaces. I have seen nothing more revolting. I was glad when the event ended and the native minstrels sang and danced.

THE AUTHOR ACQUIRES A HORSE

The horse race which followed was the cause of my acquiring a spirited steed. Even on the plateau, horses are scarce, and only rich chiefs can own them; yet my husband was willing to make a sacrifice for a horse that would provide entertainment for me during his many absences. The owner of the winning horse refused to sell; but the chief who owned white Koko, the runner-up, was delighted to earn the money to pay off a few of his debts.

Koko, though far from handsome, was surprisingly soft-gaited. In the days that followed the celebration, little boys shouted at me when I exercised on the plateau. I did not create any real sensation, however, until I got down to the plain, where the horse is practically unknown.

Here I diverted the whole village, the adults calling to me and the children run-

BOATMEN PUSH WHEN THE CURRENT IS TOO STRONG FOR PADDLING

Rapids also cause difficulty in the swiftly flowing Tomine River. Such home-made dugouts were obviously too small to transport Koko, the author's white horse, and, although good swimmers were scarce in the interior, Mme. de Chételat found one who led the animal through the water (see page 702). Crocodiles usually could be frightened away by clapping and shouting of natives watching from the banks.

ning for long distances almost under the horse's hoofs. I could not bring myself to use the ornate spurs which are the most impressive part of a Fulah rider's outfit. Consequently I had a hard time making my mount obey.

Late one afternoon, two singing minstrels insisted on following me during my whole ride. When I trotted Koko, they trotted alongside; when I cantered, they ran behind; when I walked, they walked next to me.

Never once did they stop playing their fiddles, and most of the time they sang a monotonous song. I felt sure that they were improvising something satiric about me, for I knew it was their custom to entertain their fellow natives with rowdy topical ballads. At the end of my ride I offered them cigarettes, which they accepted with pleasure, but I could not find out the meaning of their song.

Koko had more difficulty than I in the scramble from the 3,000-foot plateau to the plain which stretches north to the Sudan. I fear that the natural beauties of the awe-inspiring precipices were wasted on him.

We had an even worse time getting him across the deep rivers of the lowlands, for he could neither fit into the tippy dugouts nor walk across the swinging vine and bamboo bridges. On the fourth day we solved the problem by engaging Luka, a native who, unlike most of his fellows, could swim well. He quickly learned to judge the least steep point on the opposite bank of a river and would swim over to it, pulling the horse after him on the end of a rope.

No crocodiles tried to nip Koko while Luka was with us, nor were the lions troublesome, though we were much of the time in a lion country. The horse came near bolting one night at the approach of a hyena, but the men caught him easily and calmed him with a large quantity of hay.

A KITTEN PROVES USEFUL

We had another animal in our caravan, and a most useful one, a tiny kitten given me by Françoise, the wife of a Government official at Pita. The kitten was affectionate but terribly wild, and never really learned

FULAH CLOTHES SHOW THE INFLUENCE OF EARLY ARAB INVASIONS

Long-sleeved, loose-hanging gowns drape the bodies of well-to-do members of this tribe. Three wives stand beside Mamadou Alfa, a powerful chief whose cloaklike robe is heavily embroidered in geometric patterns. Some Hamite blood may account for their lighter skins, their often-thin lips, and aquiline noses. Fulahs show the Moslem scorn for manual labor, most of which is done for them by "captifs" whom their forefathers subdued.

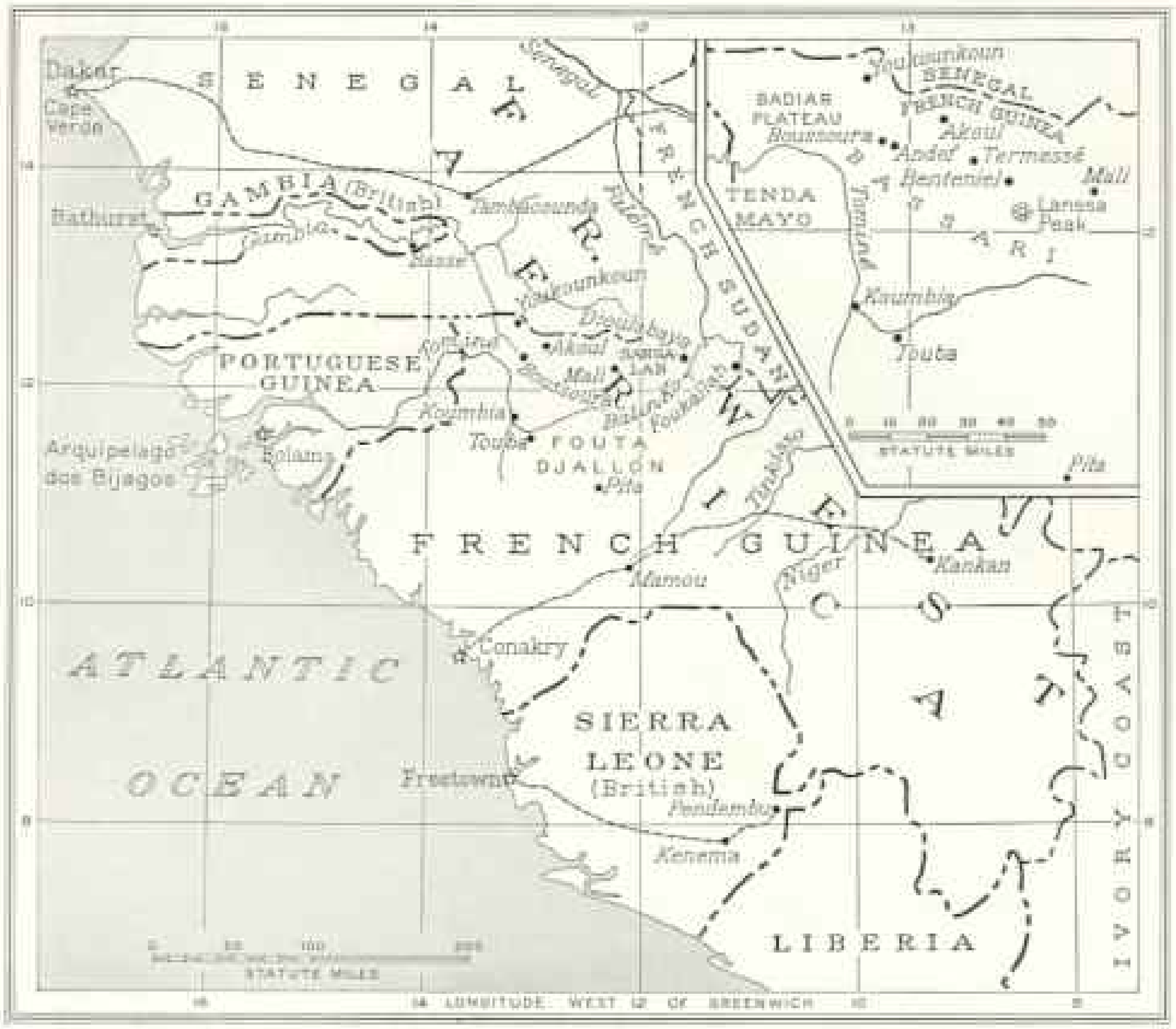
to keep her claws in. Though she covered me with scratches, I did not complain; for she kept our hut—wherever we happened to stop—remarkably free from insects or worse pests.

The chiefs of the villages through which we passed begged me to give her to them, but I always refused. She kept out rats, mice, and snakes, killed the speckled lizards, and ate the spiders, large and small. What I particularly admired was her marvelous acrobatic skill in pursuit of bats. She usually came out victorious, however sharp the conflict. No plaything I could offer gave her more pleasure than a bat's wing.

We were nine days on the way from Pita to Boussoura, where we made our second base camp. Our caravan consisted of approximately 100 men. We had two military guards, the cook, the boy, an interpreter, or local guide, eight hammock-bearers for my husband, six for me, and between 60 and 70 porters. The two shifts of hammock-bearers for my husband and the one and a half shifts for me were not kept too busy. On the plateau we could hardly ever use them, since we were perpetually going either up or down steep ravines, over rocky, uneven ground.

LUGGAGE, ORANGES, AND A RECEPTION

When relieved of their human burden the bearers carried our guns, lanterns, compasses, and cameras. Except for a few food supplies, which we could usually find locally, we took absolutely everything with us, including the house, on the heads of native



Drawn by Albert H. Bumstead

FRENCH GUINEA, FACING THE ATLANTIC, STILL HOLDS SECRETS FOR THE EXPLORER

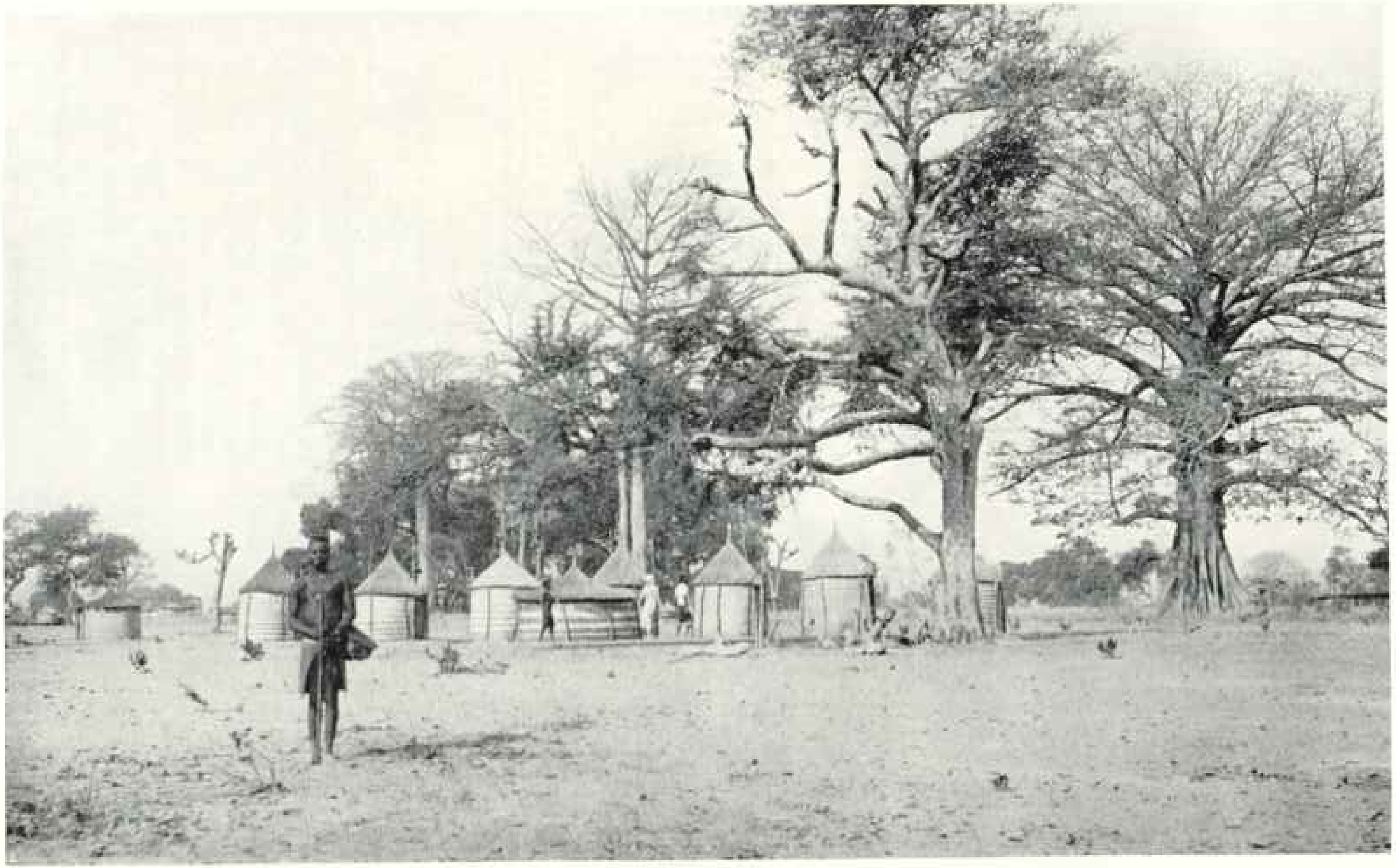
The long form of this West African colony curves away from the coast as if to shield its mysteries. From Pita the author's caravan entered a wheelless wilderness, traveling slowly northward on foot to Bousoura, home of the Bassari tribes, and on to Youkounkoun, in the land of the Koniaguis, close to the Senegal border. Journey's end was reached at Mali, nearly a mile high, in the Fouta Djallon plateau.

porters. The house was a tent which we brought along in case we struck bad weather in an uninhabited region.

Each of the regular porters carried from 60 to 70 pounds. This is a good load for a man who is working for somebody else, but I have often seen wandering native kola-nut merchants carrying loads weighing well over 100 pounds.

On the march lunch hardly counted, for it consisted of oranges, which, as we sat under a tree, we sucked almost as fast as the boy could prepare them for us. He would remove the outer yellow skin with a knife, leaving the tough white skin inside, slice off a small piece from one end, and hand the fruit to us. I never learned to eat "oranges à l'Africaine" delicately, though I did not waste any. The technique is to squeeze and suck at the same time until only the white skin remains. The serious meal of the day came in the evening.

It was getting on toward sunset as we approached Touba, home of the Malinké, and I was walking to rest the hammock-bearers. Suddenly they ran up to me and in sign language insisted that I get into the hammock. I heard tom-toms, and soon afterward singing, so that I realized we were near the village. My husband, borne on his hammock, caught up with me in time for us to make a magnificently impressive entry together. The Malinké boys and girls danced around us to the playing and singing of the musicians, and all to the booming rhythm of the tom-toms. I suspect I shall



THE HUTS ARE DORMITORIES FOR HIS FAMILY—FATHER LIVES IN A SEPARATE "DEN"

In the center of such groups of circular-shaped houses of the Koniagas usually stands the home of the spirit, sanctified residence of the local deity. The sacred wood (center background) is a gathering place of several village tribes for important sacrifices. The thatched-roof huts are made of split bamboo woven around stakes.

PORTERS PICK UP THE WHITE MAN'S BURDENS AFTER A NOON MEAL AT BENTENIEL

The caravan consisted of approximately 100 men, including two military guards, cook (in white coat and helmet), interpreter, or local guide, hammock bearers, and porters. Each of the latter carried between 60 and 70 pounds. Besides foodstuffs, scientific and camping equipment, the expedition carried a phonograph and records, presents for the natives, and medical supplies.

TERMITE MOUNDS, LIKE MAMMOTH MUSHROOMS, DOT THE CARAVAN ROUTE ACROSS BURNT SAVANNA

The author used one abandoned nest for an oven (see text, page 714). When the harmattan, a strong northeast wind, blew its dry blasts for nearly a month, tall grasses turned brown, wood shriveled, and lips and skin roughened and cracked. When it stopped, natives lighted bush fires to clear the ground for crops (see text, page 729).

KOKO CAUSED HIS MISTRESS ALL KINDS OF TROUBLE

When ill the white horse was made to swallow a wine bottle of sodium sulphate dissolved in water. Several men finally succeeded in administering the dose, but not until Koko had pulled up a stake supporting a veranda and toppled its roof upon Mme. de Chételat's head. Even his saddle had to be carried over particularly rough and hilly ground by a special boy (see page 696).

never feel more like Cæsar triumphant than I did at that moment.

A LAVISH GIFT—BANANAS

The reception committee noisily escorted us to our quarters for the night. A clean, carefully swept hut was ready for us, with some drinking water and eggs in one corner. For the cook a smaller hut near ours was reserved, firewood and hay for the horse stacked neatly beside it.

The chief greeted us almost immediately upon our arrival, gave us chickens, and inquired if we had any further needs. To show what a rich country his was, he also offered us oranges, papayas, and bananas.

While he and my husband exchanged complimentary remarks through an interpreter, and my husband questioned him concerning his region, I supervised the placing of the porters' loads, and the water containers, which the men of the locality soon filled for us.

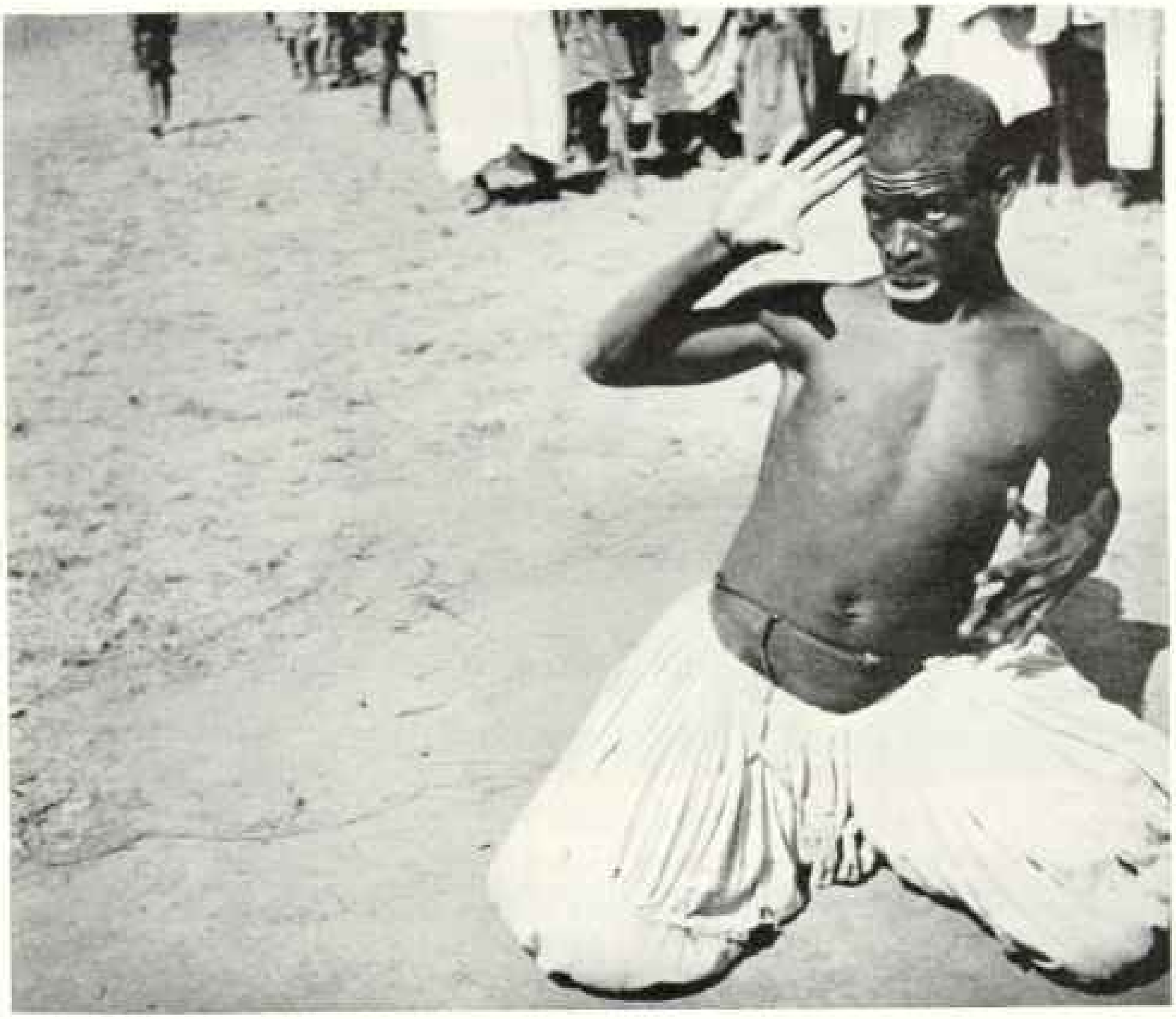
Though the native chief could not talk French, his eldest son, who had been sent to a Government school, could manage a pidgin variety. I was amused while listening to the conversation carried on between him and my cook. Since neither could understand the native African language of the other, the easiest way for them to communicate was in limited French.

BACHELORS' QUARTERS LINE A KONIAGUI VILLAGE

A three-year initiation ceremony is given as a part of every boy's training. It is held secretly, far in the distant bush, and afterward each youth lives in a home of his own on his father's compound (see illustration, page 718). Although the isolation period is supposedly a part of the young man's preparation for manhood, the author gleaned that its chief purpose was to teach him how to keep woman in her place (see text, page 729).

THREE FULAH-KUNDA WOMEN PRESENT THE AFRICAN "PERMANENT WAVE"

It took Fulah natives hours of patient agony to have their hair dressed. Talented and clever artisans, these people offered gaily colored baskets, mats, and leather goods for sale.



NOISY DRUMS AND XYLOPHONES ACCOMPANIED HIS WEIRD DANCE

A native minstrel interpreted the Leopard Dance for the entertainment of Fulahs at Pita, as part of an Armistice Day celebration. Scores of small boys staged a contest of grimaces that the author found extremely revolting. Particularly gruesome, she thought, was their distorting of their faces and bodies to simulate the effects of different diseases.

Since the day's march had been long, we rewarded the men with some meat. The chief sent us a sheep for which he asked 12 francs. After the cook had slaughtered it and we had selected our favorite cut, strict social etiquette demanded that we present the next best piece to the chief, and the third best to his eldest brother, before giving the rest to the men to divide as they wished.

The odor of mutton roasting over open fires soon filled the air, and there was a noisy jabbering of the pleased and excited natives. Even after the last bit of meat had been consumed, the loud conversations around the fires continued. Finally my husband had to send Mamadou-Guard to silence them so that we could all get some sleep and be ready to start off again early next morning.

Just beyond Koumbia we got our first view of the Bassaris (see illustration, page 708), a non-Moslem, or fetishistic people of the interior. Handsome young boys, stark naked and carrying long bows and arrows, stepped to one side of the trail to watch us pass and called out affably, "Bonjour, Monsieur!" Their broad smiles disclosed white teeth nicely filed to sharp points.

It did not take us long to realize that the hardy Bassaris, well built and muscular, made superlative porters. We entrusted the trunk containing most of the dishes and kitchen utensils to a particularly tall and fine-looking fellow. He was not naked like the rest, but wore a long gown which he said a Fulah had given him—something unusual if true, for the Fulahs and Bassaris are ancestral enemies.

THE "BEAUTY SCARS" OF THE GIRLS LOOK LIKE HAMMERED COPPER

Because they believe such cicatrization adds to their beauty, these women willingly submit their flesh for decoration. Kaline (see text, page 729), the author's porter and interpreter, seems to have a monopoly on the girls, his shy fiancée and a mirthful friend. Luka, the white-robed Fulah, is not sure he belongs in a picture with the others, who are Koniaguis. Topknots of beaten bark protect native heads when heavy loads are carried.

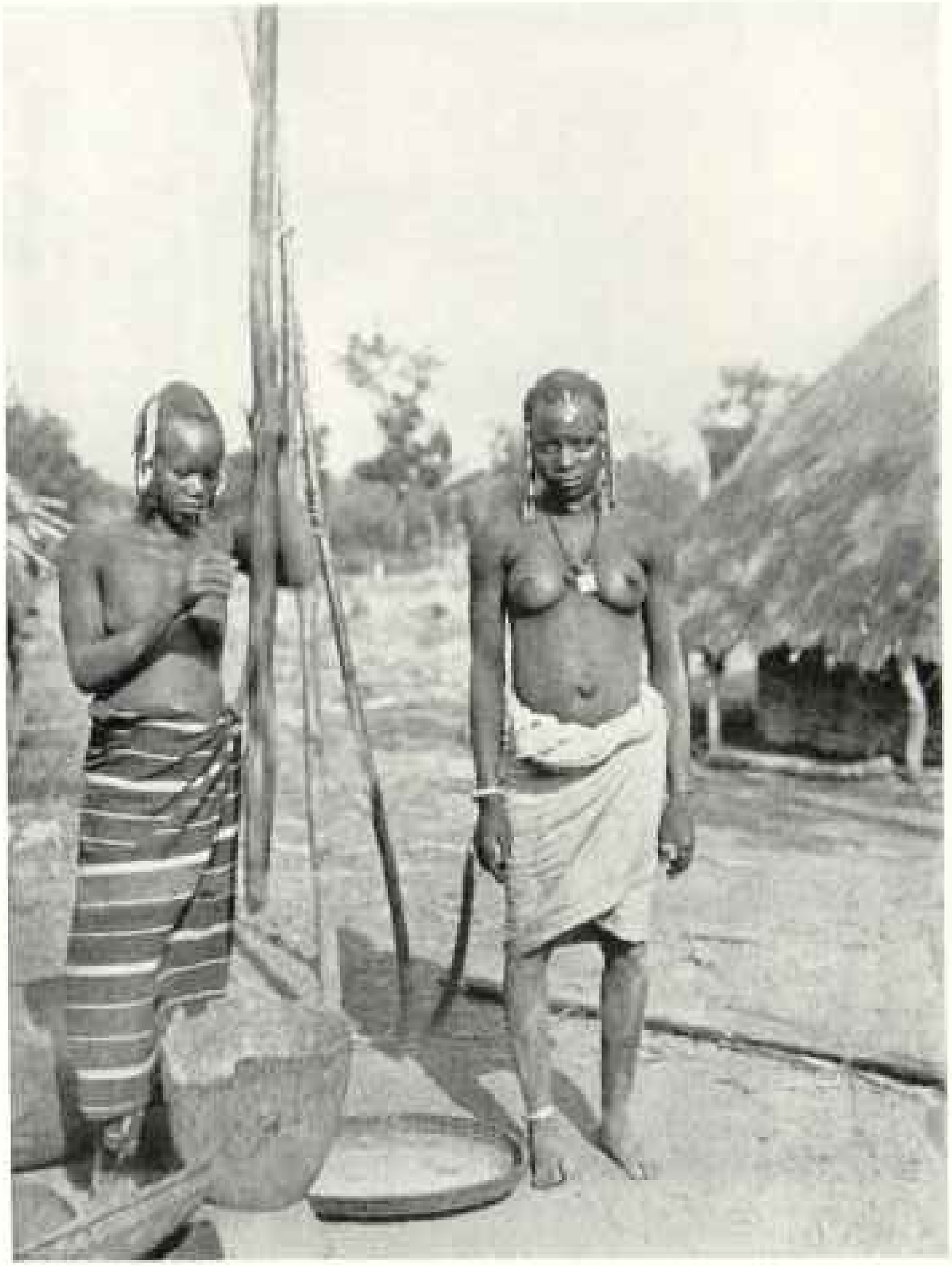
Little by little, the country through which we were passing grew steeper and rockier. Suddenly I heard a tumult that caused me to hasten my steps to the edge of a ravine. The trunk which was marked to be handled with care lay upside down at the bottom of the ravine and near by an angry group of porters was threatening the one who had dropped his load.

The guard Mangalai, who walked in the rear, soon dispersed the crowd. He explained to me, with a sneer toward all Bassaris, that of course the savage had tripped over his clothes because he had never worn any before and did not know how to manage them. Astonishingly enough, only two plates were broken!

Camped near a shallow stream that evening, we decided to refresh ourselves with a plunge before supper as a variation from the usual "dip and pour" shower. About a dozen of our porters were sitting on the bank when we approached, watching us with interest. My husband, wearing trunks, went into the water first, and then I removed my bathrobe, revealing a green bathing suit. The moment I did so they all rushed away into the forest.

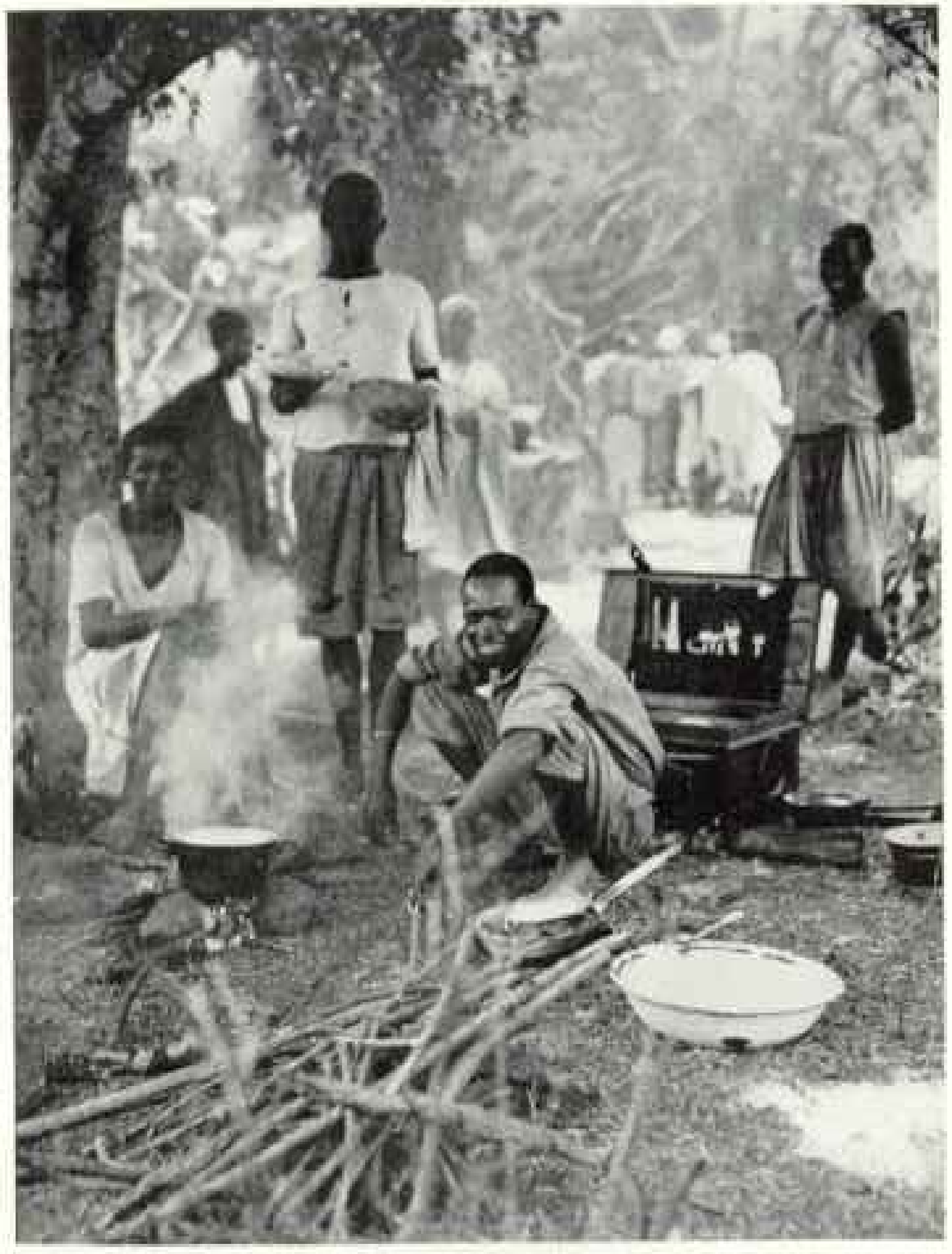
Evidently the sight of me had shocked them. Just why I could not understand, for both sexes among the Bassaris go practically naked except for a few ornaments.

We passed a couple of months in the Bassari region, using Boussoura as our base. By some devious means which I was never able to fathom, Mamadou Alfa, a powerful Fulah chief, had made himself, with French permission, ruler of the entire section—over



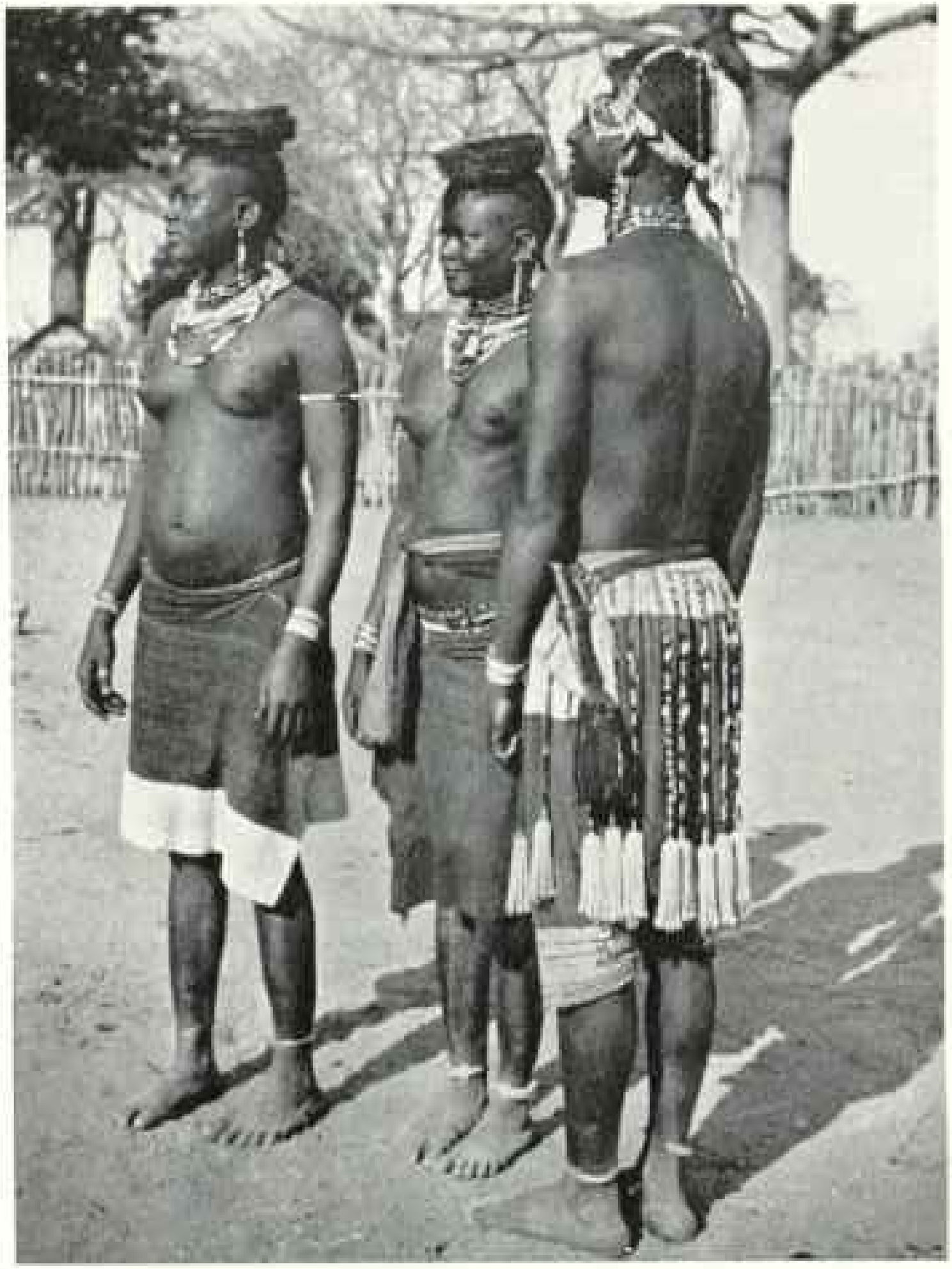
THEY SEPARATE THE GRAIN FROM THE CHAFF

Fulah-Kunda women of the plain north of the Badiar Plateau pound millet, staple food of the region, after the kernels have been taken from the husks and placed in a wooden mortar. Here the grain is broken up and the hulls are removed. It is then poured into the shallow, woven-fiber tray (bottom, center) for winnowing.



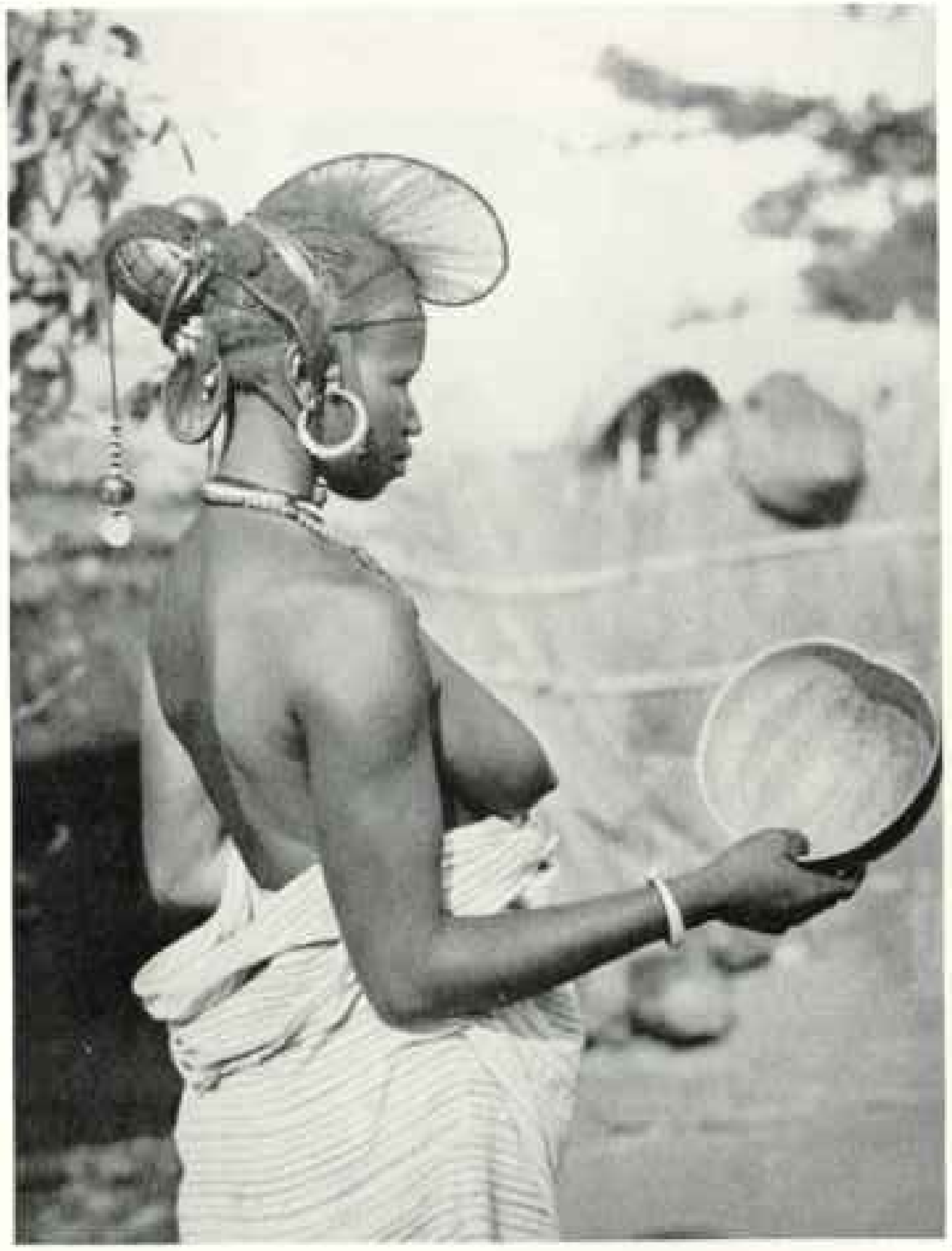
COOK, AND THE NATIVES SMILE WITH YOU

The expedition "chef" prepares a midday picnic meal in the shade of a large tree. For native porters rice was the principal dish, occasionally varied with meat—chicken, antelope, sheep, or a goat. Runners were sent to villages along the way for food supplies. The modern chest of luncheon equipment was an awesome innovation to African tribesmen.



TWO BELLES AND A DANDY OF YOUKOUNKOUN

With his tasseled skirt, fanciful headdress, and numerous necklaces, the young Koniagui at the right is particularly well attired. When the much-cicatrized girls, in bark head protectors, filled the water jars of Mme. de Chételat, she noted that they brought other women each time they returned. Upon investigation she found them giggling delightedly as they primped in front of her mirror (see text, page 721).



HER SARTORIAL ATTENTION IS WHOLLY DEVOTED TO HER HEAD

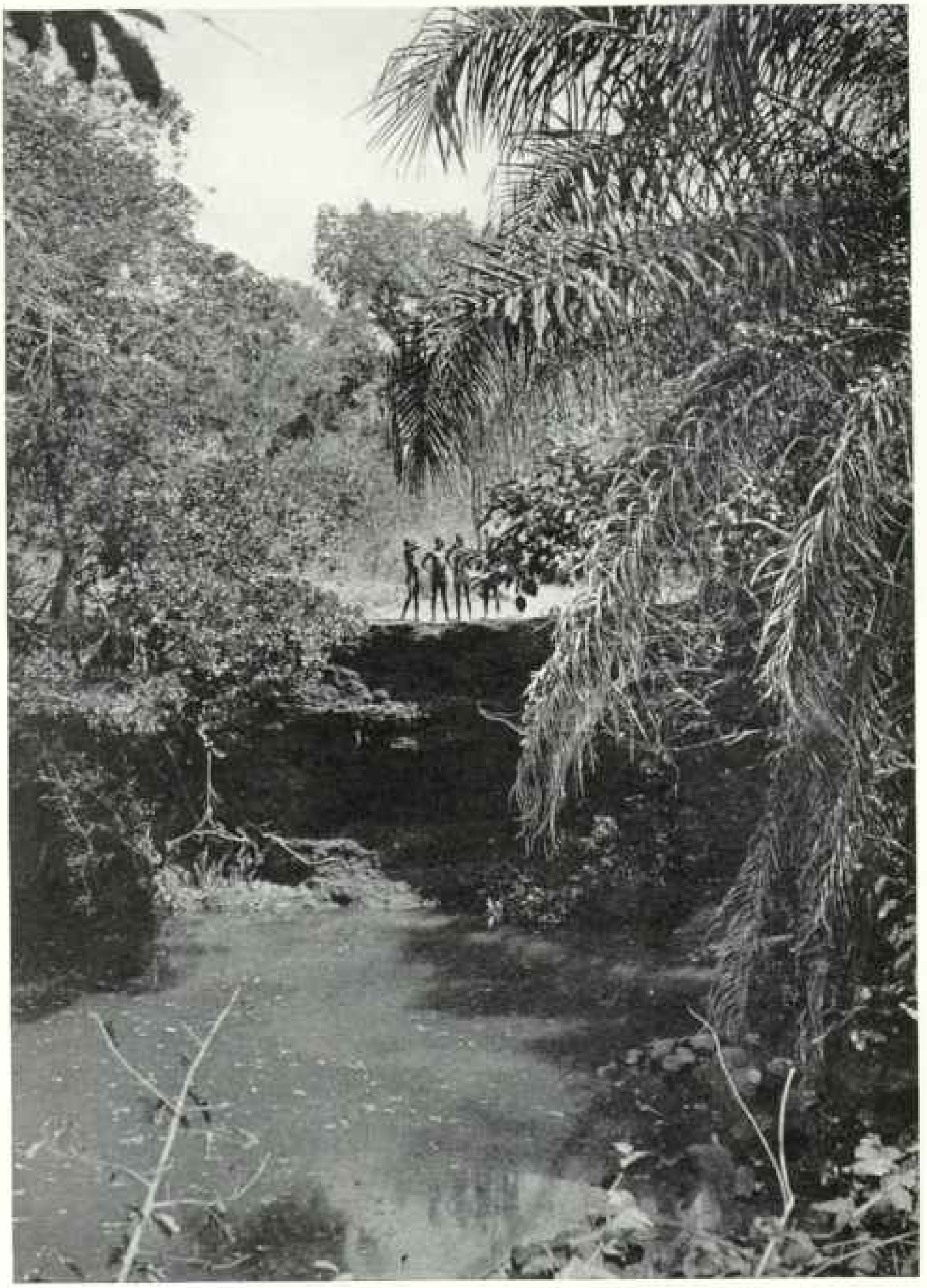
A curving bamboo barrette makes a kind of butterfly-wing effect on top and at the back. Strands of her own hair hold a small hardwood square from which hangs a pendant of false amber and coins. Above the square is a ball made either of wood or engraved metal. She holds half a calabash, the usual African dipper or dish. The author purchased, for bracelets, several earrings like the one shown.

ARCHERY IS A FAVORITE SPORT AMONG YOUNG KONIAGUI BOYS

"*Bonjour, Monsieur,*" they greeted M. de Chételat, proud to display their slight knowledge of French. The five self-conscious youngsters carried long bamboo bows and several arrows.

WEALTHY FULAH WOMEN INTERWEAVE THEIR OWN HAIR WITH BAMBOO TO MAKE "HATS"

Pliant rods hold the strands, fanlike, high above their heads. The large knot at the back is decorated with beads of glass, wood, and false amber. They are natives of Termessé, at the northern base of the Fouta Djallon plateau (see map, page 699). The two at right wear imported cotton gowns, gaily printed on a white background. The woman at the left wears a native woven garment of cotton strips sewn together.



THE SPRING NEAR TERMESSÉ IS A REFRESHING OASIS

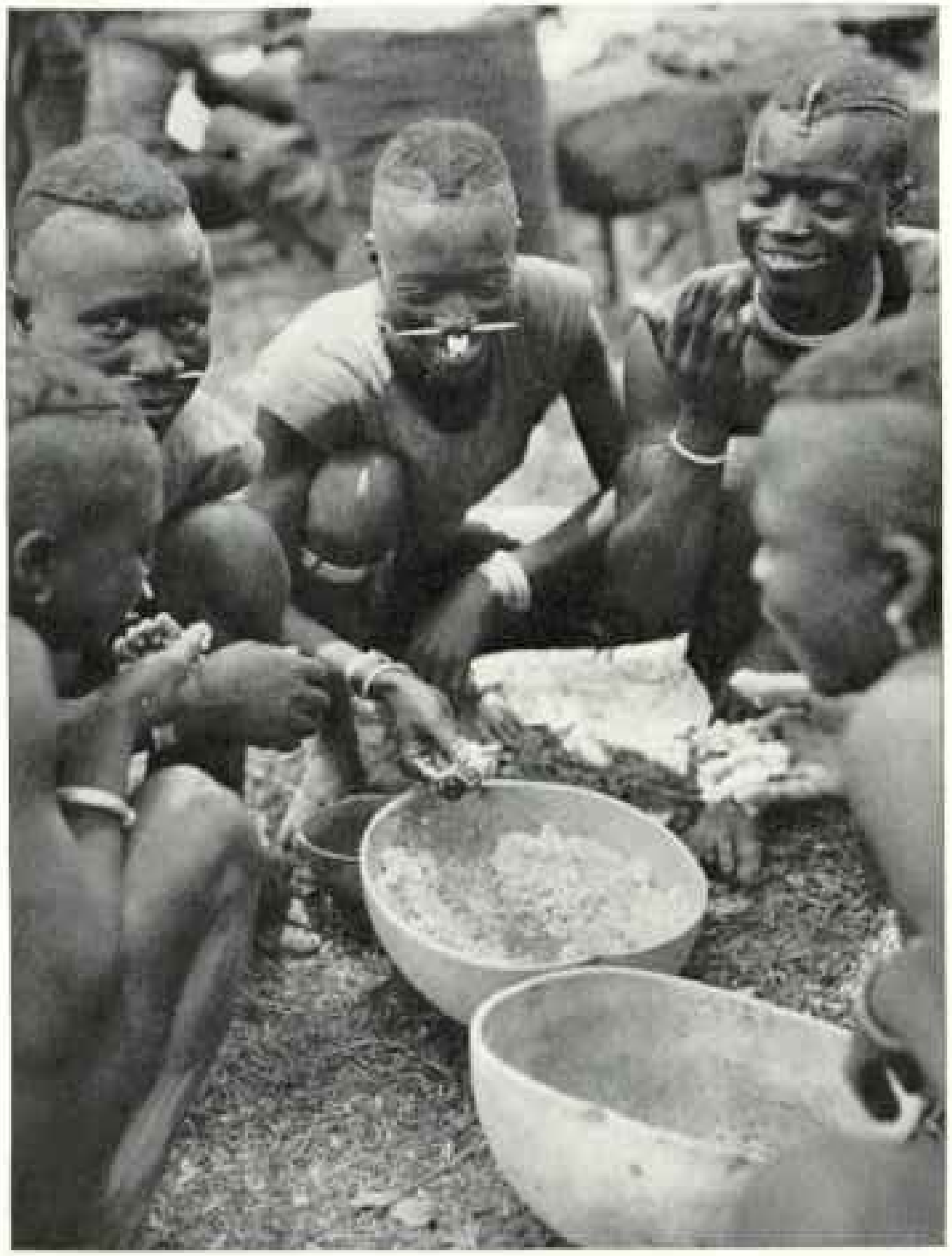
The water bubbles from a porous, reddish earth formed by decomposed rocks. It flows thence into a small tributary of the Gambia River. The expedition always filtered its drinking water, and sometimes boiled it as well. In the dry season it was almost impossible to get it entirely clear, and an unpleasant taste remained in spite of added lemon juice.

THIS FULAH DANCER WOULD MAKE THE PERFECT SCARECROW

The cook for the expedition, a native of the Fouta Djallon Plateau, had never before seen such a performance as this dweller in the plains at Boussoura put on, although both were members of the same tribe. The mask is made of black cotton cloth; the hulalike costume, of leaves and bark.

SHE WOULD BE A FIT SUBJECT FOR AN AFRICAN RAPHAEL

Many trinkets such as she wears are purchased from Syrian traders by the menfolk who sometimes are employed on peanut plantations, or as fence builders, in British Gambia or Senegal. The headdress of this Fulah-Kunda mother is made from her own hair.



THE WAY TO A PORTER'S HEART IS VIA HIS STOMACH

A runner was sent ahead to this village, at the foot of the Lanssa Peak, to notify the chief that he might expect guests for dinner. Women prepared rice, served with peanut-butter sauce, flavored with pimentos and tomatoes.

HIS RAZOR IS OFTEN A PIECE OF BROKEN GLASS

While resting after lunch one Bassari porter, temporarily a barber, would shave off the hair of the others, leaving a tuft along the top of the head from front to back. Sometimes the cutter used an old pocketknife.

A BASSARI FLUTE BLOWER IS ACCOMPANIED BY DANCING YOUTHS RUBBING RIDGED PALM WOOD

A loud, hollow sound issues from the crude instruments when their grooved surfaces are stroked with sticks. Another native instrument is made by stringing lengths of hoa skin and horse-tail hairs across the opening of half a calabash. Even the hot noon sun could not restrain these dancers as long as millet beer, sweet and strongly alcoholic, was consumed. Some of these performers at Andef wear short, fringed skirts; others, strange leggings; and several, clusters of anklets that clank in the rhythm of weird music. Thatch layers, placed like shingles, cover their circular, poorly lighted and badly ventilated huts.

BASSARI DANCERS OF THE INTERIOR PERFORM IN ELABORATE RELIGIOUS TRAPPINGS

Three representatives of minor deities, holding ritual spears, have bedecked themselves in leaves and long-bearded masks of palm-tree fibers. The gala finery of the women includes leather belts studded with colored beads and cowries, white metal bead necklaces, and quantities of bracelets and anklets. Each nose is pierced by a porcupine quill. Unlike the Fulahs, these natives of the Boussoura region are a non-Moslem people.

BABY ATTENDS THE DANCE IN A BUCKSKIN SACK

Bassari mothers strap their infants on their backs, carrying them in much the same manner as American Indian squaws carry papooses. With so many anklets, it would seem difficult enough to walk, let alone dance. The leather "tail" is decorative, and the row of bells probably entertains mother as much as baby.

Fulah and Bassari alike. He is a striking-looking man, tall and thin, with a long, sharp face and a pointed beard which partly hides a narrow, cruel mouth. He treated us with the utmost consideration, and even brought three of his wives to pay me a call (see Illustration, page 698). Afterward they accepted our gifts of brightly colored bandannas and beads with evident pleasure. Even Mamadou Alfa smiled graciously when we offered him a bottle of lemon syrup.

By courtesy of Mamadou Alfa, whose brother was the owner, we occupied three small, but clean and new, Fulah huts on a hill above the village. All Fulah huts are circular, with hard-beaten earth floors, thatched roofs, two doors, and no windows. One door leads out, the other opens into an enclosure made of high bamboo stakes—a most convenient place for our shower bath. One hut we used as bedroom, with private bath attached, and we kept our tin trunks around the walls. The second hut was the office, dining room, and parlor; the third, sleeping quarters for the two guards, the cook, and the boy.

In the second hut we kept the camp table and two chairs, a bookcase and sideboard of modernistic form, composed of crates. Our wooden boxes were moved daily, or raised on bottles hammered into the ground; without this precaution the termites, prevalent everywhere, would have eaten every crate.

The termites, although generally a nuisance, proved useful in one way. They build large, solid anthills which they desert after a period to make a new home (see illustration, page 701). One of these empty mounds, when hollowed out, formed a splendid oven after a door was attached to the opening. This door, which we always car-

ried with us, was made out of a wooden box and a kerosene tin.

HORROR LURKS IN AN OVEN

The afternoon after my husband's departure I told Abdul, the cook, to give me a roast chicken for dinner. I was rather surprised when he appeared before me toward 6 o'clock with an expression of dismay. It would be impossible for him to roast the chicken in the oven, he said, because a snake had just got into it. I laughed at him and asked what a snake could want in a heated oven. He was so upset, however, that I told him to pot the chicken instead.

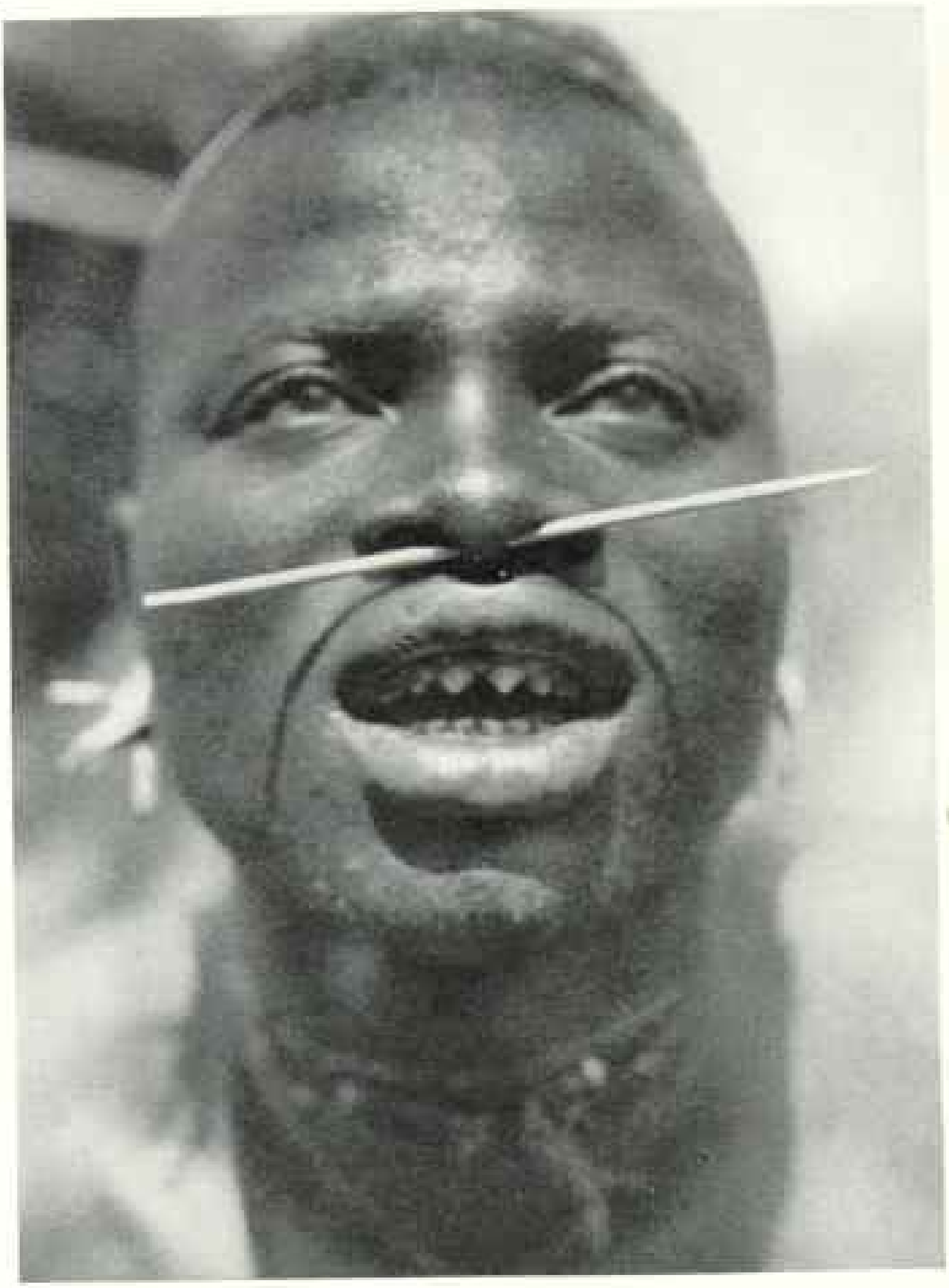
About 10 o'clock that night he called me to come outside and see the "spitter." With the help of a friend he had killed the snake. There in the dim light of his lantern lay a large, heavy, black spitting cobra.

Mamadou-boy was somewhat of a sentimentalist. Although he had left one wife at home in his native village of Pita, he fell in love with a smiling young brunette at Boussoura and wanted to marry her also. To his deep regret, her family was away, and there was no one with whom he could come to an agreement about her price. He begged us to try to make some arrangement for her purchase through the intercession of Mamadou Alfa, but the big chief smiled and answered that he could not assume that heavy responsibility. Mamadou-boy would have to console himself with a photograph of her which we took for him.

SPREAD-WINGED, THE EAGLE MEASURED SEVEN FEET

Swift raider of the air, its marauding days on the Guinea plain were ended by a well-placed shot. The Bassari's feet are protected by leather sandals, worn in particularly stony country. A flat, six-inch leather bag usually is hung over one shoulder.

Strange as it may seem, I was kept busy at Boussoura, as well as at our other base camps, even while my husband was away. Typewriting reports for him was a tedious process, but did much toward improving my French. The wear and tear on our clothes from walking and climbing through rocky



FOR "FULL DRESS" HE WEARS THIS PORCUPINE QUILL

A stick of bamboo serves at other times. He is a typical Bassari tribesman, with characteristic flat nose and thick lips. Noses of both men and women are pierced at an early age. Filed teeth, such as his, are in style only in certain villages. Although ancestral enemies, Fulahs and Bassaris live peaceably together.

and thorny country in the tropical heat, and the constant washings, forced me to spend hours darning, mending, and repairing.

Our pillows became uneven and lumpy after a while, and I determined to make new ones. The day after I had made known in the village that I was in need of kapok, a boy turned up carrying on his head a huge basket filled with it (see illustration, page 730). On first appearance the quantity which he brought me seemed enormous, but after I had picked it over with the help of four little blacks, and removed the impurities, there remained barely enough for my needs.

For a few days I ambitiously tried to collect moths and butterflies, but in less than a week the better portion of my collection was devoured by insects. I gave up the attempt for lack of sufficient equipment.

PHONOGRAPH MUSIC HATH CHARMS

After supper on my third evening alone in Boussoura, I felt the need of music. It was warm, and I brought the phonograph outdoors and settled myself comfortably in the chaise-longue to enjoy "The Fire Dance." I remained alone less than 10 minutes. From all directions came the natives to stand or squat about me just beyond the nimbus of light thrown by my lantern. Before the third record had finished playing, perhaps 60 or 70 men, women, and children were grouped around listening.

The "music box" obviously fascinated them, but they did not get noisily excited until they heard the human voice. When I put on "Bend Down, Sister," in which the singer also laughs, they jumped up and down, shrieking with glee. When I announced through the cook that I was about to play the last record, their disappointment was keen, and at the end they delegated a brother of the chief to ask me to give them a concert every evening. I told them I considered that a bit too often, but I promised to do so every second evening, and kept my word.

Two days later the youngsters collected even before I had finished my supper, and some of the boys danced, one at a time, doing a sort of barefoot tap dance, with

THEY HOARD BRITISH AND FRENCH SILVER COINS FOR THEIR HEADDRESS

These Diakanké girls of the Sangalan district are not dressed for a party; they wear their hair in such fashion all the time. The large earring, after piercing the lobe, is passed through the loop of a strap to hold it in place. The girl at the left wears four additional rings in her ear.

PROFUSELY ORNAMENTED, THEY LOOK LIKE HUMAN TRINKET SHOPS

Rings, necklaces, nose-pieces, bracelets, medallions—all satisfy Bassari vanity. The handsomely attired huntsman wears a large pair of boar's tusks hanging on his chest. His gun is a muzzle-loading flintlock, the only firearm permitted the natives without a special license. Some date from the Napoleonic period; others are manufactured even today in Belgium.

THE WAIT FOR DINNER IS ALMOST OVER

Koniagui women and children have prepared the evening meal in a huge kettle over a crackling wood fire. The housewife keeps her calabashes, earthen jugs, and baskets inside the hut, used as a kitchen. She lives in another split-bamboo and thatch dwelling with her unmarried daughters and small sons. Each Koniagui male occupies a separate hut (see page 700).

A NATIVE COLLECTS OIL-PALM SAP TO MAKE WINE

The long, branchlike spokes seen radiating from the trunk are hollow bamboo sticks that have been thrust into the upper and greener part of the tree to trap the liquid. Gathered every few days by Koniagui boys, mixed with water, and allowed to ferment, the sap forms a highly intoxicating drink, which proved an incentive to dancing.

THE HUMAN HEAD IS THE COMMON CARRIER OF THE PLATEAU

Here the author's metal trunk-bathtub goes aloft as the caravan resumes march. Generally it was easier to take a shower—"dip and pour"—than a tub. Occasionally she bathed in streams along the route. Although the natives wear no clothes, they seemed shocked at her bathing suit (see page 705).

DIAKANKÉ WOMEN WASH FOR GOLD AT FOUKAILAH

Alluvial placers along some of Guinea's rivers, notably the Tinkisso, yield grains of the precious metal. In one year gold to the value of about $150,000 was exported. The natives, working on the Falémé River, are being watched by a French Government topographer.

NATIVE ORE IS SMELTED IN THESE BLAST FURNACES

Diakankés forge their own knives and hoes from iron mined in the vicinity. Local smiths make many bracelets and arm bands worn by the womenfolk, although brass, copper, tin in bar form, and rolls of wire are generally purchased from Syrian traders.

plenty of hip motion. Mangalai, the military guard who had been a "tirailleur" on the Western Front during the World War, had learned to fox-trot. He grabbed one of the girls around the waist in an attempt to demonstrate the manner in which the white man dances, but after a second she broke away, screaming and laughing, shocked at this "indecent" European custom.

THE AUTHOR TURNS PHYSICIAN

At Boussoura, in particular, the entire neighborhood appeared to look upon me as its medical adviser, although native witch doctors were plentiful. I was flattered, but worried, by this confidence, and unfortunately was never able to suggest any radical treatments. Innumerable cuts and wounds were brought to me for iodine and bandaging. The commonest malady was intestinal worms, which a good strong purge seemed to cure effectively. Drops of argyrol in the eyes of natives with whom trachoma had not developed too far were gratefully received.

The natives were piteously disappointed when I shook my head and told them there was nothing I could do for cases of elephantiasis. Against all my principles, I sometimes gave natives in the early stages of leprosy the drinks of kerosene for which they implored. I tried to find out, but never could, where they got the idea of using kerosene internally.

The curative properties of quinine were generally known to the Fulahs, and had our supply been larger we could have helped in many more cases of malarial fever than we actually did. Whether the bubu, or cotton robe, worn by the Fulahs decreases their resistance to tuberculosis, I do not know. But it is certain that consumption

WHEN WHITE MEN CROSS PATHS IN THE AFRICAN BUSH—THAT IS A NEWS PICTURE!

Two scientists of the French Government halt their survey work to celebrate the unusual event of meeting deep in the interior. Standing near the center of a group of porters and guides is M. Enzo de Chételat, geologist, and husband of the author, and, at the right, a lieutenant of the French Colonial Infantry who was making a topographic study (see illustration, page 719).

among them is enormously greater than among the more naked and much hardier Bassaris or Koniaguis.

One of the most pitiable cases was that of a four-months-old baby with a terribly swollen stomach. Its parents had carried it hopefully many miles from a distant village to bring it to me to cure. Of course, I had no idea what it was suffering from, and would not have dared prescribe real medicine for such a small baby in any case. For the sake of the parents, almost as much as for that of the baby, I simply had to try something. I gave it some fruit salts and showed the mother how to dissolve more for future use. I never saw it again, nor do I know whether my ministrations were successful.

We reached Youkounkoun, our third base camp, at 4 in the afternoon, and as usual one of my first thoughts was to take a shower. The Koniagui chief who greeted us told me that the water carriers were on their way. Sure enough, I soon saw a line of them approaching, with large calabashes on their heads. As they came closer, I observed that they were all women.

NATIVE WOMEN ENJOY A MIRROR

"Why," I asked the chief, "are those women bringing us water?"

His reply was short and to the point. "Carrying water is a Koniagui woman's work."

I accustomed myself to the sight of eight or ten of them bearing us water in the morning. After this had been going on for a few days, I had another surprise. The women began to come at all hours of the day, and new ones would accompany them. I was

NATIVES USE PRIMITIVE SCIENCE IN BUILDING ROADS

They heat a rock with large fires and then dash cold water over it. The mass is cracked open by sudden differences in temperature, and broken pieces are pried away by iron wedges. Thus they speed up the process of alternating heat and cold which Nature uses in forming deserts—but still the method would be slow were time any object.

TENDAMAVO WOMEN EXTRACT SALT FROM THE EARTH

The rude bench supports a closely woven basket that filters a mixture of clay and water. A leafy funnel conveys the dripping solution to a receptacle below. It is then evaporated by boiling.

delighted to get a bigger water supply, but curious to know the reason. Determined to find out, I watched from the corner of my eye as they circled the veranda, emptied their calabashes into my water containers, and then, one by one, gazed at themselves with wide eyes in the mirror I had hung on the back door.

The glass was only about a foot square, but they had a thrilling time posing in front of it, making faces and then all bursting into peals of laughter. As I walked over to them, they sobered down, but when I told them they might bring any friends they wished in the morning hours, they left much pleased.

The little boys were an amusing lot, too, and very expert with the bow and arrow. Just before dusk we held archery contests, and I rewarded the winner of each with a box of matches.

THE MARKET COMES TO THE CUSTOMER

Finding food for ourselves was not always easy. We used as many local products as we could, and at Youkounkoun were lucky in finding quite a variety. I seldom went to the village market; it came to me instead. Fota, a handsome young nephew of the Koniagui chief, appeared at 8 o'clock on the morning after our arrival with a large chicken in one hand and a calabash of eggs in the other. He could speak a few words of Fulah, and with the Fulah cook acting as interpreter we could understand each other.

I suggested to him as politely as possible that in future I would prefer my chickens young and small. He showed surprise, but cheerfully assented; then obligingly inquired if I had any further needs. When I told him what I required, he made it known in the village near by.

In a short time the villagers appeared, bringing me a plentiful supply of fonio, rice, corn, manioc, peanuts, honey, yams, and beans. A little later in the season they also brought me small onions and tiny tomatoes.

I enjoyed experimenting with the native produce, and the cook, Abdul, quickly caught on to my wishes and even offered excellent suggestions of his own. He made fairly good "spinach" from yam leaves; a delicious pudding of fonio, a grain tasting rather like rice; and surprisingly fine croquettes of manioc, a root somewhat similar to the potato. Many kinds of native beans made good soup, and with some of our precious bottled bacon he cooked excellent pork and beans.

CALABASHES AND SOAP RIDE SAFELY ON HER HEAD

The Bassari woman supports her laundry equipment, the black ball within the smaller bowl being native soap made from palm and peanut oils and ashes. At her waist are grapelike clusters of dried seed pods. The beads are strung from glass made mostly in Italy and Czechoslovakia. The tiny bell dangling at her knees probably was brought by a suitor returning from work in Gambia, but the decorative tassels are locally made of antelope skin. Bassaris prefer blue and red colors; Koniaguis will wear black, white, and yellow.

Though the Koniaguis grow extensive grain and peanut crops, they never plant a fruit tree. Therefore, we had to send to distant Fulah communities for papayas, and when we wanted oranges or lemons we had to dispatch porters all the way up to the far-

IN SPITE OF TENDER CARE, THE BABY GAZELLE DIED

Captured a few minutes after it was born, the dainty and graceful animal was fed with warm milk from the wine bottle held by one of the military guards. The author named it Yoro, and it lived with her in seemingly good health for two weeks. Mme. de Chételat was given also two civet cats and a green pigeon.

off plateau to get them for us. Since fresh oranges soon dried out and spoiled, I learned to make marmalade. Sugar was comparatively easy to order, and we always kept large quantities on hand; but good jams could be bought only on the coast.

Another custom of the Koniaguis is to keep cattle for meat only; consequently, in order to get milk we had to send to the nearest Fulah village, by no means near. We were glad to pay well for the milk, and the trip gave a little boy his daily exercise. Abdul boiled the milk as soon as it came, and if in the evening there was any left he boiled it a second time. Thus without ice it was kept from souring.

Even with our numerous porters we could not carry enough supplies to last the entire eight months in the interior. About every two months we had to send porters to the nearest white settlement. Our lists were always composed with forethought and care, for it took at least three weeks for the porters to return with the goods.

My excitement was intense on the memorable afternoon of the return of some porters we had sent from Youkounkoun to Basse in British Gambia. In one of the crates was a Bathurst paper not 12 days old!

The French and American newspapers generally took about six weeks or more to reach us, although the postal service was really very good.

Mail came as far as it could by railroad and camionette, and from then on was carried by relays of porters. This relay system saved time and moved much faster than we could move ourselves, fresh porters replacing the burdened ones at frequent intervals,

WILD GUINEA FOWL WERE A WELCOME VARIATION TO A LIMITED MENU

Although the expedition members could not spare time for much hunting, when edible game crossed their path they made the most of the opportunity. Although the author's gazelle died, she had no trouble in keeping alive a pair of guinea fowl which were easily tamed. At night they roosted in trees; when the march was resumed they were carried in a basket.

M. DE CHÉTELAT ADMIRES NATIVE ORNAMENTATION AT AKOUL

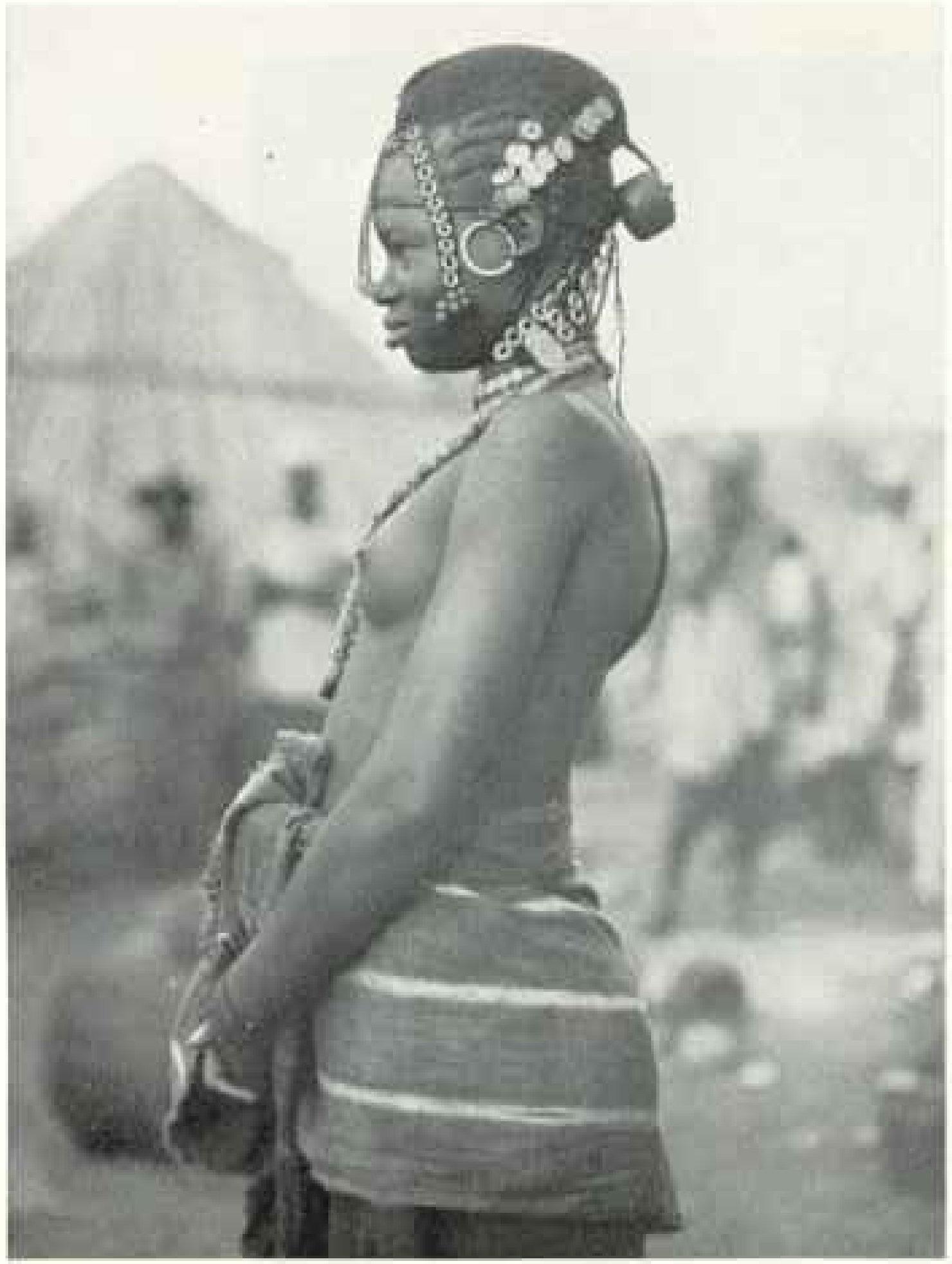
Bassaris at the caravansary wore numerous, heavy metal gimcracks around their necks, arms, waists, and legs. Belts of rings encircle the hips of the girls at the right, and several neckpiece hoops hang at their throats (see illustration, page 723).

THE UMBRELLA IS HIS BADGE OF THE WHITE MAN'S TRADING

The Koniagui boy, in Sunday best, attended a missionary school. The shade, no less than the helmet, clothes, and scimitarlike sword, gave him a certain dignity and prestige in the community.

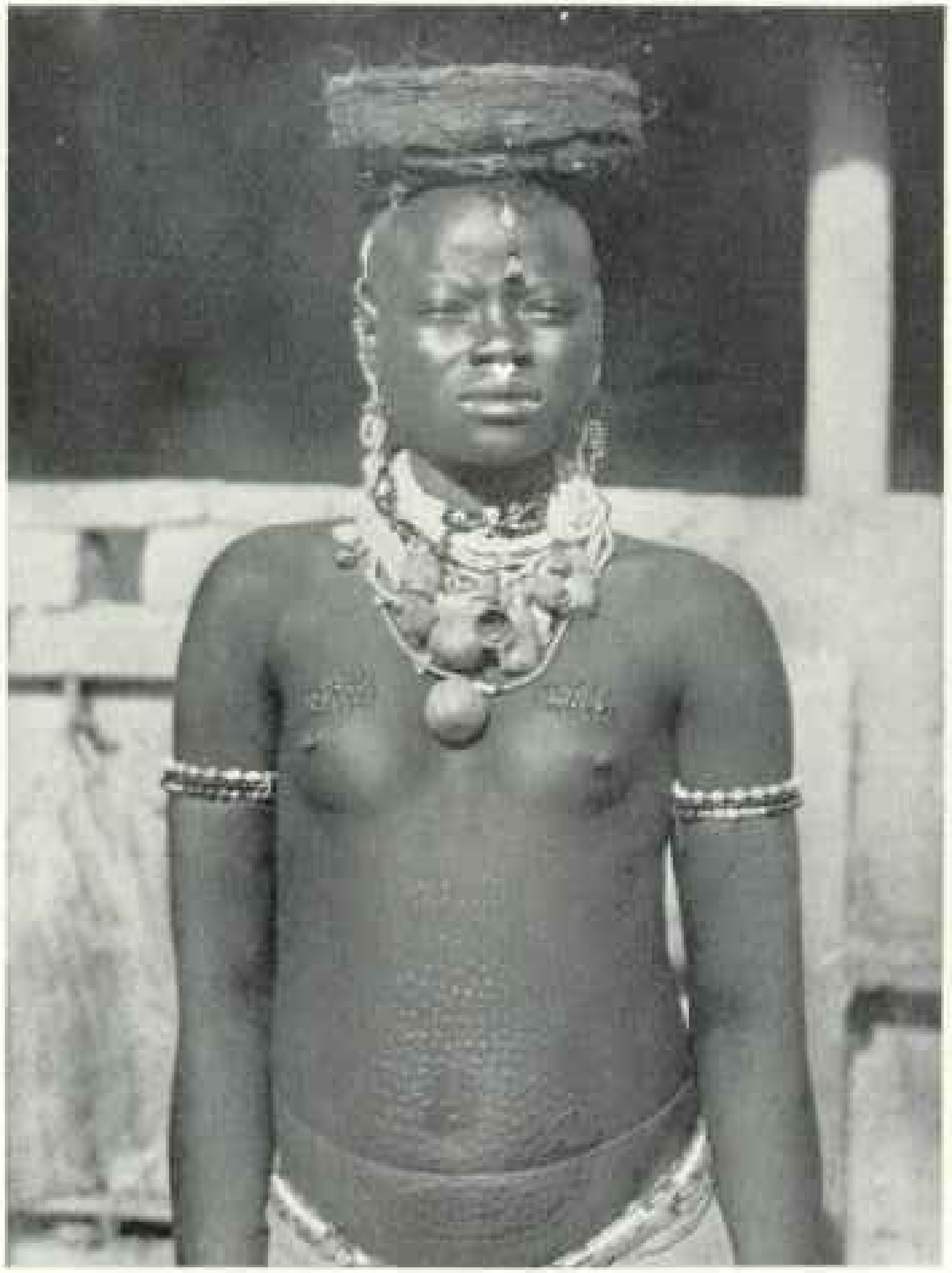
THE VILLAGE TRICKSTER TRIES TO SCARE CHILDREN

Butter-tree leaves make a foliage shirt for a Diakanké dancer, near Dioulabaya. His arms and legs are whitewashed with clay. Beads form eyeholes that permit him to see through his black cotton mask.



HER MONEY HAS GONE TO HER HEAD

This Diakanké maiden has fastened several European coins together and made them part of her fantastic coiffure. A rope of smaller coins serves as a necklace.



SCENT BOTTLES, BELLS, AND LIMES BEDECK HER THROAT

The Konlagui girl also wears several ropes of glass beads. Her body has been marked with decorative scarification, and she has a head protector of beaten bark for carrying heavy loads.

NATIVES USED THE MATERIAL AT HAND TO BUILD A SERVICEABLE BRIDGE

Matted bamboo and creepers span this stream that cuts its way through crust on the route to Touba and Koumbia. Tough plant strands make effective suspension wires, and interwoven sticks of bamboo serve for the footpath. The author stands beside Mamadou Kamarra, a Malinké, one of the military guards of the expedition.

so that no time was wasted in resting. We always located our base camps along a regular mail route, whence I could forward my husband his letters by one of our own porters.

LIFE IN KONIAGUI VILLAGES

For me the land of the Koniaguis was the high spot of our stay in Guinea. I had been looking forward to making some ethnological investigations in this little-known part of Africa, but realized that it would be no easy job.

Luck was with me the day Koline walked in and offered to act as our interpreter. For a month my husband used him as guide through the Koniagui country, and was much impressed by his intelligence. Each time they got back to Youkounkoun, my husband and Koline were on more friendly terms, and Koline gradually came to look upon me as a friend also. I knew enough about the native mind, however, not to meddle in native affairs when I was not wanted. It is worse than useless to attempt to hurry matters (see page 705).

The third and, unfortunately, last month of our stay in Koline's country I began to find out a bit about the Koniagui religion, which is directly connected with their politics and entire social organization and is replete with ceremonial and mystery. Some of their esoteric rites I was able to penetrate, but of others, such as cannibalism, I could gain only dark and indirect hints.

The women are tall, muscular, and independent, although a part of the long, arduous, and secret initiation of the youths is for the purpose of teaching the male how to keep woman in her place.

No woman is permitted to marry until she has proved her fertility by bearing at least one child. In the intervening years, after the initiation of the youths and the excision of the girls, until their marriage, promiscuity is looked upon as obligatory. After that it is a heinous offense, so that the tendency is to marry late.

We had landed in French Guinea when the landscape was still fresh and green. As the dry season progressed, the water in the creeks grew lower and muddier, and the holes lower and whiter.

The harmattan, a strong, dry wind, blew uninterruptedly for nearly a month, turning the tall grasses brown, shriveling all things made of wood, and roughening and cracking skin and lips. Vaseline and glycerine did little good, so that I was almost tempted to try the peanut grease with which the natives smeared their mouths and faces.

Finally the wind stopped, and the calm silence was intense until the bush fires

WITH GRACE SHE BEARS HER HEAD BURDEN

Balancing half an empty calabash used for carrying water, she typifies the poised dignity of young Fulah women at Mali. Independent, she prefers the modern bandanna to the elaborate native headdress (see page 708). The fence behind her was built to exclude wandering cattle and marauding beasts.

ITS SHADY CAVERN OFFERED A COOL RETREAT FOR CATTLE

Five head were found in the dark recesses of the gigantic silk-cotton tree on the way to Mali. It attains tremendous size and is supported by many buttresslike ridges. Large pods that it bears are filled with seeds surrounded by a silky fiber known to commerce as kapok, a material for mattress and pillow stuffing (see text, page 716). The seeds yield an oil used for making soap.

started. In most cases the natives deliberately set fire to the dry grasses to clear the ground for their crops. At night the glow of the distant bush burning was an impressive sight. All went well until these fires got out of hand, and then they became dangerous.

Once we were awakened by an ominous crackling a little after midnight, and my husband hurried out to help the terrified, scurrying natives try to beat down the flames and clear a fire line to prevent destruction of the whole village. A few huts on the far side were razed, but the flames did not jump the line. Had the wind sprung up again, we might not have been so lucky.

When at last the rainy season began once more, I was uncertain whether to be pleased or sorry. The heat of the long afternoons intensified, and the evening storms sprang up with rushing winds, piercing lightning, and ear-splitting thunder claps. The electricity in the air made man and beast jumpy, nervous, and irritable. During March this was especially unpleasant, for little or no rain fell to bring relief. Short downfalls became more frequent in April.

Toward the end of May we made ready to leave, since during the wet season, when the plains turn into swift-moving floods, it is impossible to study geological formations with any efficiency.

The climb up to Mali (nearly 5,000 feet), the highest point on the Fouta Djallon plateau, was steep and strenuous; but when we reached there we felt that we were back again in civilization.

THE NATIONAL GEOGRAPHIC SOCIETY'S NEW MAP OF AFRICA

By Gilbert Grosvenor

President, The National Geographic Society

AMAZING Africa is brought to members of the National Geographic Society this month in a unique and important supplement, the first map made showing in detail the highways and airplane lines of this huge awakening continent.

Under the direction of Albert H. Bumstead, Chief Cartographer of The Society, world-wide inquiry and research have been carried on for many months to compress into this map the maximum amount of up-to-date geographic information about modern Africa. No other map of that continent on a single sheet is so nearly complete. Vividly, in ten colors, it shows the vast extent of European holdings, new boundaries, and growing railroads, as well as the ever-spreading airways and automobile routes.

The Society's new map of Africa is the latest in a notable series which recently has included Europe, the United States, Asia, and the Mexico, Central America, and West Indies area. A million copies of each are published and sent as supplements to members, making these the most widely distributed of any comparable maps.

TWO MILLION PEN STROKES MAKE MOUNTAINS

The new map of Africa, like its predecessors, has been planned in a size which may be conveniently handled and referred to on wall or desk, yet large enough to include a volume of detail which may be read without straining the eyes. The scale is 185 miles to the inch.

To form the tiny hachures which indicate mountains some two million pen strokes were required.

The names of places are given in the language of the country in which they are located, but a table of geographic equivalents makes them readily comprehensible to every reader. For example, a cape is a *cabo, cap, hoek, kosa, pointe, ponta,* or *ras,* depending upon where it is situated.

Members desiring an index to the 7,162 place names on the map may obtain a copy for 25 cents by writing to The Society.

The clearness and sharpness of the lettering on The Society's maps have brought from some of the leading cartographers of Europe inquiries as to how these results are achieved. A special photo-imposing process developed by Mr. Bumstead reproduces the type of the cartographers' best hand lettering.

The first step in making a map is to draw the outlines of the area, after which it usually is customary to print the place names. By this method, however, the printed names tend to become blurred and indistinct while the cartographers are working over the map before it is ready for reproduction.

By Mr. Bumstead's method the names are not printed in ink on the master map. Instead, each letter, hand-drawn, is photographed. The negatives of these photographed letters are then formed into the place names, just as words are set up in type. A special camera next reduces the names to the desired size on a strip of photographic paper. From this the names are cut and attached to the map by a specially devised adhesive.

Every other detail in connection with the making of The Society's maps is handled with the same superlative care. The paper is made from a special formula with a view to long life and resistance to tearing.

A ROAD MAP OF AFRICA!

Special attention has been given to depicting the routes which motorists may follow in traveling in Africa. A few years ago the very idea of a road map of interior Africa would have seemed fantastic. But since the World War the construction of highways has gone forward at an astonishing rate. For valuable assistance in editing the highway information on the map, appreciation is expressed to Mr. A. Freudenberg, general secretary of the Automobile Association of South Africa, and to the Chief of the Geographic Service of the French Army.

The National Geographic Society has thousands of members in Africa. Every month more than six thousand copies of The Magazine are mailed to that continent. While the bulk of the membership is concentrated in busy South Africa, there are hundreds in Egypt, East and West Africa,

the Mediterranean coastal strip, and some even in remote parts of the interior.

How aircraft are linking Africa ever more closely with Europe, Asia, and South America is portrayed in an "Airways and Relief" inset. This feature also gives an illuminating and sometimes surprising picture of the continent's topography. For instance, there are mountains two miles high in the midst of the Sahara in the Tibesti region. Snow-capped peaks—Kenya and Ruwenzori—rise almost on the Equator, and off at the south steam the active Virunga volcanoes.

The explorer Stanley identified the Ruwenzori Range with the famous "Mountains of the Moon," vaguely mapped by Claudius Ptolemy and regarded by the ancients as the source of the Nile (see illustration, page 738).

It is easy to see from this relief map why much of West Africa, being low, is unhealthful for white persons, while a large part of the area in the same latitude to the east is much more fitted for white settlement because of its elevation. Impressive are the mountains which stretch, with few interruptions, from the Abyssinian highlands (in Ethiopia), where the Blue Nile has its source, to the Drakensberg, in South Africa. On the inset the English form of place names is used because it shows no political boundaries.

Clearly seen in the inset is that gigantic scar on the face of Mother Africa, the Great Rift Valley, extending across more than one-eighth of the circumference of the earth before it finally disappears in the Levant States. In this mammoth branching cleft, created by mighty earth movements in a distant geologic era, are cradled the Red Sea and Dead Sea and some of the world's most remarkable lakes.

AFRICA NOURISHED ANCIENT CIVILIZATIONS

More than one-fourth of the entire land surface of the globe is shown on the map, which includes large areas of Europe and Asia. Shaped like a giant question mark, or a huge, crudely chipped stone weapon, with South Africa forming the somewhat stubby handle, the continent itself contains, by careful measurements and computations made by The Society's cartographers, 11,278,750 square miles; Madagascar, nearly twice the size of the British Isles, adds 228,500.

Here in old Africa, long before the European came to unlock its secrets, flourished civilizations which have left majestic monuments.

In the land of Egypt, along the life-giving Nile, there developed a culture which created the monumental pyramids of Giza and the temples of Karnak and Luxor.* Excavations of recent years have brought out ever more clearly the heights attained by those early Africans, their craftsmanship in ebony, ivory, alabaster, and gold, their art of writing, and their explorations of the country round about (see illustrations, pages 736 and 740). Their civilization was ancient when Greece was young, and when the infant Jesus was carried down into Egypt lest He be put to death.

Farther westward in North Africa, near the site of modern Tunis, the sea-roving Phœnicians established their prosperous, ill-fated city of Carthage, whose nemesis was Rome. The level of the sea has changed and old walls have been discovered under water with the aid of aerial photographs.**

Moslems from the East came early to Africa. When Vasco da Gama rounded the Cape of Good Hope in 1497, he found Arab traders as far south as Quelimane and Mozambique, and encountered numbers of them at Zanzibar, Mombasa, and Malindi.† From these early traders and from the Moslem warriors who swept across North Africa and northward with Berber aid to conquer Spain, Arab blood found its way down into the continent and left its mark among the native blacks. Here, too, are other Semitic and Hamitic peoples whose ancestry is lost in the mists of antiquity.

At Broken Hill, Northern Rhodesia, where planes on the Cape-to-Cairo air route stop and where the National Geographic Society has several members, a Swiss miner a few years ago discovered a remarkably primitive human skull in an ancient cave beneath thick deposits of lead ore. With enormous ridges over the eyes, a marked apelike slope

* See "The Land of Egypt," by Alfred Pearce Dennis, in the NATIONAL GEOGRAPHIC MAGAZINE, March, 1926; "The Resurrection of Ancient Egypt," by James Baikie, September, 1913, and "At the Tomb of Tutankhamen," by Maynard Owen Williams, May, 1923.

** See "Ancient Carthage in the Light of Modern Exploration," in the NATIONAL GEOGRAPHIC MAGAZINE, April, 1924.

† See "Vasco da Gama: Pathfinder of the East," in the NATIONAL GEOGRAPHIC MAGAZINE, November, 1927.

to the forehead, yet a definitely human brain, it represents a distinct variety of crude prehistoric man.

In many parts of southern Africa, pictures of men and animals have been found on rocks and attributed to ancestors of the vanishing yellowish-skinned Bushmen.

At Zimbabwe, in Southern Rhodesia, are ruins left by an old and mysterious civilization which worked the gold mines of the region. From South Africa may have come the Biblical "gold of Ophir."

RICH IN NATURAL WONDERS

In Africa are natural wonders which almost challenge belief. The Sahara, a vast waste of rock, gravel, and sand, is so big it would hold the entire continental United States. The reason it is a desert at all is, simply stated, that the wind blows in the wrong direction—down from the dry heart of central Asia instead of from the moisture-giving ocean. The temperature changes so sharply at nightfall that travelers who have suffered in the blazing heat find themselves shivering under blankets.

This immense area of desolation served as a highly effective shield which long protected central Africa from overland exploration from the north.

The Zambezi River's Victoria Falls—whose native name means "Smoke That Thunders"—are almost two and a half times as high as Niagara.

Lake Tanganyika is the world's longest fresh-water lake, and near-by Lake Victoria is larger in area than any of the five Great Lakes of North America, except Superior.

The Nile is a river so long that it would reach from New York to far beyond the North Pole. The Emperor Nero sent an expedition to discover its source, but the effort failed and not until 1862 was it ascertained that the White Nile has its beginnings among the mountains and huge lakes of the Congo-Tanganyika borderland.

From the source of the Kagera, which flows into Lake Victoria and which may be regarded as the ultimate starting point, Nile River water flows about 4,000 miles before reaching the Mediterranean. Heavy seasonal rainfall at the headwaters of the Blue Nile in the mountains of Ethiopia mainly causes the annual flood which has irrigated the fields of Egypt for countless centuries. The marvelous Nile drains a million square miles.

In its long and useful flow through desert lands the Nile loses so much moisture that only a feeble stream actually reaches the sea. In fact, at low water special dams help to keep the Mediterranean from flowing into the river.

Instead of enormous pyramids erected by long-vanished monarchs, modern men, through the enterprise of the British, have built along the Nile huge dams to harness it for irrigation and power purposes. The Aswân Dam, in Egypt, impounds more than five billion tons of water.

The Congo, draining even a larger area than the Nile and flowing through the heart of the continent, provides, with its tributaries, nearly 11,000 miles of navigable waterways above Léopoldville, and its seasonal variation in volume is less than that of Africa's other great rivers. Rapids and cataracts, however, make it inaccessible to ocean steamers.

The rocky barriers characteristic of African rivers, where they plunge down from the central plateau toward the sea, long proved a tremendous obstacle to the exploration and development of the interior.

A noteworthy victim of river piracy is the Niger, which rises within 150 miles of the Atlantic, yet flows for 2,600 miles before emptying into the Gulf of Guinea. Its headwaters are raided by pirate rivers—short streams fed by heavy rainfall along the coast which cut deeper and deeper inland, year by year capturing more and more of the Niger's watershed.

From elephants and gorillas to butterflies, there is no end to the wonder of Africa's natural life, still rich, although some of the most interesting species have been decimated by thoughtless hunting (see illustrations, pages 743, and 748-750).

Besides "big game," there are termites that build "anthills" the height of a small house; driver ants, that destroy every living thing in their path; tsetse flies, whose bite gives men sleeping sickness and dooms domestic cattle to sudden death; snakes that eject their venom, aiming for the enemy's eyes to blind him; trees that store up water to tide them over the dry season.

A man-made wonder is the world's deepest gold mine, near Johannesburg, "The City Built on Gold." Down, down it goes to a depth of 8,380 feet—more than a mile and a half—in quest of the precious yellow

metal. Work was begun not long ago on an air-conditioning and cooling system for this abyssal maze of shafts and passages.*

PLANES FLY OVER CITIES, PYGMIES, PYRAMIDS

An elephant trail through the wilderness, a traffic-filled street in a bustling city, the Pyramids, modern universities, professors, pygmies, whites and blacks and every shade between, a gasoline station in the desert, a motor car's honk, a hyena's laugh—all these are modern Africa.

Over it all, the lines of transport are being constantly improved and extended, as the European powers, which control all but a tiny fraction of this continent as big as three Europes, seek to tap to the full its immense resources of mineral wealth and tropical produce.

Comfortable British air liners regularly fly mail and passengers from London to Capetown, 7,700 miles away, in nine days, while a white hunter on safari in the big-game country, with 40 blacks, takes about the same length of time to travel 150 miles. The French and Belgians are planning to blaze another long air route diagonally across the continent from the Barbary States to the Belgian Congo and far-away Madagascar.

By train one may ride from the Cape to the Congo, or across Africa from Lobito, Angola, on the west coast, to Beira, Mozambique, on the east. On a new railway bridge, one of the longest in the world, trains sweep across the broad Zambezi River at Sena, Mozambique, replacing slow, flat-bottomed ferry boats. A new 318-mile railway in French Equatorial Africa connects the Congo River system's thousands of miles of navigable waters with the sea at Pointe Noire.

9,000 MILES OF NEW RAILROADS

On the new map are shown 9,000 more miles of railroad than appeared on its predecessor issued by The Society 13 years ago—enough track to form twin ribbons of steel stretching straight through the earth and far out on either side.

Automobile routes, drawn in red, push their way down across the Sahara, previously penetrated only by caravan. Others strike through once-trackless jungles. In the dry season a motorist now may drive from the Cape to Cairo, provided he is resourceful and a good mechanic.

The purple of France covers a larger area than the color of any other nation—an empire nearly 19 times the size of the home country—but much of it consists of desert, and the lands covered by Great Britain's pink are much more populous.

Only three areas, comprising about one-fourteenth of the total of Africa, remain as separate native nations—Ethiopia, Egypt, and Liberia. The following table shows the holdings of the various countries, together with the approximate populations:

	Square Miles	*Population*
French Africa	3,982,700	33,882,657
British Africa	3,750,400	55,767,678
Belgian Africa	912,600	9,402,604
Italian Africa	900,500	2,350,454
Portuguese Africa	790,000	7,039,926
Spanish Africa	131,450	1,010,000
Egypt 373,100		
African Egypt	349,050	14,217,864
Ethiopia	424,700	5,500,000
Liberia	37,125	1,000,000
Tangier (Int. Zone)	225	51,000
	11,278,750	130,242,183

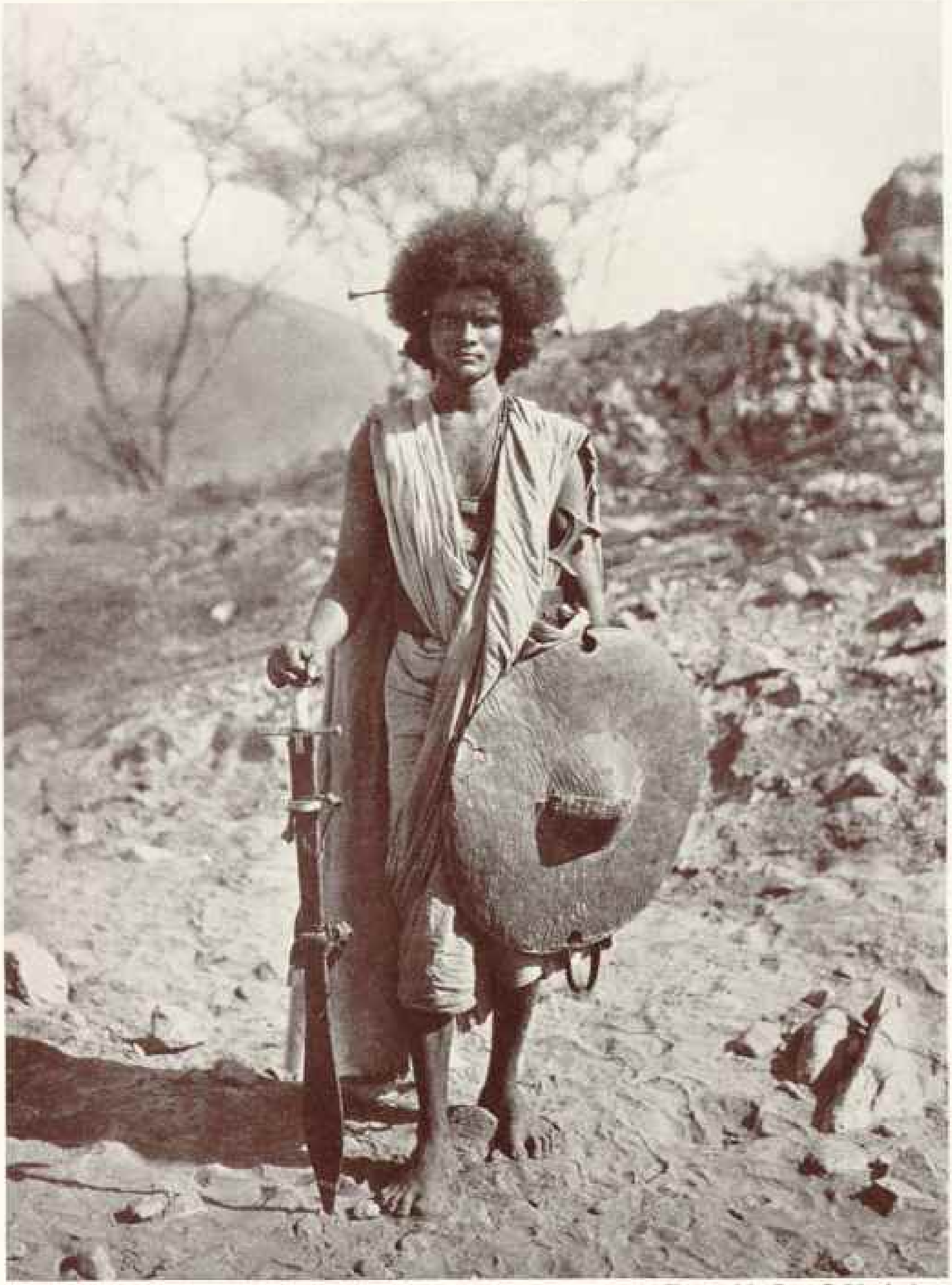
With the aid of the famous Foreign Legion, France controls some of Africa's most warlike peoples. The keynote of its policy has been to cause a minimum of disturbance of the customs of the natives. From its far-flung colonies it obtains such products as groundnuts, cotton, palm oil, fruit, cocoa, rubber, tobacco, wheat, timber, wine, and hides.

Both France and Great Britain benefited extensively from the elimination of Germany as one of the colonizers of Africa. The World War raged in many parts of this continent, and even a naval battle was fought in the heart of Africa when enterprising Britons dragged boats through the jungle and broke the German grip on Lake Tanganyika.*

A glance at the map shows how the territories of Britain have been consolidated, forming a highly important and strategic right of way from top to bottom of the continent, since the British influence is strong also in Egypt. The uniting factor in this

* See, "Under the South African Union," by Melville Chater, in the NATIONAL GEOGRAPHIC MAGAZINE, April, 1931.

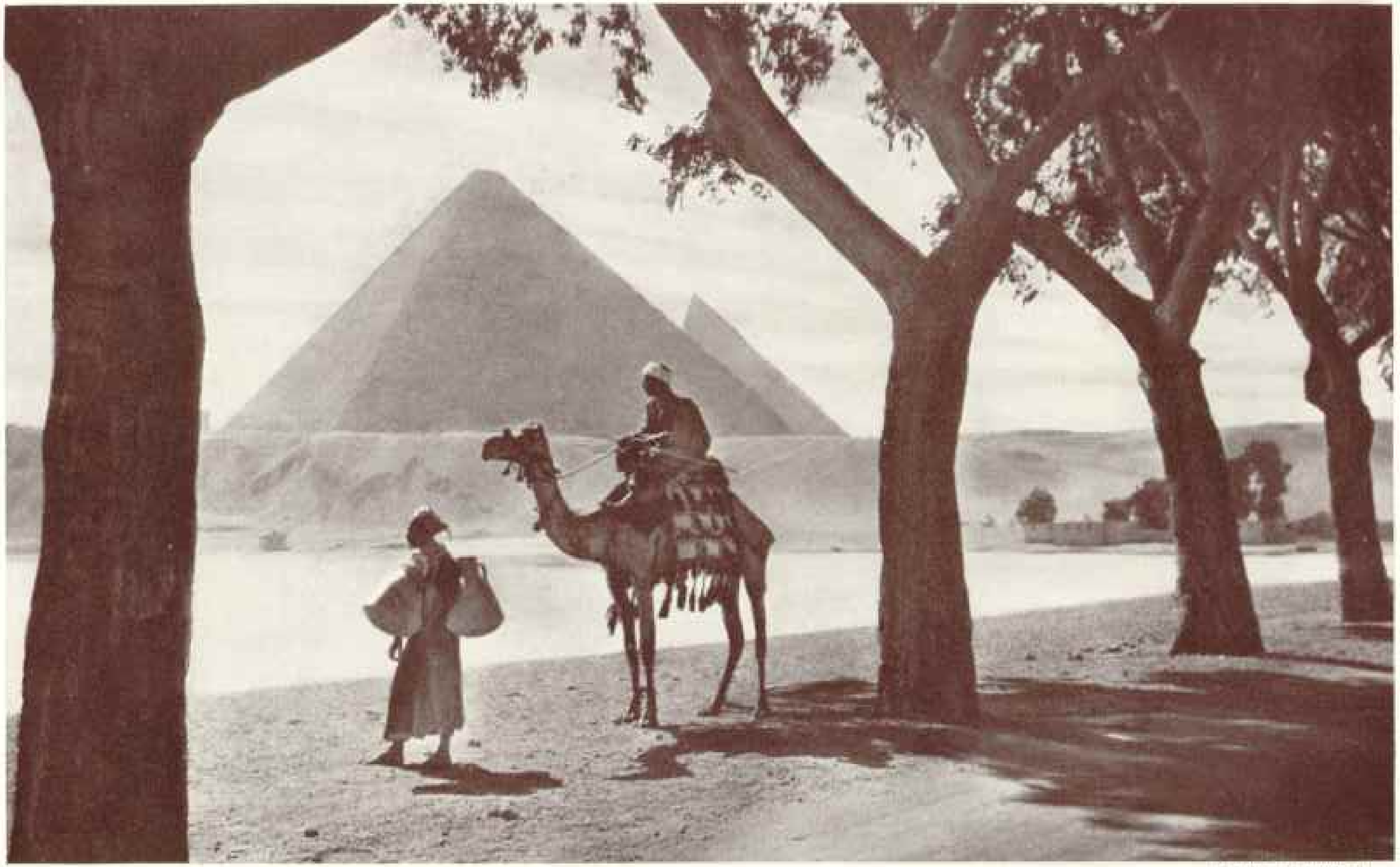
* See "Transporting a Navy Through the Jungles of Africa in War Time," by Frank J. Magee, in the NATIONAL GEOGRAPHIC MAGAZINE, October, 1922.



Photograph by Ernest B. Schoedsack

HIS HAIR BROUGHT HIM FAME WHEN KIPLING CALLED HIM FUZZY-WUZZY

British Tommies first gave the apt nickname to these fearless tribesmen of the Red Sea hills, west of Port Sudan. Nothing but death will stop their battle charge, an awesome spectacle when several hundred "big, black, boundin' beggars" join the rush, brandishing heavy swords and thick shields of elephant or rhinoceros hide. The young warrior's "'ayrick 'ead of 'air" has been soaked in sheep fat and stuck with a pin of ibex bone—used on occasion to rout out unwelcome tenants.



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THE ANCIENT PYRAMIDS OF GÎZA OVERLOOK A MODERN GOLF COURSE

Beyond the water carrier and the gaily caparisoned sight-seeing camel lie the fairways, often flooded by Nile backwater. Dominating the scene is a wonder of the world, the Great Pyramid, tomb of Cheops, which has been estimated to contain enough stone to build dwellings for 120,000 persons. Over its shoulder peers the Second Pyramid, which still wears part of the limestone covering that once protected these mighty monuments. The Third Pyramid is out of sight behind its huge comrades.

Photograph by Branson De Cou

NOTHING CAN GET HER GOAT

All the affection that a little American girl might lavish on dolls a smiling shepherdess of Gabès, Tunisia, bestows upon the pet kid of her flock. When he tires she clasps him in her arms.

Photograph by Maynard Owen Williams

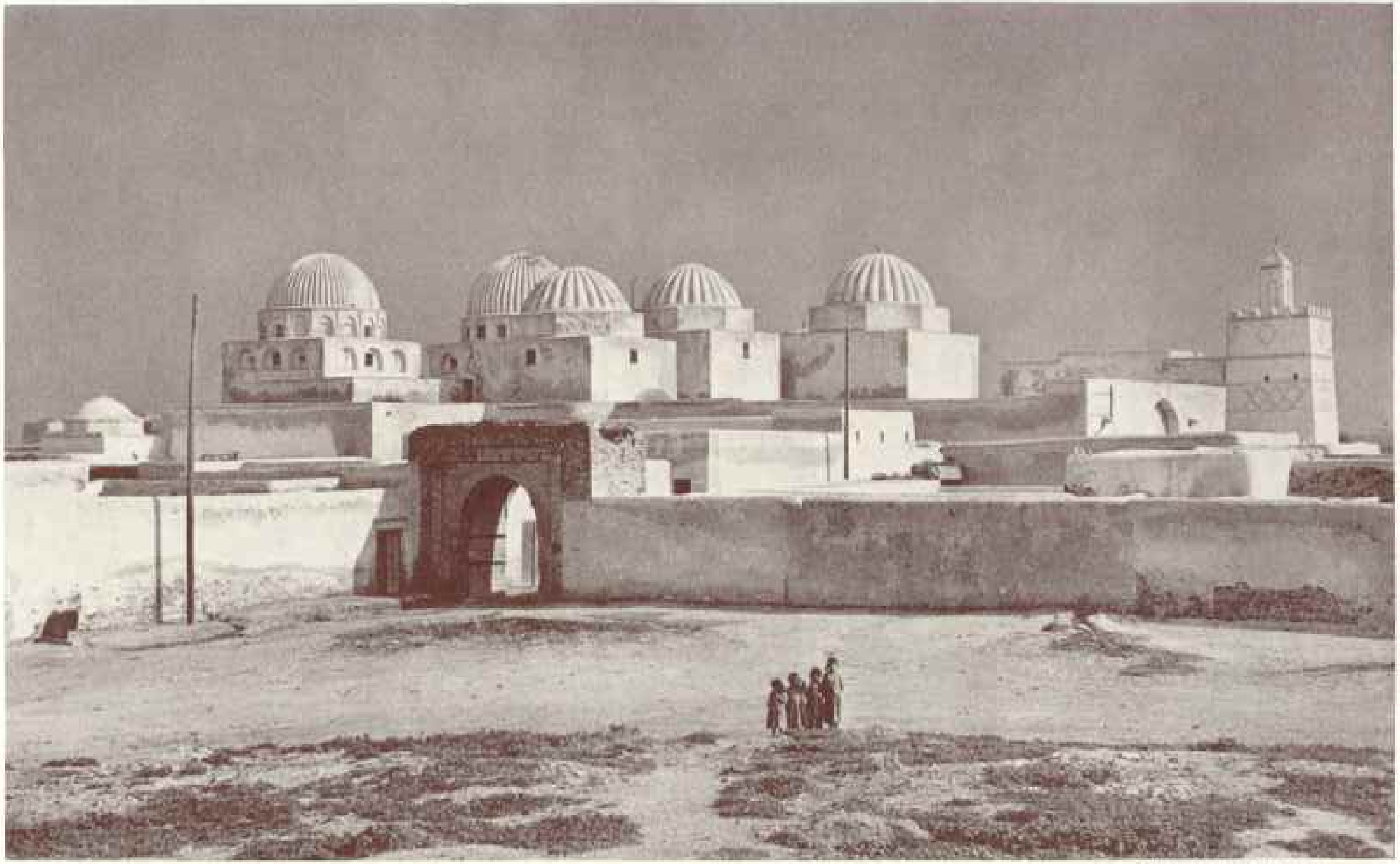
CURIOSITY CONQUERS SHYNESS

At first this bespangled daughter of teeming Constantine, Algeria, covered her face with her hands. But the mysterious doings of the photographer proved too much to resist.

Photograph by Vittorio Sella

ALMOST ON THE EQUATOR, THE SNOW-CAPPED PEAKS OF THE RUWENZORI RANGE SHOULDER THEIR WAY INTO THE CLOUDS

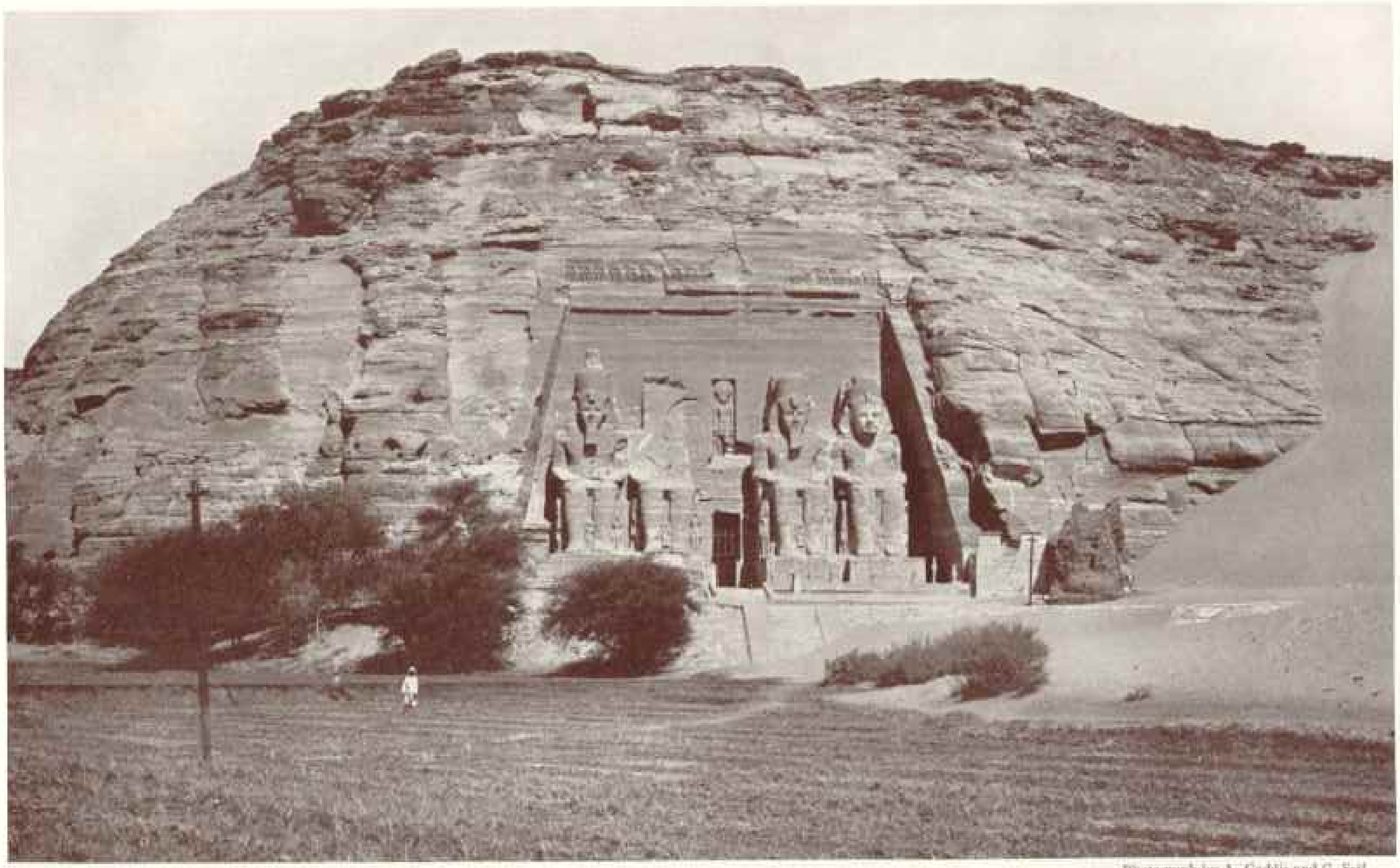
In two days one may walk from this region of Alpine temperatures to blistering, sun-baked levels on the earth's imaginary girdle. The highest pinnacles in the rugged rock pile thrust their blunt points three miles above the sea. The Ruwenzori lie in the part of Africa near where the ancients vaguely mapped a remote, mysterious range called the "Mountains of the Moon." The ridge in the distance is Mount Speke, named for the English explorer who discovered the source of the Nile.



Photograph by Martin Hürlimann

FLUTED DOMES, LIKE FANCY MOLDS, CAP THE MOSQUE OF THE SWORDS AT KAIROUAN, TUNISIA

Dedicated to a Marabout, or Moslem saint, who made huge swords in order to impress the people with his might, this house of worship rises in the western part of the holy city. The dome interiors are covered with writings from the Koran. Surrounding the city is a wall nearly 20 feet high, dotted with towers and bastions, and pierced by arched gates. Kairouan, meaning "caravan" or "resting place," was founded A. D. 670 as a center of Mohammedanism. It is said that seven visits here equal one to Mecca.



Photograph by A. Gaddis and G. Self

SOLID ROCK STATUES OF RAMESES II RECALL THE GRANDEUR OF EGYPT UNDER THE PHARAOHS

At Abu Simbil, 330 air miles up the Nile from Cairo, is this majestic monument built by the vain ruler. Spacious halls and chambers are hewn from the face of a cliff to a depth of more than a hundred feet, and the four enthroned figures—reduced by time to three and a half—rise about 65 feet high, dwarfing the native in the foreground. Over the entrance is carved the hawk-headed god Horus. Within the huge main hall stand eight 30-foot columns, each bearing the likeness of the monarch who believed it paid to advertise himself.

Photograph by Capt. C. W. R. Knight

IBIS, SACRED BIRDS OF ANCIENT EGYPT, FLASH BRIGHT COLORS IN MASS FLIGHT OVER AN ISLAND OFF SOUTHWESTERN AFRICA

A crimson patch of bare skin under the wings contrasts vividly with the black-tipped, white feathers and bare black head and neck. Legend states that when Ra, potent deity of early Egypt, left the earth, he endowed Thoth, god of wisdom and magic, with the power to send forth messengers. These were ibis, and the heronlike bird became an object of reverence among members of the Osiris cult. Its followers established a cemetery, half a mile square, at Abydos, for mummies of the gods' winged couriers.

BECHUANALAND OX JOCKEYS PREPARE TO RACE FOR A ROYAL VISITOR

Some months before Prince George of England married Princess Marina of Greece, he toured this British protectorate of South Africa. These residents of Gaberones welcomed him with festive games. Modern milliners might find inspiration in the halolike, off-the-face creations worn by the native oxmen.

Photographs from London News Agency

PRINCE GEORGE OF ENGLAND HONORS A ZULU CHIEFTAIN

Five thousand natives danced before the youngest son of the British ruler at a mammoth conference, held at Pietermaritzburg, Natal, during his visit there last year. To a Zulu leader, bedecked with leopard skins, he presents a gold-mounted cane.

Photograph from London News Agency

IT'S ANYBODY'S RACE AS THE DONKEYS CLATTER DOWN THE STRETCH

With Prince George as a distinguished spectator, Bechuanalanders, their homely quirts held high, urge long-eared mounts across the level turf at Gaberones, near the Transvaal border. The jockey on the black beast in the lead sits his steed with studied nonchalance.

© T. Alexander Barns

EVEN A 450-POUND GORILLA IS EASY PREY FOR GUNPOWDER

Natives await orders to skin the splendid male specimen. The hairy giant lived 10,000 feet above the sea on the overgrown slopes of the extinct volcano of Karisimbi, Belgian Congo. About 5 feet 4 inches tall, his chest measured 60 inches and the span of his arms was nearly 8 feet.

Photograph from London News Agency

A ROYAL SON OF ENGLAND VISITS AN OUTPOST OF EMPIRE

Two dusky urchins had front-row views as Prince George, with a cavalry escort, rode through the streets of Maseru, the capital of Basutoland, on his way to a reception at the Court House. Some natives ride Basuto ponies, renowned for sure-footedness and intelligence. The story is told that one pony refused to pass a certain spot until the traveler had dismounted and photographed a Bushman painting that the horse, after long service on the route, knew should not be overlooked.

Photograph from London News Agency

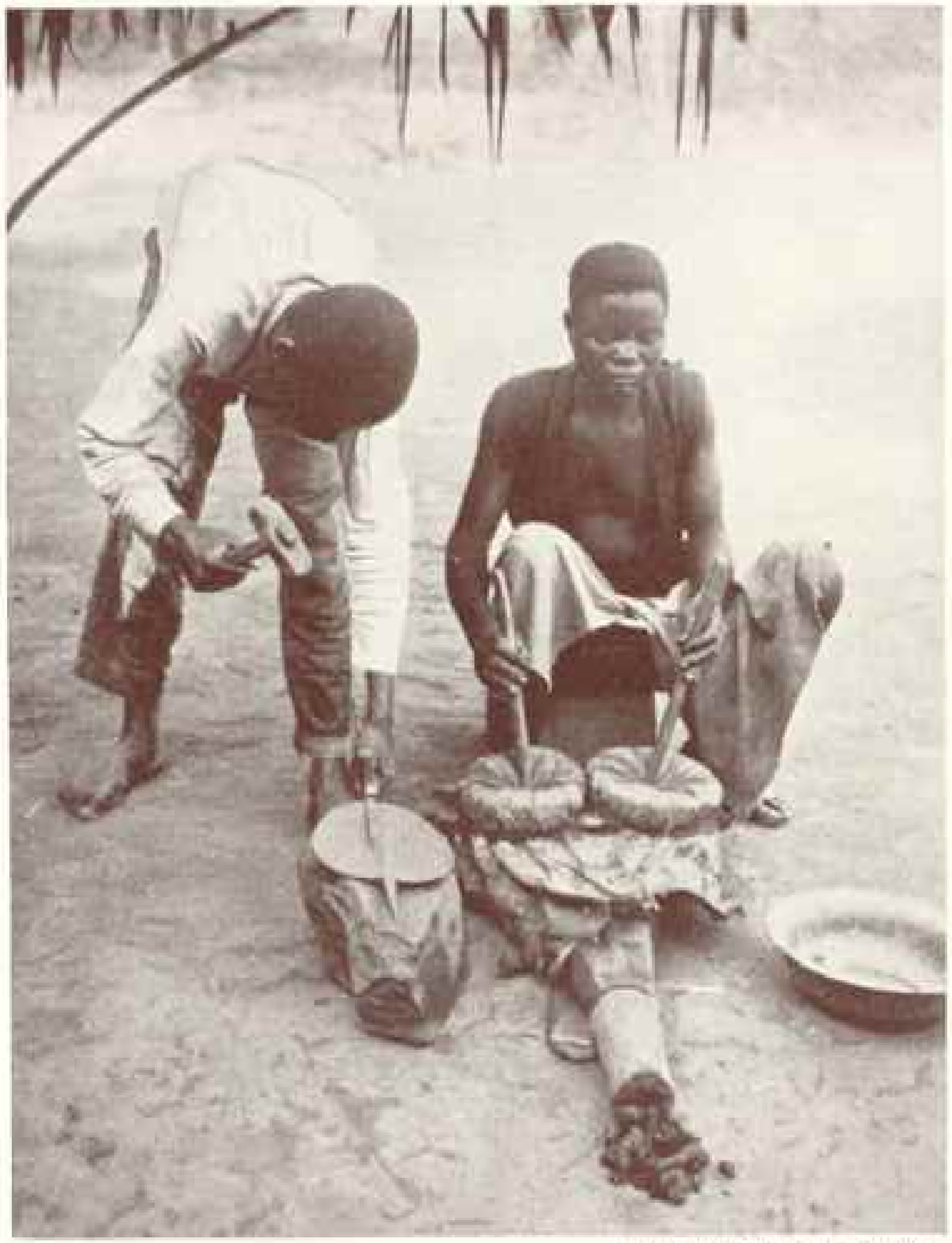
FEROCIOUS-LOOKING ZULU WARRIORS OF NATAL WAVE CLUBS, SPEARS, AND OX-HIDE SHIELDS

Effective in a hand-to-hand struggle is the *kirri*, a club of ironwood or horn with a knob the size of a man's fist on the end. But far more formidable is the assagai, a sharp, two-edged steel blade attached to a shaft more than a yard long and wielded like a bayonet. It was introduced by Chaka, a famous Zulu chieftain, to supplement the throwing of spears used for opening a fight. Another native weapon is the battle ax, a stick fitted with a thin blade which is often crescent-shaped.

Photograph courtesy South African Railways and Harbors

JAN VAN RIEBEEK LOOKS ACROSS BUSTLING CAPETOWN TO THE WHITE CLOUD BILLOWING OVER TABLE MOUNTAIN

In the circle between Adderley Street and the Promenade Pier stands this statue of the sturdy Netherlander who, with 70 colonists, founded the city near the tip of Africa in 1652. In knee breeches, frock coat, and shovel hat, he might pass for a likeness of Father Knickerbocker. In the distance at the right looms the campanile of City Hall, which contains a carillon of 37 bells. It fronts on a historic parade ground nearly a quarter of a mile long.



Photograph by Ewing Galloway

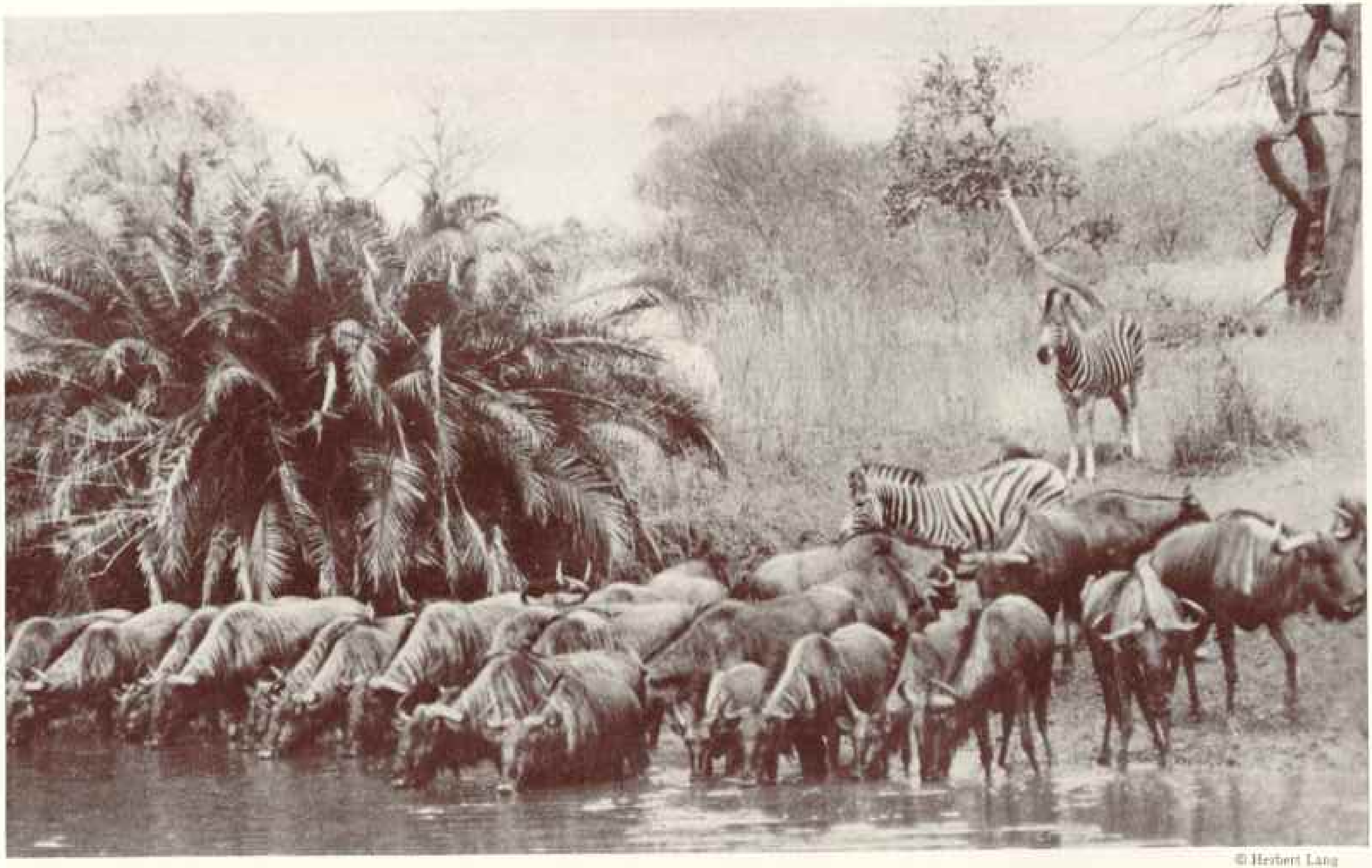
THE VILLAGE SMITHY IN ANGOLA HAS A CRUDE BELLOWS

While the smith swings his heavy hammer to fashion a knife, his apprentice pumps the air chambers that fan a pile of charcoal at the end of a pipelike blower.

Photograph from Willard Price

ANGOLA NATIVES ACQUIRE CLOTHES AND EDUCATION

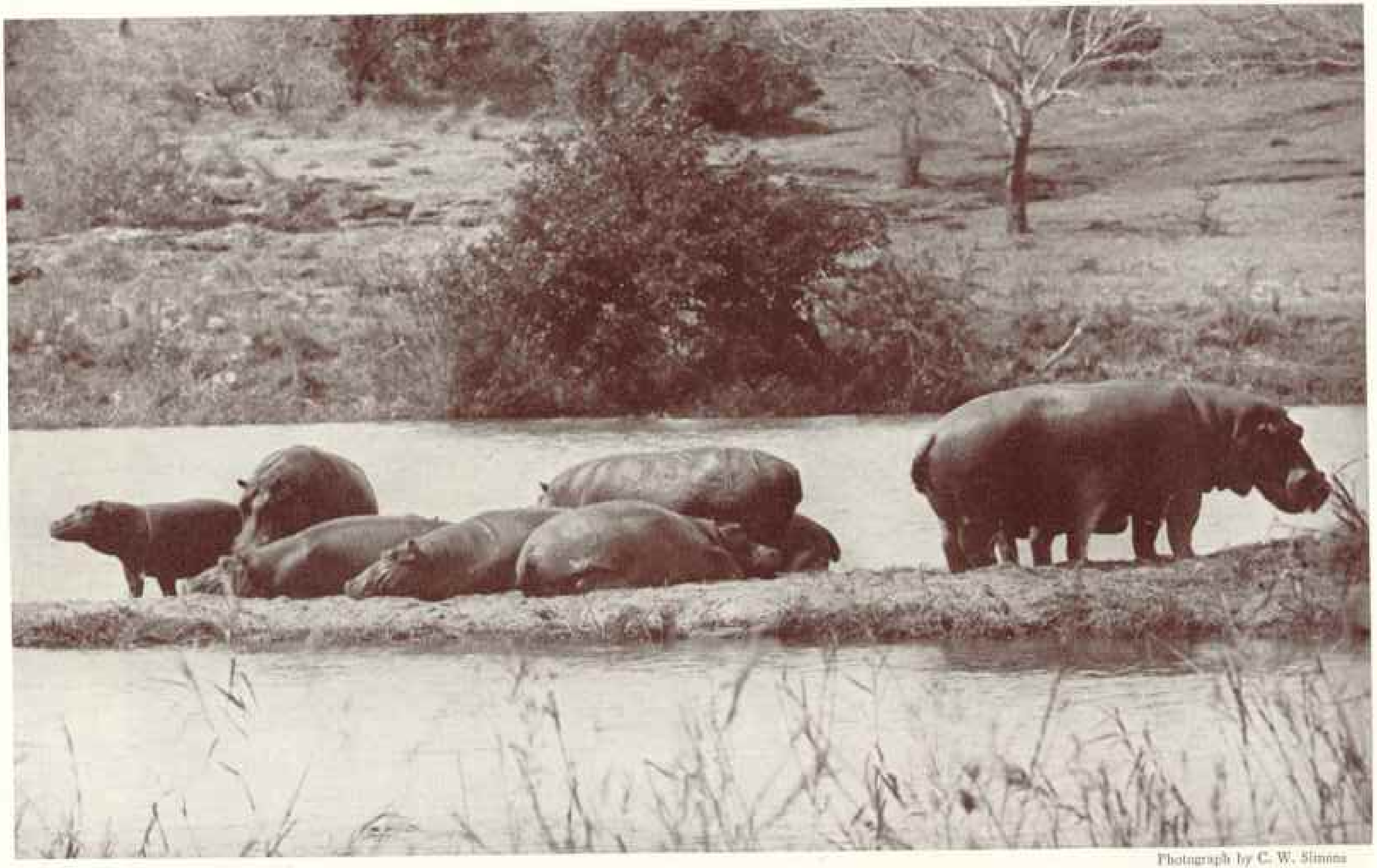
In gaily printed gowns and headbands, the pupils of this outdoor class pay strict attention as the teacher points to a chart hanging from a convenient tree.



© Herbert Lang

SHARP-HORNED GNUS CROWD OUT TWO ZEBRAS AT THE WATER HOLE

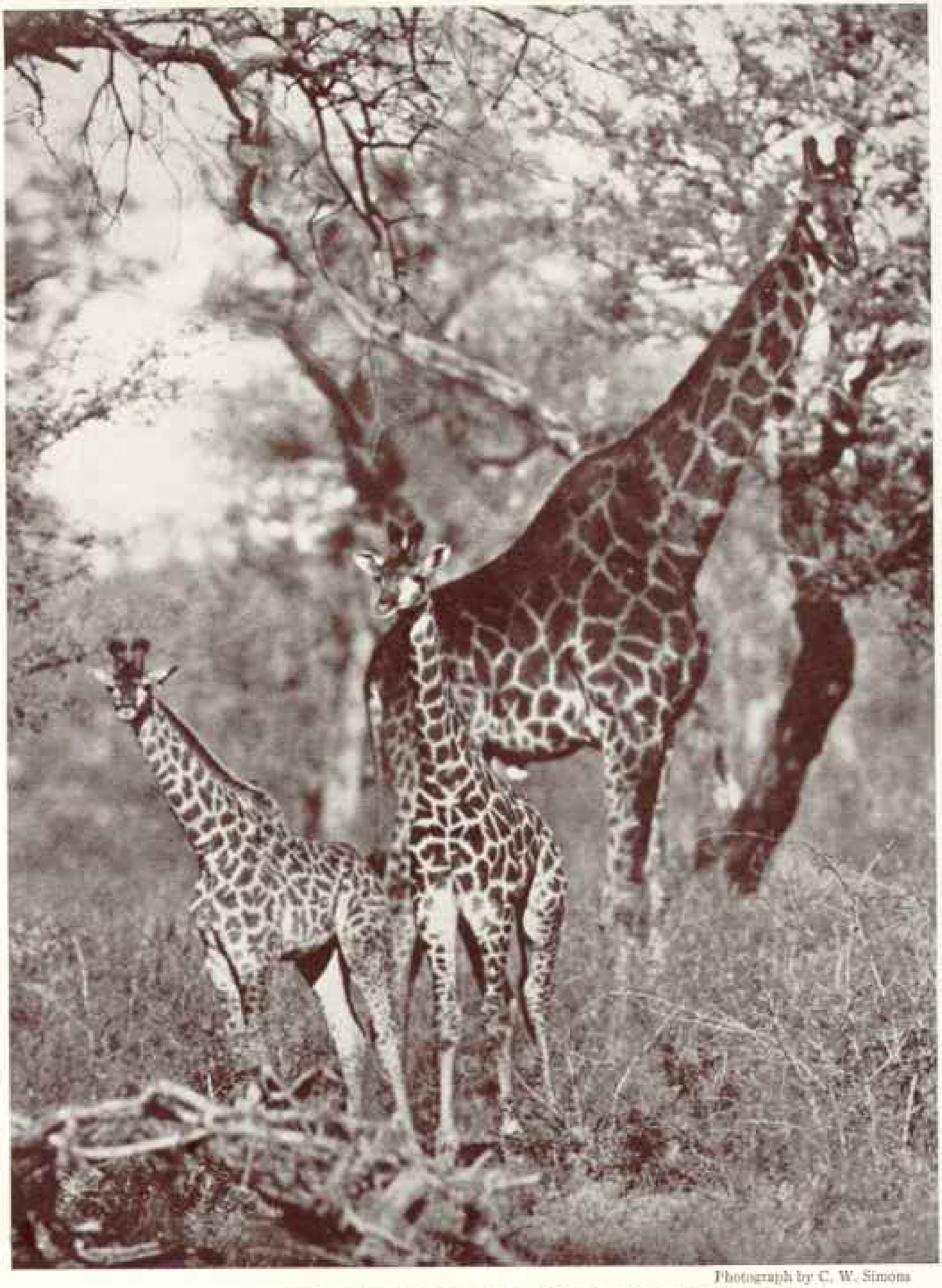
A trip through Kruger National Park, in the Province of the Transvaal, Union of South Africa, is like turning the pages of an animal picture book. The reservation's 8,000 square miles include animals of many species from elephants down, all living in the natural habitat. Gnus, or wildebeest, are particularly numerous, although their horned, weather-bleached skulls are often found, testifying that the lion has crossed their path. The park was named for Paul Kruger, four times president of the former Transvaal Republic.



Photograph by C. W. Simons

LAZY HIPPOS TAKE A MORNING SUN BATH BESIDE THE KOMATI RIVER, IN KRUGER NATIONAL PARK

Not far from the border town of Komati Poort is its chief attraction, a herd of unusually tame hippopotamuses. Long sheltered from the huntsman's rifle, they no longer fear man, and remain wholly unperturbed by the crowds of visitors that often throng the river bank to watch their piglike behavior.



Photograph by C. W. Simons

TALLEST OF LIVING MAMMALS IS THE ALMOST INCREDIBLE GIRAFFE

They sometimes reach a height of more than 18 feet, and even the babies look down on a man. These long-necked inhabitants of Kruger National Park pick off choice morsels among the branches of trees, and a long, flexible tongue gives added reach. But to drink or graze off the ground they must spread their fore-legs. Long-legged and fleet, they often escape from lions by galloping off at a speed estimated at thirty miles an hour.

string of possessions was Tanganyika, formerly German East Africa.

GOLD AND DIAMONDS HELPED BUILD SOUTH AFRICA

The British, in possession of some of the richest areas of the continent, have been tireless in their development. In South Africa, gold and diamonds have played major rôles. On the Nile, irrigation projects have proved successful, and quantities of cotton are produced in the Anglo-Egyptian Sudan and Uganda. Kenya is growing large quantities of coffee and the West African possessions yield tropic products, such as oil palm nuts, cocoa, copra, and groundnuts: tiny Gambia alone ships more than a million dollars' worth of peanuts a year. The British islands of Zanzibar and Pemba yield the bulk of the world's supply of cloves.

In the Uganda-Kenya-Tanganyika area —the heart of the big-game region—Great Britain holds a section which, because of its generally high altitude, is much better adapted to European colonization than the rest of equatorial Africa.

Belgium, third on the list of African landholders, possesses in the Belgian Congo untold resources of minerals and tropical produce, including palm oil, rubber, rice, ivory, cotton, cocoa, and coffee. What gold and diamonds have been to South Africa, copper promises for the Congo, and much of the rapid development that has taken place there has been aimed at tapping the rich deposits of the metal.

ITALY'S AFRICAN EMPIRE GROWS

The African possessions of Italy have recently been extended by cessions from Great Britain and France, and portrayal of these new frontiers is a major change from previous maps.

From France, Italian Libia received along its southern border in the Tibesti region a 45,000-square-mile slice of desert land, a territory nearly as large as New York State.

Another French cession extends the Eritrean border 12 miles farther to the southeastward along the Strait of Bab el Mandeb, a strategic bottle-neck.

From the Anglo-Egyptian Sudan, Italian Libia gained at its southeast corner 36,700 square miles, an area slightly larger than Indiana. Water is worth more than gold in this region, and the most important spots in the whole ceded territory, located just beyond the northwest tip of the Anglo-Egyptian Sudan, are two wells—Ain Zueia and Ain Daua. "Ain" means "well" in Arabic.

Portugal, whose bold navigators in the Age of Discovery were the first to outline the southern shores of this continent, ranks fifth in extent of African lands, and these territories, while potentially rich, are largely undeveloped. Spain's African possessions, like those of Italy, contain a large proportion of desolate land.

Egypt, "the gift of the Nile," would be as barren as the rest of the Sahara were it not for the comparatively narrow strip where the river, annually overflowing, irrigates about 12,000 square miles of a total area of 373,100. There, on little more than 3 per cent of the country's surface, live practically all of its 14,000,000 people.

ETHIOPIA GUARDS ITS RICHES

Rich, undeveloped Ethiopia has remained independent, partly because of the courageous, warlike nature of its people and partly because of its many mountains. The country is a natural fortress. In its rugged hills and valleys the existence of considerable mineral wealth has been reported recently, but lack of transportation facilities has prevented its development.

Particular importance attaches to the "Somaliland Horn" region because of the recent controversies between the Ethiopians and the Italians over the Ethiopia-Italian Somaliland border. Nearly 40 years ago the two nations fixed the frontier at "about 180 miles from the coast," and this vague boundary has often caused dispute. The native empire, harborless, has Italian neighbors on two sides.

In Africa's third native nation, Liberia, the United States takes a particular interest because of the part this country played in establishing that republic as a haven for freed Negroes a century ago. Its products are those of tropical agriculture, including rubber from American-owned plantations.

NATIVES OUTNUMBER WHITES 35 TO 1

For labor in developing the continent, particularly West and Central Africa, the white man has found himself largely dependent on the Negro, who has built up resistance to the diseases and to the effect of tropical sunlight, and lives with im-

punity in regions where the white man cannot yet survive without periodic vacations.

The white population in general is readily zoned—along the Mediterranean, in the far south, and now a white penetration into Central Africa, particularly in the equatorial but elevated Kenya-Tanganyika region.

In Africa as a whole the whites are outnumbered about 35 to 1. The natives include a wide variety of peoples and tribes, ranging from the tall, slim blacks found in parts of the Sudan to the tiny, childlike four-and-a-half-foot pygmies of the central forests. Some remote tribes are just emerging from cannibalism and all are encountering a civilization which demands a drastic revision of all their modes of life (see illustrations, pages 735, 737, and 745). Adding to the miscellany are thousands of East Indian immigrants.

In religion, as well as race, Africa is a gigantic mixing pot, with many of its dark millions still pagan, although the Crescent and the Cross have been making converts for generations. Mohammedanism was brought to Africa by the sword 13 centuries ago, and it has been estimated that 60,000,000 of the continent's inhabitants—nearly half—are followers of the Prophet.

PLACE NAMES HINT THRILLING HISTORY

African place names tell an eloquent story. Sturdy Netherlanders, like those who bought Manhattan Island from the Indians, first settled South Africa and fought the swarming Zulus, as many a name reminds us. The meaning of Weenen, for instance, is "weeping." Bulawayo in the Zulu tongue means "Place of the Killing." Pretoria takes its name from Andries Pretorius, who crushed the Zulu king's 10,000 black warriors at the battle of Blood River a little less than a hundred years ago.

Portuguese names call to mind the mariners of King John and Prince Henry the Navigator, and particularly the iron-willed, devout Vasco da Gama. Natal he named for the Natal Day of the Savior when he sighted its shores on Christmas, 1497. Batholomew Diaz called the newly discovered promontory near the southern tip of the continent the Cape of Storms, but his monarch, foreseeing success in reaching the East, changed it to the Cape of Good Hope. Bojador, Verde, Palmas—all are survivals from the Age of Discovery.

Gold Coast, Ivory Coast, Slave Coast—what a story the stark words on the map seem to tell of sea-rovers in dark and rakish windjammers! From West Africa as slaves, stowed "spoon-fashion" in tiers between decks, came the ancestors of twelve million present-day Negroes of the United States.

The name Sudan comes from the early Arab term, "Bilad es Sudan," meaning "Land of the Blacks."

At Ujiji, on Lake Tanganyika, Dr. Livingstone was found by Stanley in 1871, and near the southern shore of Lake Bangweulu, in Northern Rhodesia, the famous missionary-explorer died. At Busa, on the Niger, are the rapids at which Mungo Park was drowned. From Bathurst, on the western "bulge" of Africa, the Lindberghs took off for South America in their flight around the North Atlantic in 1933.

A way point in Algeria is named Bidon 5. "Bidon" in French means "can," or "gasoline tank."

There are geography catch-questions in Africa, too. For example, what is the continent's southernmost point? The answer is not the Cape of Good Hope, but Cape Agulhas, as the map shows. What is the Sahara Desert? The use of the two words in conjunction is a misnomer. "Sahara" means "Great Desert."

Keeping abreast of changing geography, the map shows Northern Rhodesia's new capital, Lusaka instead of Livingstone. Nova Lisboa (Huambo) is being made the capital of Angola, replacing Luanda. Upper Volta, in French West Africa, has been divided for economy between three other colonies—the Ivory Coast, French Sudan, and Niger. There are new political subdivisions in the Belgian Congo and Anglo-Egyptian Sudan.

In the tip of Asia that is visible Persia bears its newly adopted name, Iran. Syria has become the Levant States.

In the southern part of the Turkish Peninsula is Musa Dagi, scene of events in a recent novel, "The Forty Days of Musa Dagh."

For members of The Society, the map, with its modern features and clear cartography, compresses into 900 square inches a volume of geographic knowledge, and affords assistance in following the development of the world's second largest continent in an epoch when world powers are seeking access to its wealth of raw materials which are essential to modern industry.

RHODESIA, THE PIONEER COLONY

In the Land of Sheba's Gold and Rhodes' Diamonds Emerge Model Towns and Modern Mines

By Melville Chater

Author of "Under the South African Union," "Ohio, the Gateway State," "Skirting the Shores of Sunrise," etc., in the National Geographic Magazine

IMAGINE yourself aboard a certain north-bound limited train, on an overnight journey amid such civilized comforts as you might expect to find on a similar journey, say, from London to Edinburgh. What, then, is flitting past your close-shuttered windows—what tall-chimneyed industrial areas, or Old-World suburbs of primly hedged homes?

None whatever! Next morning you will awake on this particular north-bound limited, to find only the bare South African veld. Except for far-separated railway stations, or some isolated settlers in their corrugated-iron house, the land seems as virgin as were America's plains a century ago.

Were we still in Bechuanaland? Just then along came Erbsmith. He was our exceedingly versatile English courier, who had "dabbled" in many vocations in many lands.

I have heard Erbsmith say, as if uttering a mere commonplace, "It was while I was building a garage that Alf asked me to doctor 'is 'orse, which I couldn't, as I'd promised to stuff Bill's lion after doing some odds and ends in plumbing, watch-repairing, and so forth, and putting the church pipe organ in order."

Fate had tried to conceal him by calling him Smith, but he always ran that and his first name, Herbert, into one mouthful.

A BOUNTY FOR CROCODILES

"Erbsmith, sir!" announced the voice; then our compartment door opened. "We've been in Rhodesia ever since crossing that branch of the Limpopo. The great, gray, green, greasy Limpopo, did you say, sir? Well, I really can't say as to that, but it's got a very crocodilish look, which gave me the idea of dabbling in crocodiles—a nursery, you know."

"Raising crocodiles!" I ejaculated. "Exterminating them, you must mean. Don't some South African governments offer a bonus for every crocodile's head sent in?"

"That's just it, sir," returned Erbsmith. "One pound per 'ead. 'Ence, why not a crocodile nursery?"

He went off to order tea, while we began accustoming ourselves to the outskirts of Rhodesia's wide, thinly settled spaces.

The two Rhodesias, of which the Northern colony is almost double the size of the Southern, contain about two and a half million Bantus and but 61,000 persons of European descent. And over what an expanse are these few scattered! One might roughly compare the area of the Rhodesias with that of the thirteen States, or parts of States, lying south of Pennsylvania, east of the Ohio and Mississippi Rivers, eastward along the Gulf of Mexico, and north of a hypothetical line running through central Florida.

Picture the above region as being occupied by a population only nine times that of Atlanta, Georgia—a population wherein the Bantu and white races are proportioned at 40 to 1. Consider, along with that, a civilization only four decades old, and you have the basic elements of Rhodesia, the pioneer colony.

TELEGRAPH AND TOM-TOM

Pioneer? Yes, but with a difference. For the covered wagon and log hut of a century ago have been replaced by the vestibuled train, the motor car, and the home luxuries of today. The homespun stocking of 1835 would blush before the diaphanous affair of 1935. And so it is quite in the picture that the Rhodesias should repeatedly exhibit the whole range of civilized town life along thoroughfares whose telegraph poles go trailing off into a raw veld as primitive as tribal tom-toms.

Here, for example, is Bulawayo, a town of some 31,000 people, including its suburbs, of whom two-fifths are Europeans (see page 756). Along its wide streets or in its suburbs you are confronted by fine public buildings and residences, and by those invariable clubs, parks, sports

Photograph from Mrs. J. McKeurtan

ON THIS SITE OF HIS GRAVE, CECIL RHODES, SOME TIME BEFORE HIS DEATH, LAY DOWN TO "SEE HOW IT FELT"

Historic Matopo Hills, just south of Bulawayo, form a range about 70 miles long and 30 broad; with its many caves it was a retreat for warlike Matabeles. Toward the end of his life the "Empire Builder" lived here, in a simple native hut. Speaking Matabele, he held many conferences in this region with chiefs and medicine men. In the background is the Allan Wilson Memorial, commemorating the gallant fight of 1893 in which Major Wilson and his little band lost their lives to Matabele warriors.

grounds, and trim hedges that, as it almost seems, the British colonist packs aboard a boat in England and unpacks in his adopted land. Here, too, are the administrative headquarters for the Rhodesias' 2,000 miles of railway.

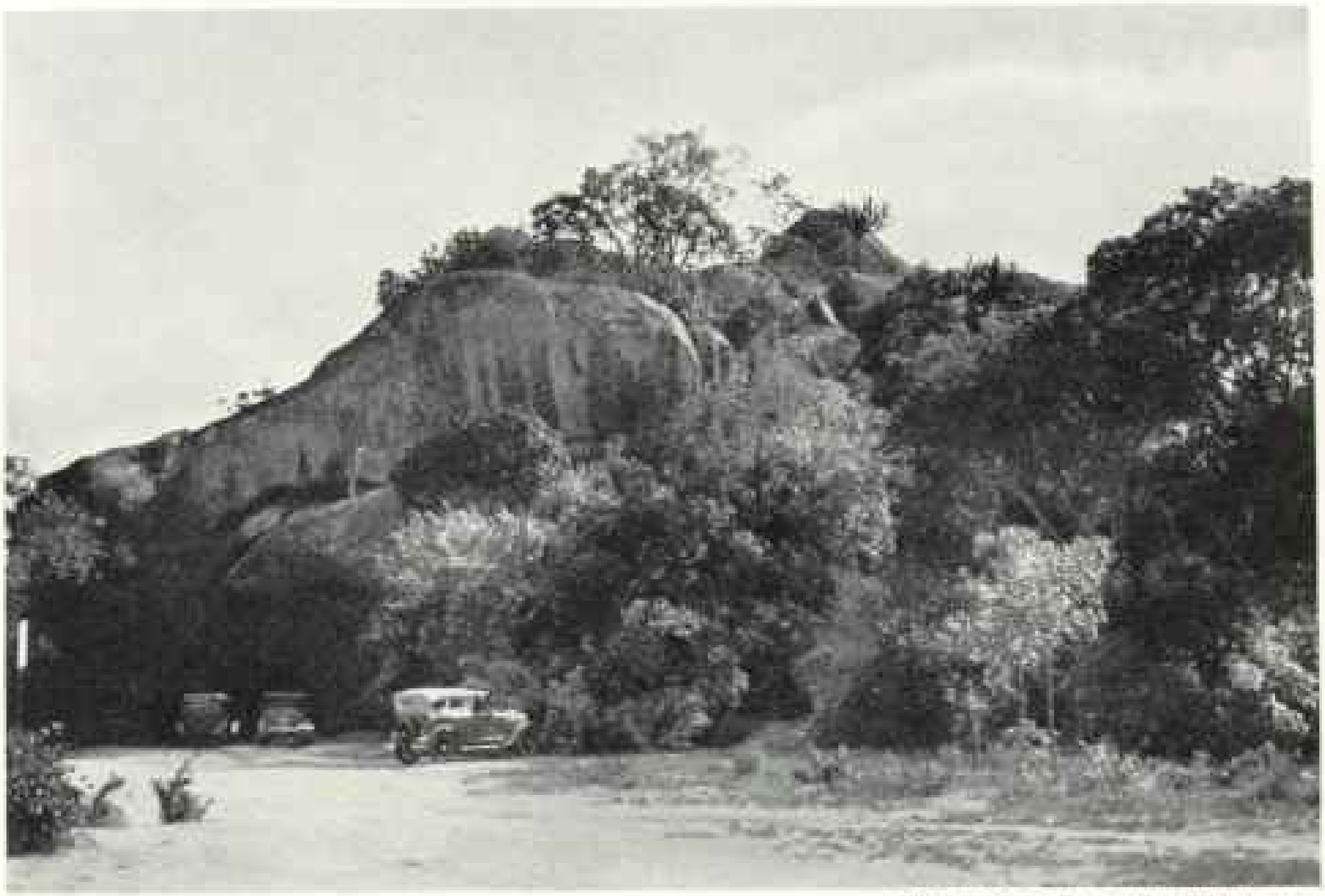
And yet, with all these aspects of a well-settled development, Bulawayo is but 42 years removed from its beginnings on the site of a ruined kraal whose name, meaning "Place of the Killing," it bears.

Although distinctively a latter-day town, Bulawayo has its antiquities. It was at the near-by Khami ruins that we struck the confused trail of the land's ancient miners. There, wandering among its bleared mounds and splayed walls, you pick up a fragment of dried earth. You crumble it, and, lo, a grain of gold glints in your palm! In fact, a pennyweight or so of gold per ton of earth remains in some of Khami's mounds, representing the spillings from primitive crucibles.

What of Khami's two square miles of ruins? Who were the builders of these and other works that, still represented by multitudes of more or less similar ruins, dot Southern Rhodesia? We know that Zambezia, to give it its older name, is mentioned in early Arabian records as a gold-producing region, and that the 16th-century Portuguese undertook gold-seeking expeditions thither. Yet, up to the present, conflicting opinions attribute Rhodesia's ruins to widely divergent epochs and races. Indeed, the one indigenous people who are distinctly ruled out of court are Rhodesia's aborigines, the Bushmen.

THE ART OF THE BUSHMEN

For it was not architecture but art that busied the little Bushman's brain. He outdid all modern, attic-occupying Bohemians, since for him a mere cave was good enough so long as he could paint his pictures (see page 760). Ever since remote times he



Photograph by Capt. Allan Whittington

IN CECIL RHODES' LAST WILL HE ASKED TO BE BURIED ON THIS HILLTOP NEAR BULAWAYO

"I admire the grandeur and loneliness of the Matopos," he wrote. "I desire to be buried . . . on the hill which I used to visit and which I called the 'View of the World' . . . covered with a plain brass plate . . . 'Here Lie the Remains of Cecil John Rhodes.'"

and his practically untribalized packs of fellow hunters had been wandering over that vast Zambezian area which early Portuguese records so appropriately named "The Land of the Little People."

Armed with bow and arrow, horn paint pot and feather brush, these dwarfish folk roamed care free, now killing game, now colorfully depicting their exploits on cave walls. Happy Bushman, dabbling in "art for art's sake," with no public to consider and no critics around!

But, about 700 A. D., there crept over this Golden Age the cloud, the very black cloud, of Bantu invaders from the north. Before those terrifying hordes of "The People," for such is the root-meaning of Abantu, the little Bushmen scattered, fleeing southward.

Thereafter the Makaranga (Makalanga), one of the conquering tribes, ruled the land under a series of kings styled the Mono-mutapa. Theirs was the realm of "Monomotapa" that figured in Portugal's legends as an African El Dorado, and brought Portuguese explorers to their ruin. But in the 17th century this long-lived régime disintegrated into the smaller tribal regions of Matabeleland and Mashonaland, areas now comprised in Southern Rhodesia.

Save for reports of the Zambezian wanderings of David Livingstone in 1851, those regions remained little known to the outside world until about 1890.

There still stands near Bulawayo the large *Indaba* (conference) Tree where, in 1888, King Lobengula of the Matabele discussed the terms on which he conceded to Rhodes' agents mineral rights in Mashonaland. Two years later a pioneer column, sent in by the great imperialist, had occupied for a reluctant empire a territory between three and four times the size of Great Britain and Ireland combined.

FROM DEATH TO DIAMONDS

A pioneer country's memorials are usually natural features. Rhodesia has its Indaba Tree and its Matopo Hills. But the most curious extant spectacle associated with Rhodes is that deserted, craterlike pit at the Kimberley diamond mines, where

Photograph by Stuart & Copley, Ltd.

ARMISTICE DAY CROWDS THRONG BULAWAYO'S MAIN STREET TO WATCH A PARADE OF RHODESIAN TROOPS

Just behind the battalion is a monument to Cecil Rhodes. Bulawayo, built on the site of a ruined kraal, means "Place of the Killing," and is now the headquarters of the Rhodesia Railways (see text, page 755).

Photograph by Union of South Africa Air Force

THESE ANCIENT STONE WORKS IN THE ZIMBABWE "VALLEY OF RUINS" HAVE BAFFLED STUDENTS FOR YEARS

This probably was a place of worship; forts and other near-by strongholds may have been connected with gold mining, which has been carried on here since remote antiquity (see text, page 770). Portuguese and Dutch writers associate these ruins with King Solomon and Sheba; here Sir Rider Haggard laid the scenes of some of his romances. The circumference of the outer temple wall is 830 feet (see illustration, page 759).

Photograph by Lorette C. Chafer

PEDDLING HIS WARES AT THE FRONT GATE, AS DID TRADER HORN

White conquest has brought peaceful pursuits to the once warlike Bantu. This same tall, lean type of man once formed the regiments of that terrible Zulu warrior, King Chaka.

he began digging the fortune which made possible his future colonizing schemes.

Picture Kimberley in the 1870's. Atop a bucket, alongside the checkerboard pattern of claims, sits a big, rumple-haired, slackly garbed English youth, staring into vacancy. In him Natal has lost a cotton grower, and the world will one day gain—to put it thus, since his name is Rhodes—a Colossus.

The English doctors gave this young Cecil John Rhodes a year or so to live, but the South African climate has saved him. From death to diamonds, and from them to vast wealth, South African statesmanship, and empire-building—such will be the swiftly ascended rungs during a life that will end at 49 years.

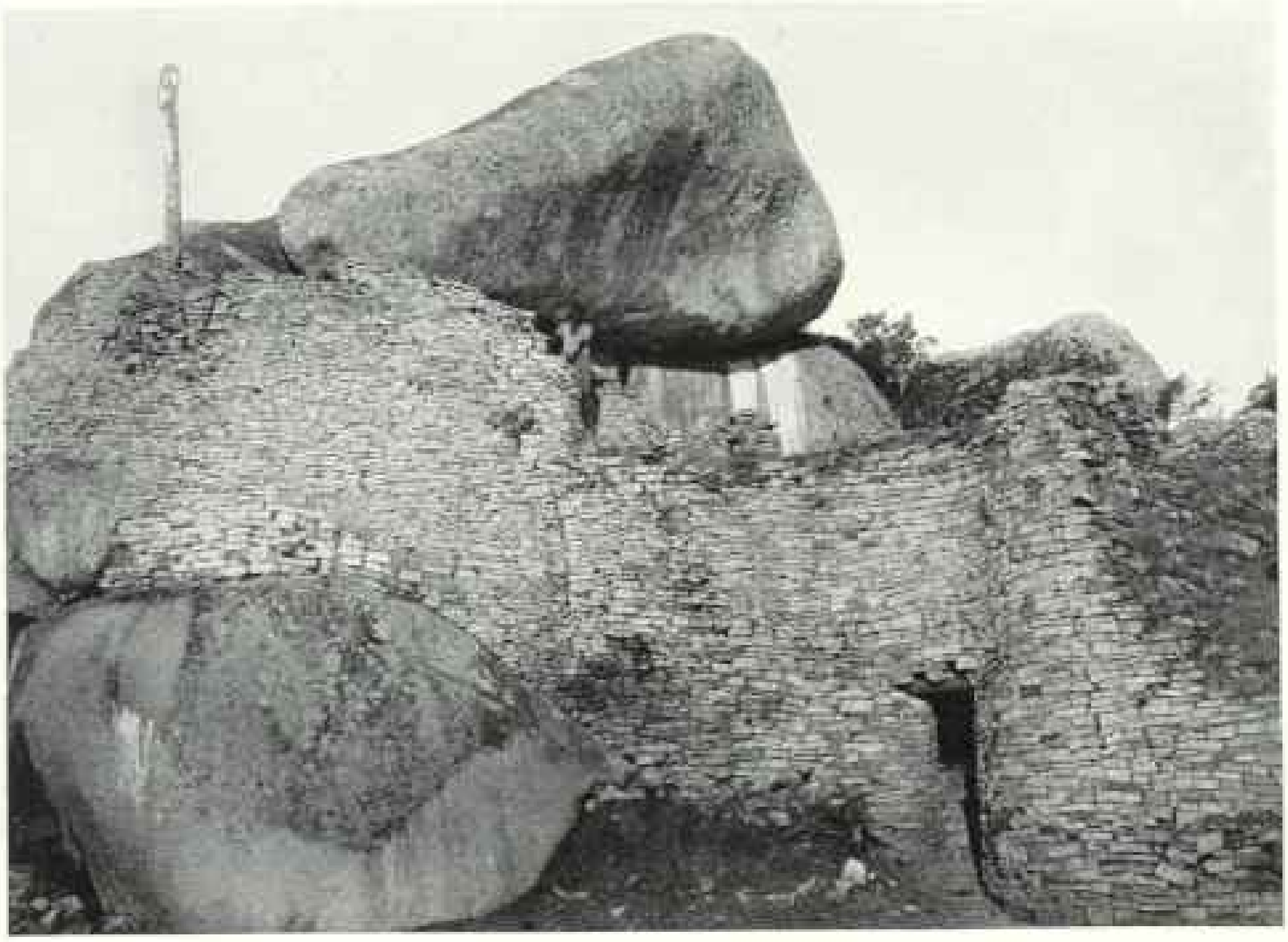
Meanwhile he dreams—he is an incorrigible dreamer. Presently he will be making wills, based on some future, chimerical wealth, to the end of extending the British Empire so vastly as to "render wars impossible and promote the best interests of humanity."

Did ever an unknown young man express with such imperturbable race pride so colossal and impersonal an aim? Yet such, with modifications of riper thought, will be his life's task. To it he will bring titanic energy, indifference to domestic ties, intolerance for those who cannot transform dream into deed, and scorn for mere wealth disassociated from the community's interests. And so, while gaining great fortunes with one hand, he will disburse them among provinces and peoples with the other.

Past him, as he sits there, deep in thought, scurries a young Jew, late of London, who arrived on the diamond fields with no more capital than 60 boxes of questionable cigars. It will be but 17 years before Rhodes and his group will buy out this Barney Barnato and his group, thus establishing a South African diamond monopoly.

And there you have it all—the man, the money, the motive. And meanwhile, with a copy of Aristotle in his pocket—Aristotle who wrote concerning the highest object worthy the highest activity of the soul—there he sits on his old mine bucket, dreaming.

To catch model towns in the act of being born amid primal forests is the experience awaiting anyone who will go upward of a thousand miles north of the Limpopo to where the Belgian Congo abuts on Northern



THE WESTERN TEMPLE AND PLATFORM OF THE MYSTERY RUINS AT ZIMBABWE

Perched on Zimbabwe Hill, towering high above the Elliptical Temple in this "Valley of Ruins" (see page 757), the Acropolis challenges the imagination of military engineers. Before the days of big guns it must have been impregnable. Judge its mass by the man's figure under the bowlder!

Rhodesia's developing copper mines. In our case this meant two days and nights of train travel from Bulawayo, with sheer bushland whirling past hour after hour.

ERBSMITH—AND AN ELEPHANT

Meanwhile, Erbsmith regaled us with yarns gleaned from the train hands, notably that of the brakeman and the baby elephant.

This baby elephant was so inquisitive about locomotives that one night he sneaked off from his herd to investigate the puffing creature that stood on a siding at the forest's back doors. The brakeman put the elephant in the baggage van, took him down to Bulawayo, and led him around the streets like a pet pup.

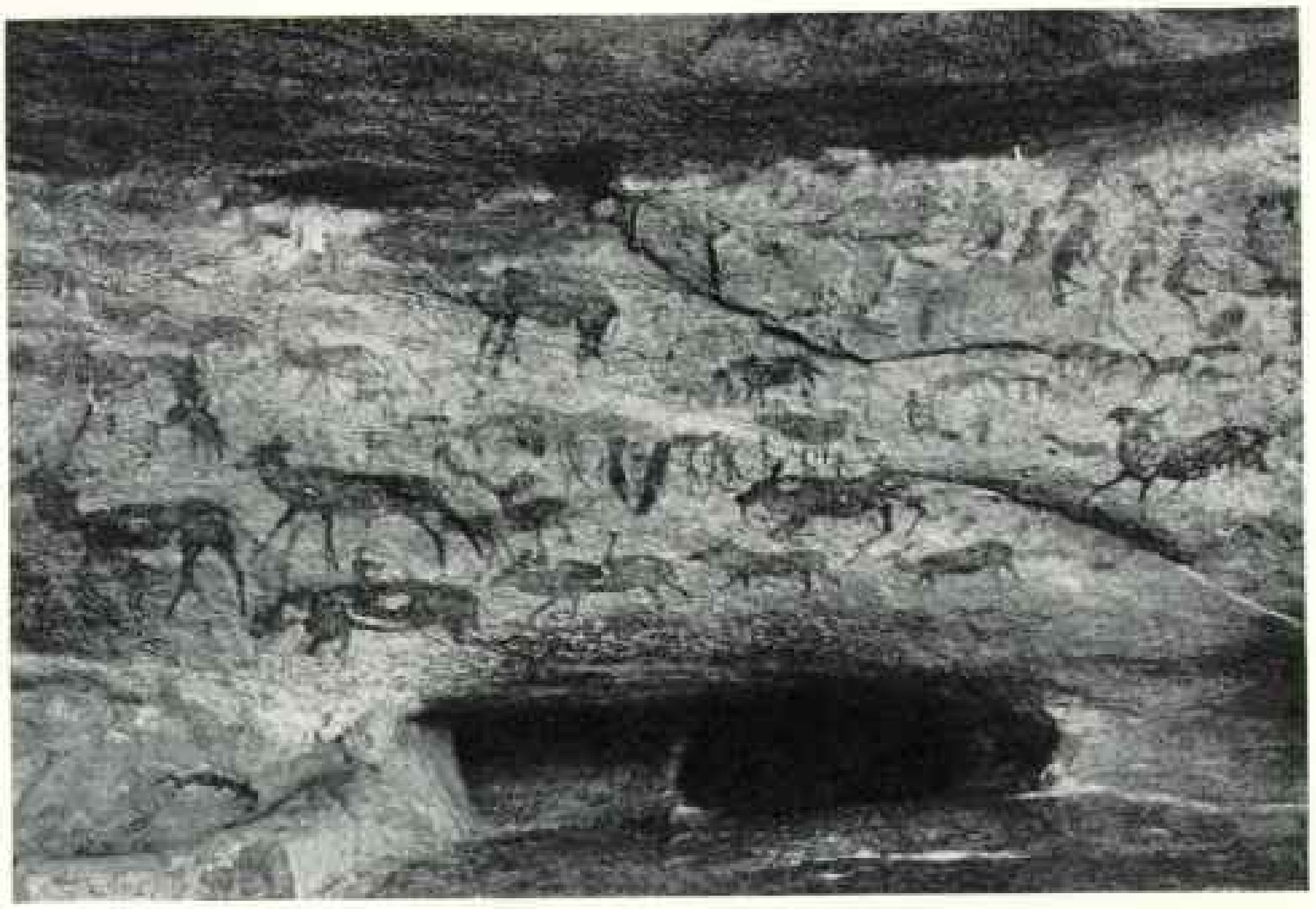
But some unappreciative folks put a "B. S. A. P." on that perambulating brakeman's trail, and the aforesaid police officer asked him if he knew that, since elephants were "protected" in Rhodesia, it was illegal and a punishable offense to possess one?

Said the brakeman, "Then I'll sell it." But, "Also illegal!" returned the B. S. A. P. Said the brakeman, "Then I'll shoot it." But, "Shockingly illegal!" responded the B. S. A. P. "And, what's more, it'll look suspicious if he happens to starve on your hands." That made the brakeman think hard. He ejaculated, "How in heck am I going to feed him?" To which the B. S. A. P. jeered unfeelingly, "Capture a mother elephant, I suppose."

All swank oozed from that brakeman. He retired to a secluded spot behind the railway sheds, and there he stayed, feeding the baby on the bottle. Then it caught pneumonia, and the frightened brakeman called in medical assistance—but unavailingly. And to the doctor's bills add the expense item of procuring affidavits certifying that death had resulted from natural causes. And so to burial.

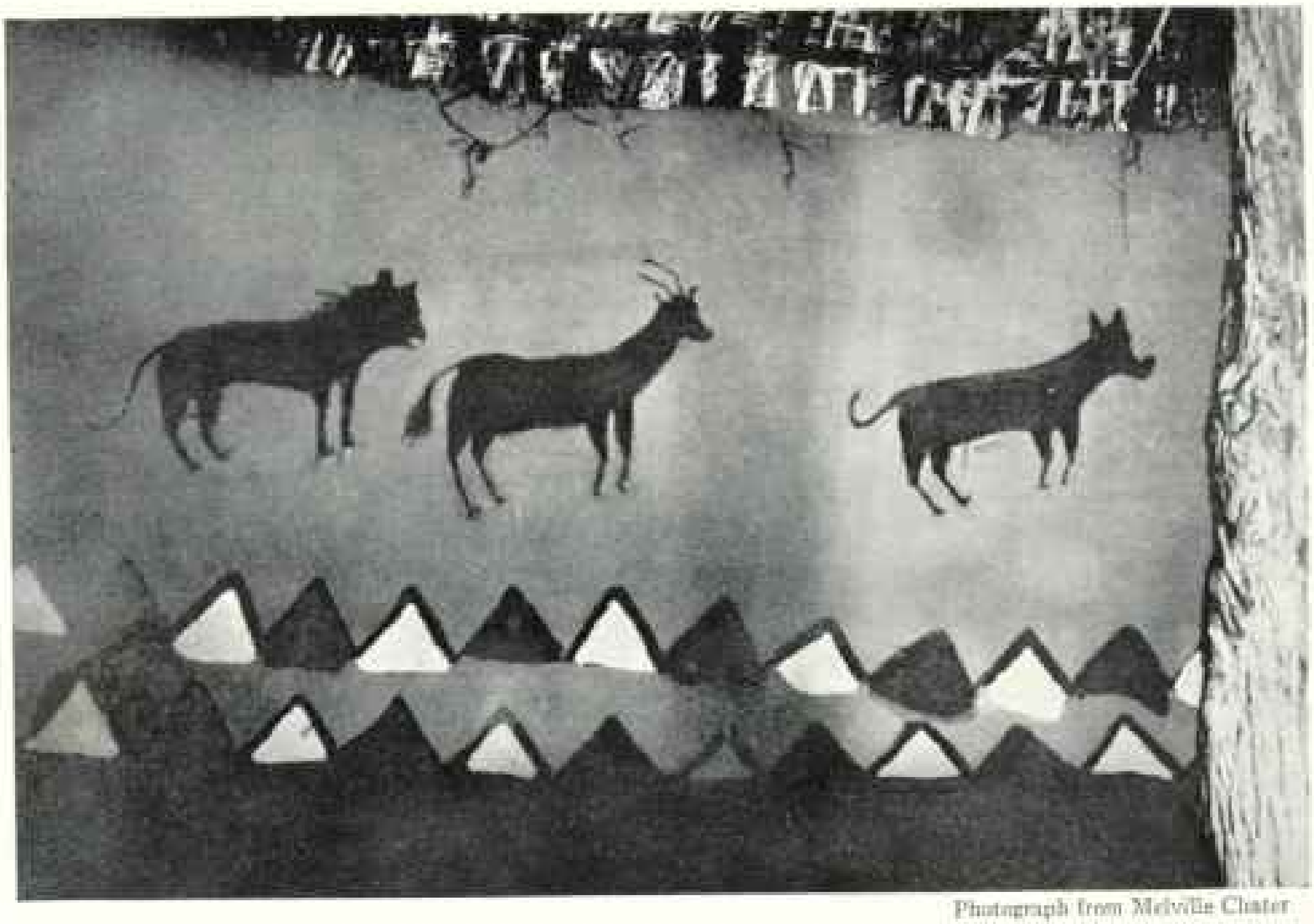
A "MADE-TO-ORDER" TOWN

The mining camp that we visited near Ndola suggested the magic result of someone's having enlisted a genie to create in short order a self-contained town to house 10,000 natives and 1,200 whites, with no



ON CAVE WALLS IN SOUTHERN RHODESIA ARE MANY BUSHMAN PAINTINGS

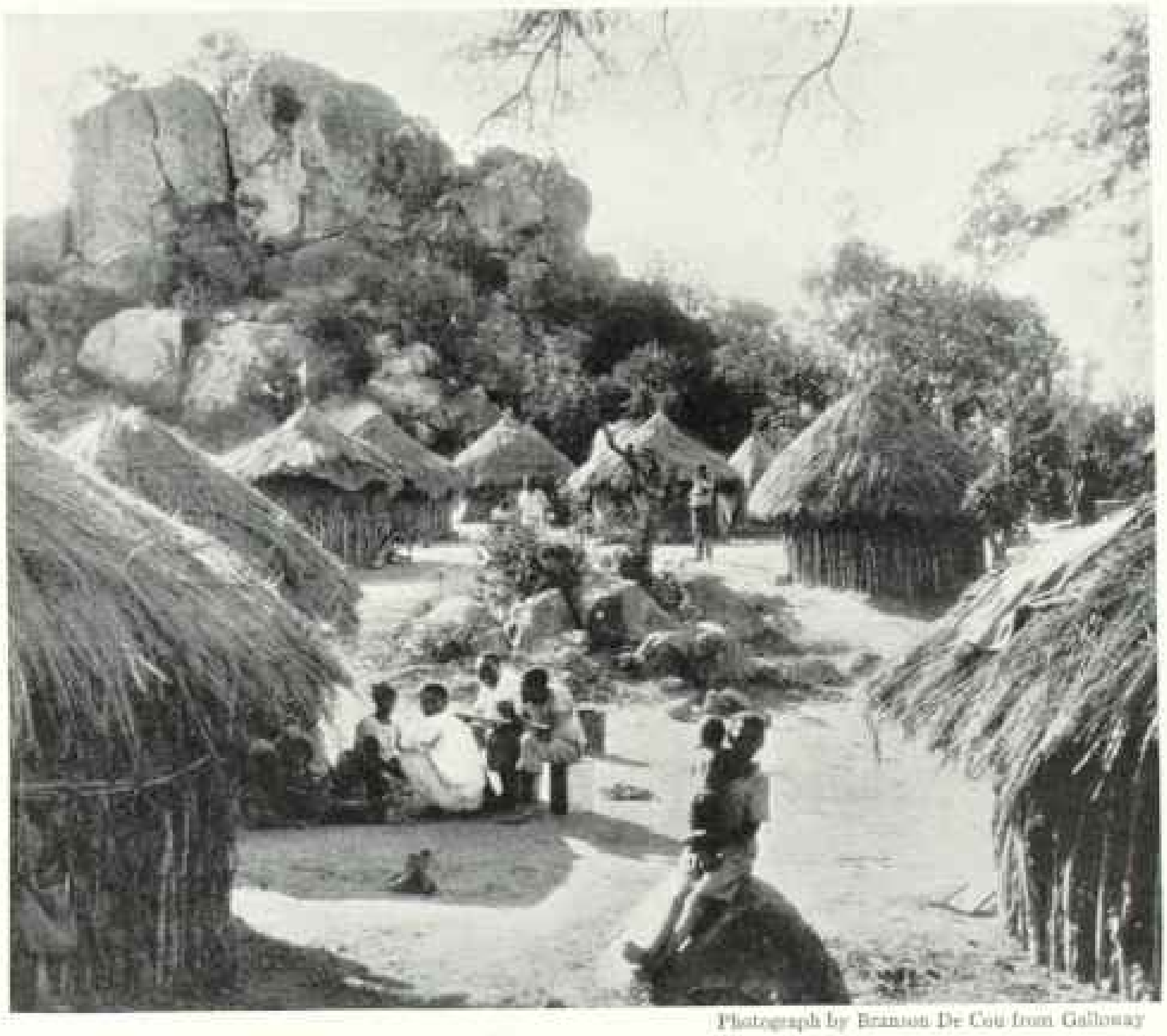
This picture, near the grave of Chief Soswe, shows a deer hunt, with figures of armed men slaying for food. It typifies a vast, early-day migration of game, described to the author by an old eyewitness as "billowing across the veld as far as the eye could reach."



Photograph from Melville Chater

A BANTU ARTIST DECORATED THE SIDE OF HIS HUT WITH THESE ANIMAL FIGURES

The author sees in the "modern" Bantu School no marked improvement over the efforts of the primitive Bushman (see text, page 754). These figures on a native's dwelling in a mine compound lack the grace and movement of the earlier rock paintings.



Photograph by Brenson De Cou from Galloway

"MAIN STREET" IN A NATIVE VILLAGE, NEAR BULAWAYO

Many tribes compose the Bantus of Southern Rhodesia. Before they migrated here from the north, this was the home of the Bushmen, whose stone implements and rock paintings have been found in many caves. Each tribe of present-day Bantus has its chief and council of elders. A kraal is made up of one or more families, whose head is responsible for the acts and conduct of his villagers. Each family tills its own plot of land, and if a man has more than one wife, each wife has her own household.

materials at hand and the nearest port 1,500 miles distant. For there it all was—mess halls, hospital, club, golf links, tennis courts, native compound, electric lights, water-borne sewage system, and some 500 bungalows abutting on the right-angled streets that, only a few years before, had been cut through virgin forests or through veritable ranges of giant "anthills" built by termites.*

"It looks as if things were here to stay," we said to the welcoming mines official, "that is, everything but the mosquitoes." For he had just mentioned the effectiveness of his anti-malarial "trench-warfare" system of drainage ditches surfaced with kerosene. "At what do you estimate the local copper-ore reserves?"

"Say, for the moment, 75,000,000 tons. But that figure represents only a small part of the known mineralized area. Four local mines alone will assuredly exceed the reserves of Chile copper, which up to now are the largest in the world. Did you ever see a copper mine's filing cabinet?"

He led the way into a little building where, ranged in consecutive order, lay innumerable cores of mineralized rock which had been cut from the earth by a diamond drill. After every five feet so cut by this steel, diamond-crowned tube, its solid contents are removed, numbered, and filed away, forming part of an ever-accumulating

* See "Stalking Ants, Savage and Civilized," by W. M. Mann, in the NATIONAL GEOGRAPHIC MAGAZINE, August, 1934.

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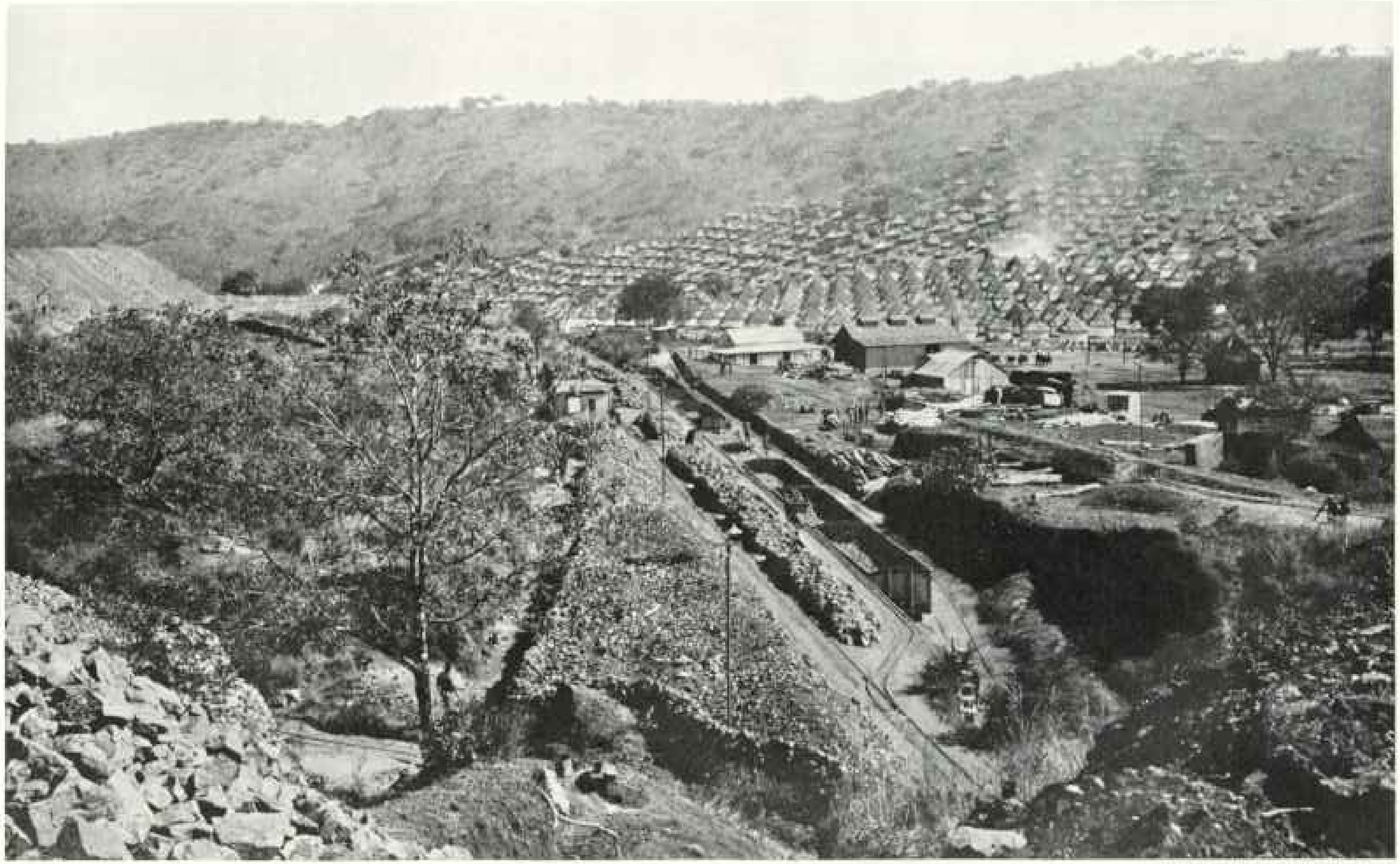
A MAIL TRAIN HALTS ON THE ZAMBEZI RIVER BRIDGE WHILE PASSENGERS VIEW VICTORIA FALLS

This majestic cataract, discovered and named by Livingstone in 1855, is about 800 miles from the river's source. The Falls are almost two and a half times as high as Niagara (see text, page 765). During floodtime their roar is audible ten miles away. From the chasm rise dense clouds of spray, and to the natives the Falls are known as "Smoke That Thunders."



Photograph by Melville Chater

HISTORIC MATABELELAND HELPS MAKE STAINLESS STEEL

Loaded cars on the Rhodesian Railway branch carry broken chromite ore at Selukwe. Circular huts of native miners stand beyond the mine buildings, and piles of ore appear in the foreground. "Chrome" is used in making armor plate, armor-piercing projectiles, the jaws of rock-crushing machines, turbine blades, airplane-engine valves, furnace lining, high-speed tools, and many other steel products.

Photograph by Melville Chater

MINING STUDENTS GO TO SCHOOL IN AN "ANTHILL"

To accustom these recruits to miners' tools and underground work, they are given preliminary training in this tunneled termite mound. They load and unload the dump cars and push them in and out of the tunnel for practice.

record of the strata of the mineralized ground (see illustration, page 770).

AN "ANTHILL" MINING SCHOOL

"And what is that brown dome over there?" I asked, pointing to a conical edifice which towered over the compound's low expanse of mushroom-shaped huts. "Is it a native church?"

He laughed. "No, that's our mining school. The Bantu boys arrive quite inexperienced, so we break them in by make-believe mining in that scooped-out anthill."

"Anthill? You're joking!"

"Not at all. Plenty higher ones than that. We use them as bunkers on the golf-course, and as—well, come and see."

We drove to what might well have been named Anthill Avenue, for its roadsides still exhibited traces of ten-foot walls, of termite structure, through which the steam shovel had ploughed. And, yet odder sight, rising adjacent to an occasional bungalow was some towering "anthill," with steps cut in its slope and a rustic arbor on its summit.

In fact, local housewives feel really slighted unless their backyard contains at least one such dome. And thus the architecture of a cousin of the ant—so long ago commended in Biblical proverb—has come into popularity in Northern Rhodesia. With which thought, we left that interesting region of termite skyscrapers and of "filing cabinets" whose documents consist of stone cores.

How long ago was it when man first worked Rhodesia's metals? Quite a respectable antiquity is indicated if we may believe the legend that King Solomon had gold mines in the Zambezian area. Some fourteen years ago Broken Hill sprang into print as the discovery site, in a modern lead and zinc mine, of the primitive Rhodesian Man. There was nothing, however, to indicate that he or his contemporaries had worked the surrounding ores.

Could early metallurgists see zinc precipitation being performed at Broken Hill today, they simply wouldn't know what it was all about. A medieval alchemist producing like results would probably have been burned on a charge of Black Magic. And even the modern layman, upon behold-

Photograph by Melville Chater

NOT A DAM OR A RAILROAD GRADE, BUT PART OF A VAST GOLD-MINE DUMP

From "reefs" or lodes, gold is extensively mined in the Bulawayo district, an undulating country much overgrown with mimosa and mopani bush. Hereabouts many white people are engaged in farming, dairying, and market gardening. This region forms a watershed between the Zambezi, on the north, and the Limpopo, on the south. Near the town of Bulawayo, railway-company buildings now stand where famous King Lobengula once had his military headquarters (see text, page 755).

ing zinc ore become liquid zinc sulphate, and that in turn, by electric decomposition, resolve itself into shining sheets of metal, might well be excused for likening the process to some baffling transformation by sleight of hand.

THE MAGNITUDE OF VICTORIA FALLS

It was at some 350 rail miles farther south that we caught a dull roar, as of millions of looms at work, and next the spectacle of huge smoke spirals rising high in air, as from a row of factory chimneys. Really, it was quite homelike, almost as if we were nearing some American industrial area.

"Victoria Falls!" announced Erbsmith, suddenly appearing at our compartment door. "Lord, sir, what a land of wasted opportunities! Them 'undreds of anthills—I'd 'ollow them out into chicken-coops, and start an egg industry. And now I'm reading that you can 'ear the Falls roar ten miles off, and that those columns of spray rise a thousand feet in air. And the crops simply parched for rain! Why, I would erect a big wind-making machine and *blow* those millions of tons per annum of spray across the surrounding countryside in the form of a refreshin' shower!"

Evidently the magnitude of the Falls had gone to his head—as it does to almost anyone's. In comparison with Niagara, they are almost two and a half times as high.* Their stupendous discharge at high water can only be vaguely suggested by one estimate that at each moment there plunges across the brink enough water to supply every person in the United States with three quarts (see page 762).

Of the Zambezi River the old Bantu burden ran:

"The great Lee-am-bye—nobody knows
Whence it comes or whither it flows."

And in that, the poetic sense, lies the true approach to the Zambezi's falls. They are too stupendous to be translated into thought

* See "The World's Great Waterfalls," by Theodore W. Noyes, in the NATIONAL GEOGRAPHIC MAGAZINE, July, 1926.

Photograph by Melville Chater

RHODESIAN TIMEKEEPERS KEEP THIS CARD-INDEX RECORD OF 6,000 COAL MINERS

For each day that a man works, a ticket bearing his number is filled out and placed on its corresponding hook. His type of job, the hours, rate of pay, and cost per day are among the items shown. Millions of tons of coal have been mined in both Northern and Southern Rhodesia.

by mere figures and facts. The awe-struck native felt aright. In his name for them, "Mosi-oa-Tunya," or "Smoke That Thunders," lies the pith of poetry. In it he has joined the vision of veld-fire smoke ascending skyward, to the affrighting reverberations of the South African thunderstorm. His is the primitive imagination that sees the Falls' tumbling cataracts as a stampede of white bulls plunging over each other, and the attendant rainbow arc as a sickle scything many-colored flowers in the spray.

What foam-flecked legends should have haunted here! Yonder waits the rainbow-bridge for Odin and his peers. That great, gloomy gorge, far below the Falls' rock lip —surely Charon's bark bides there in some mournful passage to the underworld! Some mist-wreathed Niobe is still "all tears" in the fine-falling rains that forever drench the bordering forest. And, in the water's roar, do you not catch—is it Thor's great hammer clanging, or the voice of Zeus, the Thunderer?

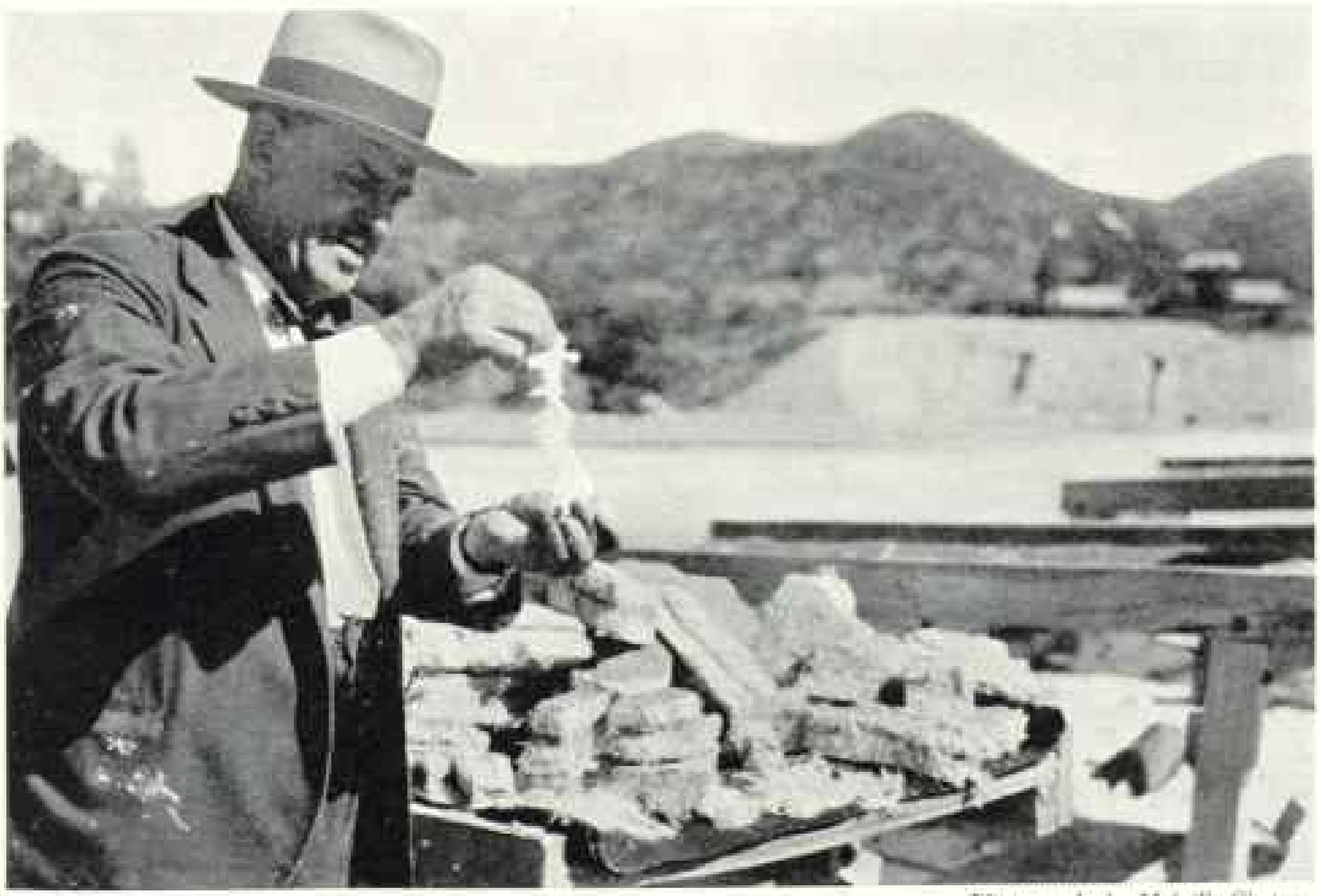
To get the Falls' most striking aspect, one visits the little island where, in 1855, David Livingstone went "creeping with awe to the verge," as he wrote, "and peered down into a large rent . . . and saw that a stream of a thousand yards broad leaped down." On the right hand he saw "nothing but a dense white cloud, from which rushed up a great jet of vapor," and on the left, "the mass of water leaps quite clear of the rock and forms a thick unbroken fleece all the way to the bottom."

THE LAND OF LIVINGSTONE AND STANLEY

Thirty years before he had been a factory boy at Blantyre, in Scotland. Some dual instinct to further God's work and man's led him to become a missionary in South Africa's untrodden wilds. For a quarter of a century he blazed the trail through thousands of square miles in the Congo and Zambezi areas, adding much to scientific knowledge by his close observation of Nature and peoples.

At the age of 53, with his wife and comrades dead of fever, he went grimly forward, alone. Though the outer world sent Henry M. Stanley to find and rescue the apparently lost Livingstone, nothing could induce the latter to relinquish his "call"

SO SOLID IS THE MOUND BUILT BY TINY TERMITES THAT A STAIRWAY IS CUT FROM IT



Photographs by Melville Chater

ASBESTOS CHUNKS, FRESH FROM THE MINE, ARE SAMPLED FOR THE FIBER'S SPINNING LENGTH

This mineral occurs in long and delicate fibers, or in fibrous seams, of a white, gray, or greenish-gray color. It is used in theater curtains, roofing, or where fireproof clothing is desired, since it is unaffected by fire. At the Rhodesian quarries many Bantus are employed to sort the rock. Ore is first crushed in roller mills, then passed over or through a rotary screen, from which, by suction, the liberated fiber is recovered.

and return to civilization. On he went, still alone, for a last seven years of sickness, dangers, disillusion.

With slave markets confronting him here, cannibalism there, unredemption everywhere, what wonder if to that solitary white wanderer his mission seemed a lost cause? His final disillusionment was to essay discovery of the Nile's source among those lakes and swamps where, in fact, the Congo rises. And had he, then, mistaken his whole long course on Life's river? But no, never! Onward alone!

By now he was litter-borne, fevered, with old hymn tunes in his ears. "Onward!" went the litter's rhythmic beat, "Onward, Christian soldiers!"

Then at last, in 1873, the old missionary-explorer was found, kneeling in his native hut amid the African wilds, his hands clasped, dead at prayer. To the black man his heart, to the white man his bones! Bangweulu's shores received the one, Westminster Abbey the other. How befitting for this trail blazer of English colonies and pathfinder of Christianity!

Within sound of the Falls stands the Northern colony's former capital, Livingstone, named, and rightly, for the explorer. For if Rhodes was the father of the Rhodesias, Livingstone was certainly their grandfather.

NEAT COAL MINES

Four hours south of the Falls we entered Southern Rhodesia's coal field area, whose estimated reserves of six billion tons have been under localized production since 1902. Now, to speak of a "clean" coal mine seems paradoxical, yet the galleries into which we descended were neatness and order itself, while the same might be said of the compound's huts that housed 6,000 native mine boys, of its outdoor movie, of its canteen and its hospital.

"Mostly injury cases?" we asked our guide, as we passed through the dispensary.

"Not one per cent. Mostly anemia. That's because the average native has a disinclination towards greenstuffs and fruits. So we make the latter more mysteriously attractive by intravenous injections of alkalized orange juice."

"How about injury cases occurring—well, in private life?"

He laughed.

"Oh, except for tom-tom beating and an occasional fight, at full moon, they're a pretty orderly lot. Yes, full moon seems to affect them somewhat as springtime affects your American office boys who bury their grandmothers by going to baseball games.

"But I think I can beat that story. One of our boys asked time off to go to a burial. 'Whose burial?' demanded the overseer. 'My brother's,' said the boy. Now, under polygamy, 'brother' may mean even a distant cousin. Anyway, the boy got off, settled old scores with some particular enemy, and turned up a few days later. 'My brother's burial finish,' he announced tranquilly. 'Now I go work like good boy.'"

Even a casual glance at the problems entailed in successfully handling some thousands of mine boys suggests Rhodesia's task in administering its Bantu population of some two and a half millions. This is effected through a Government-controlled régime of native reserves, tribal chiefs, and a modified adherence to the tribes' communal and patriarchal system.

Remembering that in some regions of Rhodesia natives still shoot game with poisoned arrows and make fire by means of the wooden drill, and that Bantus in general are still steeped in superstitious traditions, it may be fairly claimed that—taking the reserve system as an established necessity—this primitive people's way of living is interfered with in the least possible degree.

Moreover, it is very definitely assisted. Here, for example, is the Government's farming instructor, with some kraal headmen, inspecting a drought-stunted patch of mealies (Indian corn). He says, "No good!" then takes his pupils to a Government demonstration farm where King Corn's tassels wave proudly overhead.

Amazed chorus of headmen: "Wow! These are not mealies, but blue-gum trees!" They examine the soil. Dry and loose on top, it is moist underneath. "Wow! It is wet! Here is where the teacher of farming makes his rain clouds!"

"Not at all!" says the instructor. "If there is a lid on a pot, can rainwater get inside? Well, before the rains the demonstrator ploughed, thus taking off the earth lid. Then after the rains, he harrowed, so as to put the earth-lid on again, thus keeping out the sun."

Awed chorus of headmen: "Koos! (Chief!) It is *not* witchcraft! You indeed speak true words!"

Photograph by Melville Chater

TWISTING HELPS TO CURE A COWHIDE

With a pole as a lever, a dusky Southern Rhodesia native stretches the green skin hung on the low limb of a tree. Cowhide is the Bantu's traditional material for making war shields.

Wishing to see some of Southern Rhodesia by road, we had sent Erbsmith ahead to engage transportation. On the appointed day he turned up with a car and a native chauffeur, whereupon we took the road for the Great Zimbabwe.

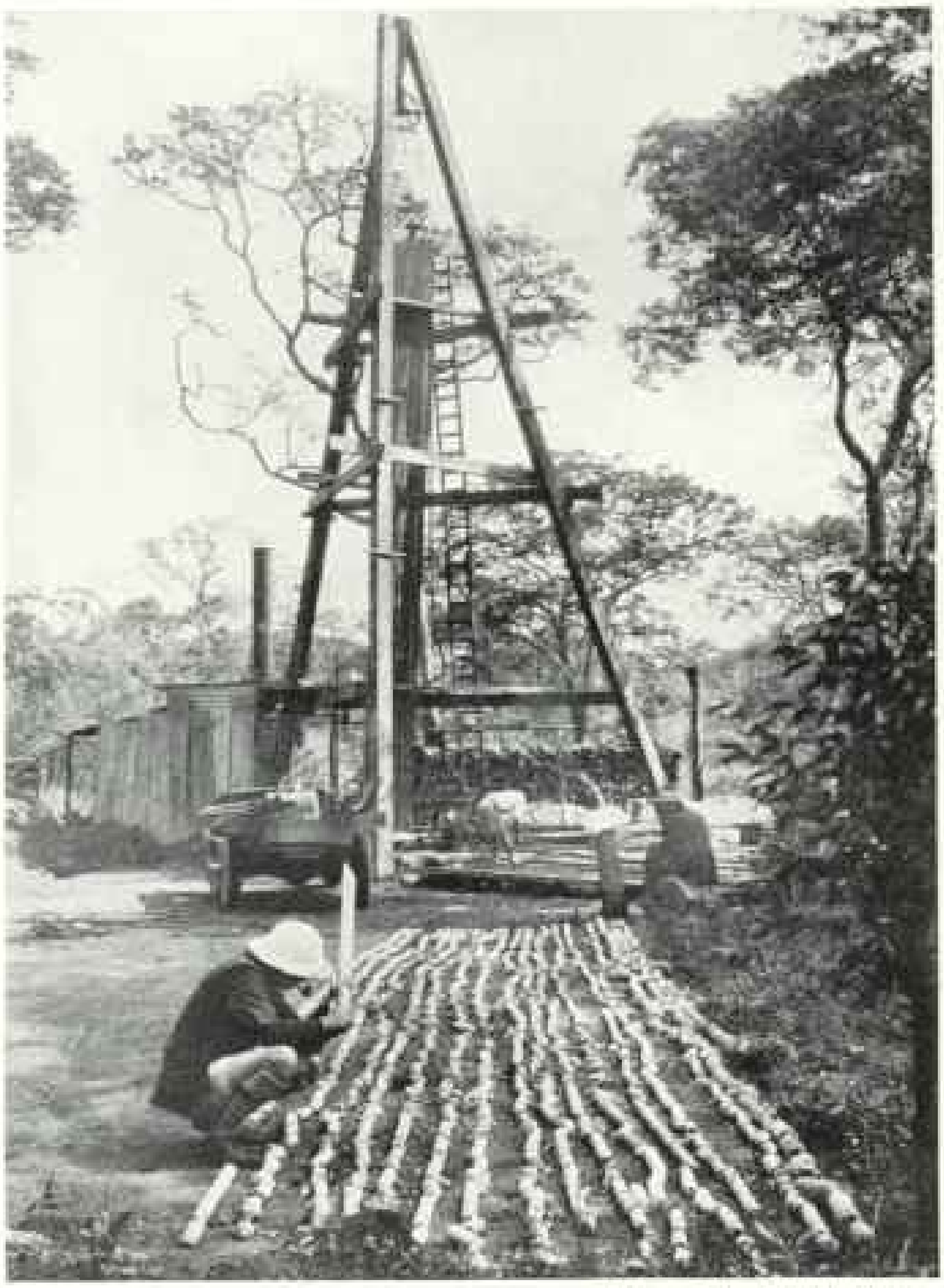
CHROME FROM SELUKWE FOR PITTSBURGH AND GARY

On the way we passed through several of Rhodesia's many mining centers. At Selukwe were vast dumps of chrome, about to be shipped from this, one of the world's foremost chrome-producing countries, to one of the world's foremost chrome consumers, the United States' steel industry. And at Shabani, which is but one center of Rhodesia's imposing asbestos production, we had an all-too-brief glimpse of that most un-minerallike of minerals. Cotton oozing out of solid rock would roughly resemble that fuzzy fiber which, in Rhodesia's case, contains a large proportion of the spinning-length grade (see page 767).

One Saturday night, at our humble inn in some rough mining town, sleep was impossible because our next-door neighbor kept bawling sentimental ballads in a voice the worse for liquor. Now, we knew the resourceful Erbsmith could achieve almost anything from setting legs to training animals, but could he stop a drunken man from singing? As a last resort we got him out of bed.

"I can 'andle 'im!" said Erbsmith promptly. And, sure enough, ten minutes after he had entered the offender's room a blessed silence fell, followed by snores.

Next morning we asked him how he had achieved the miracle. "'Ipnotized 'im," returned Erbsmith in a perfectly offhand manner. "Made a couple of passes and 'e



Photograph by Melville Chater

A HOLLOW DRILL BRINGS UP THESE "CORES" SO MINERS CAN PROSPECT AT GREAT DEPTHS

Copper-ore samples are laid out in exact sequence to show what the mineralized earth contains, the order in which the deposits occur, their depth, and extent. Labeled, they form a valuable file for determining future underground work.

dropped right orf. Dabbled in 'ipnotism, once, I did."

AMAZING RUINS OF A FORGOTTEN PEOPLE

Great Zimbabwe holds its own peculiar place among the world's famous ruins. Its fascination is not one of marbled beauty or of perfected art, but just the reverse, that of grim, unadorned strength uprearing itself amid nude Nature. One feels that it never centered a people's festivals, but was always a gloomy outpost in the wilds of a primitive land.

What must have been the stunned sensations of Adam Renders when he discovered Zimbabwe in 1868! There, amid those vast, solitary spaces, some 200 miles from the sea, it peered through the wooded wilds—a vast stone ellipse with walls from 22 to 32 feet high and some 800 feet in circumference. A chevronlike pattern ran around the crest of its walls. No mortar appeared between their symmetrically laid slabs. Queer, slab-constructed cones towered near inner-wall doorways, and still queerer gargoyles, of vulturesque appearance, leered at him from overhead.

Beyond a dip in the land rose a gigantic kopje with stone steps laid up its massive side. On its top primitive bowlders were utilized as wall bases, and a bit of slab-constructed bastion was surmounted by more of those curious cones.

Was the former work a temple, the latter a fortress? Yet why placed so remotely here, with no natural access? And by whom built, and how long ago? Renders must have had a long smoke and a long think. And, when later he asked some natives what they called the place, they answered, "Zim-bab-gi" (meaning "Strong Stone Buildings"), which left the mystery as deep as ever.

In time came other white men who discovered a long chain of more or less similar ruins. Even as far as 160 miles to the north of Zimbabwe were the crumbled forts and the astonishing aqueducts of some forgotten people. More, they discovered that the entire region of "strong stone buildings" was honeycombed with rock mines, whence doubtless had come the gold that went into

the many minutely engraved ornaments they had dug up in Zimbabwe.

GOLD FOR SOLOMON'S TEMPLE?

Gold—and on what a scale! Engineers have since marveled at those ancient mines, sunk in solid rock, sometimes to a depth of 150 feet. Experts have estimated their output at $375,000,000, whereas the now-known mine area, being double of what it was formerly supposed, may well have produced gold amounting to three-quarters of a billion dollars.

But who got it all? Page the corridors of time! Sixteenth-century Portugal had bad rumors of those mines. Might not the African "Sabi" and "Aufur" be the ancient "Sheba" and "Ophir"? At any rate, a Portuguese writer affirmed that "these were the mines where the Queen of Sheba obtained the gold she offered for the Temple of Solomon" (see I Kings, 10:1-10).

What said the Bible? "And King Solomon made a navy of ships . . . and they came to Ophir and fetched from thence gold and brought it to King Solomon" (I Kings, 9: 26, 28).

That bit of biography caused the gallant Francisco Barreto and his 16th-century gold-seekers to leave their bones blanching on the Zambezian veld. Moreover, it led modern scholars to compare Hebrew, Arab, and Persian records, with the result of formulating, among other theories, one claiming that "Zimbabwe culture" was originally introduced in remote times from western Asia (see illustrations, pages 757 and 759).

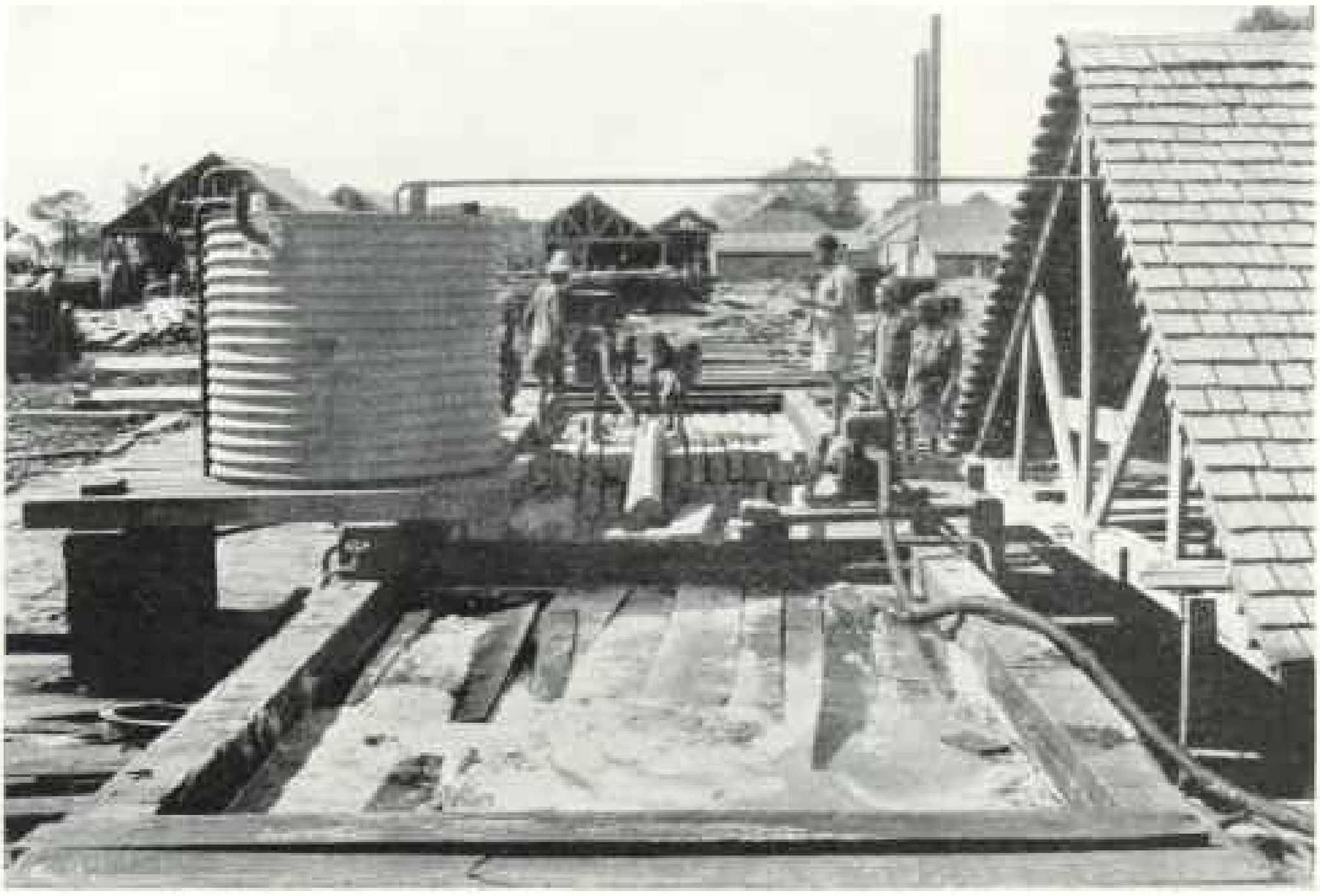
Photograph by Rev. Arthur J. Omer

RED MAHOGANY LOGS ARE CUT ON THE SLOPES OF MOUNT SELINDA, SOUTHERN RHODESIA

In the higher regions of more abundant rainfall, some trees reach 200 feet in height. Since early days of white settlements these forests have supplied both fuel and mine props. Until coal was found, railway locomotives here also burned wood.

Later came the critical counterblast that Zimbabwe was of Bantu origin and not older than the 14th or 15th century—a view that would be considerably strengthened if there existed elsewhere any such imposing structure of known negro origin. And now, most recent of all, is the illuminating discovery that non-Bantu metal smelters existed in the Zambezian area perhaps three or four millenniums ago.

But, of whatever origin, Zimbabwe remains a fascinating stage setting against which to conjure the long-dead actors that performed the drama of an ancient gold route—the priest at his mysteries, the



WOODEN RAILWAY TIES ARE BOILED IN ARSENATE OF SODA

Rhodesian forests supply the local teak from which these sleepers are hewn. The wood is as hard as the South American quebracho, or "ax-breaker," and weighs about 70 pounds per cubic foot. The treatment is for protection against the destructive borings of termites, called "white ants."

Photograph by Melville Chater

PATCHING PANTS FOR 10,000 BOYS!

This is one group of the crowd of tailors who, busy at their hand sewing machines, make and repair work clothes for an army of men and boys employed in a Rhodesian mine.

"STOP, LOOK, AND LISTEN," IN BANTU

Much of Africa below the Equator has one native language family. Bantu is spoken in some form or another by various tribes, including the forest pygmies. European linguists for decades have studied it and reduced it to writing. Excellent grammars and dictionaries are now in use.

Photograph by Melville Chater

BLACK BOYS GRADE TOBACCO IN A FACTORY NEAR SALISBURY

Here a bale is being inspected. In the background are "hands" of tobacco hanging on a rack. In the development of the industry, some seed was introduced from Virginia.

Photograph by Melville Chater

A NICE RIDE FOR BABY—IF MOTHER'S WATER JAR DOES NOT TOPPLE

Bantu fathers tend the family live stock, build the huts and grain cribs, and break new land for farming. Tilling and harvesting are done by women. It is a reproach for a wife to be childless. Twins are unwelcome; formerly the Mashona people destroyed all twins born to them. The gourd with the curved stem is a drinking cup; more primitive tribesmen use similar gourds, filled with dried peas, as rattles during their incantations.

watchmen on the walls, the overseer cracking his whip, the long line of metal-burdened slaves filing into the fortress-temple, that halfway house between the mines and the sea.

"King Solomon!" announced Erbsmith, as we drove off for Salisbury. "It's my opinion it's Masonic built and that 'e owned the show. And 'e'd need to. Wouldn't those seven hundred wives, et cetera, what with 'ats, dresses and fal-lals, make a pretty big 'ole in a gold mine?"

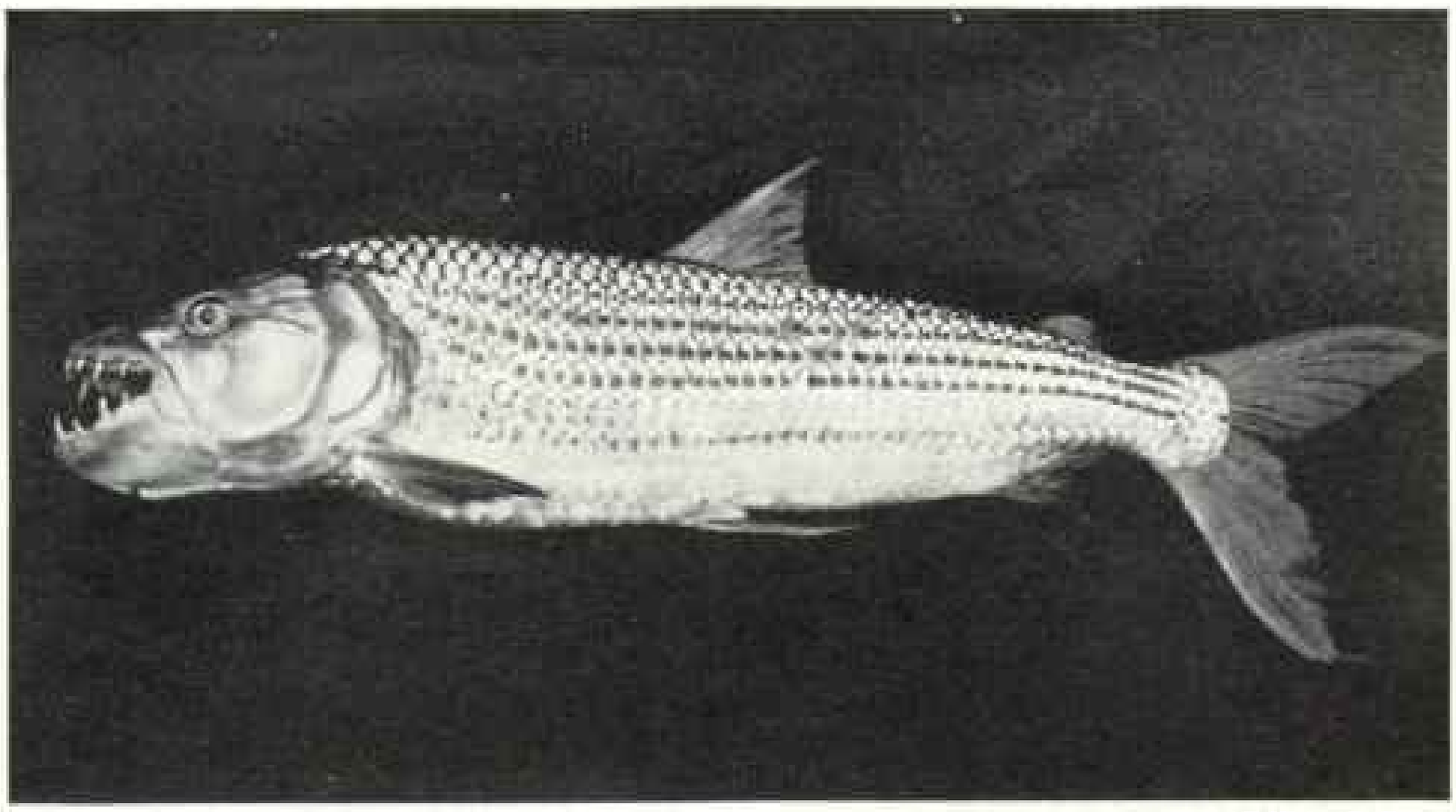
On our way we stopped at one of Rhodesia's largest cattle ranches—indeed, one of the largest in the world. To cite individual properties ranging up to 3,000,000 acres, as they still occur in Rhodesia, one would have to fall back on reminiscences of "when the West was young."

Hardly had Rhodesia got its charter, in 1889, when what later became one of its key interests, beef cattle, was wiped out by the rinderpest. Laboriously the industry was rebuilt on a basis of European stocks and the red Afrikander, until now, thanks to dipping precautions, Rhodesian cattle figures are well on the way to the three-million mark.

Yet there is still space aplenty in Rhodesia for game, even outside of government sanctuaries. Eight thousand head can play around in one corner of a million-acre cattle ranch without your noticing it—unless you're out for steaks or photographs. Herds of eland, kudu, tsessebe (or sassaby), impala, and diminutive duikers detoured skittishly within a stone's throw of our car as we circled the roadless veld, following that most beautiful of sights, the "dun deer" in his native haunts.

THE DANIEL BOONES OF RHODESIA STILL LIVE

It was at Salisbury, the capital of Southern Rhodesia, that we met the old pioneer. Imagine the thrill, were it possible for an American to chat with the contemporaries of Boone and Crockett! Yet any Rho-



© Victor B. Fare

THIS SAVAGE-LOOKING TIGER FISH WAS CAUGHT ABOVE THE FALLS OF THE ZAMBEZI RIVER

Sportsmen from all over the world visit southern Africa to try their skill against fighting fish. The specimen measures 24 inches and weighs seven pounds; some attain 15 pounds or more. They are caught with steel wire.

desian may hear the story of his country's founding from the lips of one of its pioneer fathers.

This old-timer, hale, ruddy, stood looking out on the broad thoroughfare, with its modern office buildings, its shopping crowds, its passing motor cars.

"All this makes a man feel like Methuselah! Nowadays, I'm told, Salisbury has forty miles of streets and some 28,000 people, while it seems only yesterday that we were putting up a few shacks on the open veld, and the baker's oven was in an anthill, and the butcher-shop was a table under a tree!"

"And how long ago would that be?" we asked.

"The year of the Occupation Column? Eighteen-and-ninety. You see, what with the Boers forming two colonies and the Germans making annexations, it was a race for the North. That's where Rhodes came in. He got a 25-year charter and put up nearly $500,000—speaking in your money—with the understanding that a pioneer column be sent into Mashonaland, which was to be rendered fit for civil government within nine months.

"Smart man, Rhodes! When the column's organizers objected to his plan of drawing pioneers from all parts of the South African Union, he replied, 'Don't you understand you're all going to be cut off, probably massacred? In that event, and if the men are from widely scattered constituencies, how much easier to work up political action and get a relieving force sent after you!'

"You see, we were going among the Matabele, where only a few white men, such as Livingstone and Frederick Selous, the explorer and hunter, had penetrated. Their king was Lobengula, or 'The Stabber of the Sun,' as they called him, and he knew we were coming. In fact, he had prophesied that one day a white *impi* (regiment) would come from the south in such numbers that it would have to use two roads."

"And did the Matabele attack?"

"No, although an impi, doctored for fighting, hung on our flank. The trek was about 1,000 miles long, and 400 of that was through dense forest; yet we had no casualties among our 400 to 500 men. And, do you know, what with our 117 bullock wagons making too long a column, we halved it by cutting two parallel roads, and so Lobengula's prophecy was fulfilled.

"Then, four months after leaving Mafeking, and having built some forts on the way, we hoisted the flag where this city now stands, and paraded before the Colonel. 'Ground arms! Right turn! Dismiss!' That

Photograph by Melville Chater

STRAIGHT THROUGH HUGE "ANTHILLS" ENGINEERS CUT THEIR WAY TO BUILD THIS STRAIGHT ROAD

White, conical huts of native laborers stand in the background. Until recent years, Rhodesian roads were mere tracks on the veld, passable only by oxcarts. With increased motor traffic, however, road and bridge building rapidly expanded. Thousands of cars, trucks, and motorcycles are in use, an automobile association has been organized, and danger spots on important roads are marked with warning signs.

order turned us into civilians. Every pioneer got a farm free, and that's how Rhodesia began.

"Oh yes, there were still troubles ahead of us. The Matabele rose twice in the first six years, and the second time they had 17,000 warriors out to exterminate us. But Rhodes stopped it. He used to say that any difference could be settled if you talked it out, man to man. So he went over from our military lines to the Matabele chiefs and held a big *indaba* (conference), and in the end they all threw down their spears and shouted, 'You are our father! Hail, Separator of the Fighting Bulls!'

"Yes," added the old pioneer, with a sigh, "those early days were the days! But now, what with Salisbury's buildings going up at the rate of $750,000 a year, and motor cars everywhere, and an airways service to London, it's getting too civilized for me. Think I'll go back to my ranch and shoot and fish, and grow sweet peas."

There is the plain tale of the founding of the British Empire's youngest self-governing colony. It was but part of a greater scheme whereby Rhodes dreamed of unifying the area lying south of the Zambezi—an area exceeding that which lies between the Mississippi River and the Atlantic. But such, like his "all red" Cape-to-Cairo railway, was not to be.

In 1923, chartered ownership of the Rhodesias, under the British South Africa Company, ended, and both were granted responsible government on the colonial protectorate model.

FROM MAIZE TO WHEAT AND ORANGES

What was to be the future of the Rhodesian colonists, some 1,500 strong, encamped 1,700 miles from the coast in a land that even today is 60 per cent wooded, and was then a virgin waste? Most memorably Rhodes had said that that future must depend on the colonists' own energies. And when the mine claim-pegging fever had subsided, and it was seen that staple foods

cost $350 a ton to bring in, the settlers began planting maize.

A quarter of a century later, that "pioneer crop" was being exported to the extent of 2,500,000 bushels annually. Moreover, experimentation had proved that, the Rhodesias being a temperate to subtropical region, such widely chosen varieties as Canadian wheat, Egyptian cotton, or West Indian sweet potatoes could be grown side by side.

Yes, it was a fruitful country—then why not try fruit? The experiment was made, and today, near Salisbury, you may see beautiful citrus estates of 50,000 trees, loaded with oranges and grapefruit, sprung from Californian stocks. But could the high Rhodesian veld grow such tobacco leaf as is produced at sea level in Virginia and Turkey? Stocks were imported from both sources, grown successfully, and blended.

THE PART OF THE "PIONEERESS"

Meanwhile, individual effort has developed into cooperation, crop specializing into mixed farming, and a Department of Agriculture, having to do with the cultural and financing sides of Rhodesian husbandry, has come into being for the benefit of the pioneers.

"Pioneer," be it noted, is strictly masculine. We have heard of the farmerette and the aviatrix, but never of the "pioneeress." Comparing the proportion of women to men in given countries, one finds that the older civilizations generally have an excess of the former over the latter, whereas the reverse is true of lands later settled, such as Canada, New Zealand, the United States, and Australia. Now, in this matter of male surplusage, the yet-younger Rhodesia out-tops almost all countries and exceeds the above-named quartette by a "masculinity" of from four to seven times greater.

That conveys, of course, no social picture of Rhodesia, where woman is playing her full part, as always. Rather, it tells the old story—that the foot-free man strikes out for new lands and, in time, sends overseas for that "girl at home" to make the land worth living in.

And just here the governmental settlers-assistance schemes enter the picture. Somewhat similar in effect to the Homestead Act that, in 1862, called American pioneers to plant their homes on free western lands, the Rhodesian assistance schemes went much further, in offering nominally free passages from England to the colony and, upon the settler's arrival, free agricultural instruction for a year.

Like the homesteader, he pledged himself to remain for three years. Unlike the homesteader, he was subject to a minimum and a maximum of available capital, and bought his land, at a dollar or so per acre, on a twenty-year installment plan.

To reach a Rhodesian settler's farmstead, you might possibly drive twenty wooded miles off the turnpike, and, if it is after nightfall, hear some stray lion gulping guturally in the distance. Yet, once arrived, you find yourself in a true home that the man and his wife have made together. He and his native boys have built the house, planning it around a big central room with a wide hearth. She has made it bright with gay curtains, with the rugs brought from overseas, with the homeland's flowers.

And the smart furniture? Well, Rhodesia has its teak, and it is astonishing what carpentry native "boys" can achieve with the assistance of designs cut from household magazines, and the vicarious elbow grease of your constant presence.

Across the broad acres the reaped corn stands in regimented stacks. There's a farm store where the settler sells to his native "boys." For amusements, there are horseback riding, hunting, and fishing, books from public libraries, and maybe a radio set.

As for educating the regional settlers' children, a minimum of ten pupils calls for the establishment of a governmental school. Failing that number, in sparsely peopled sections, there will be an "aided farm school," with a Government grant for each child.

THE COLONY'S "WILD EAST"

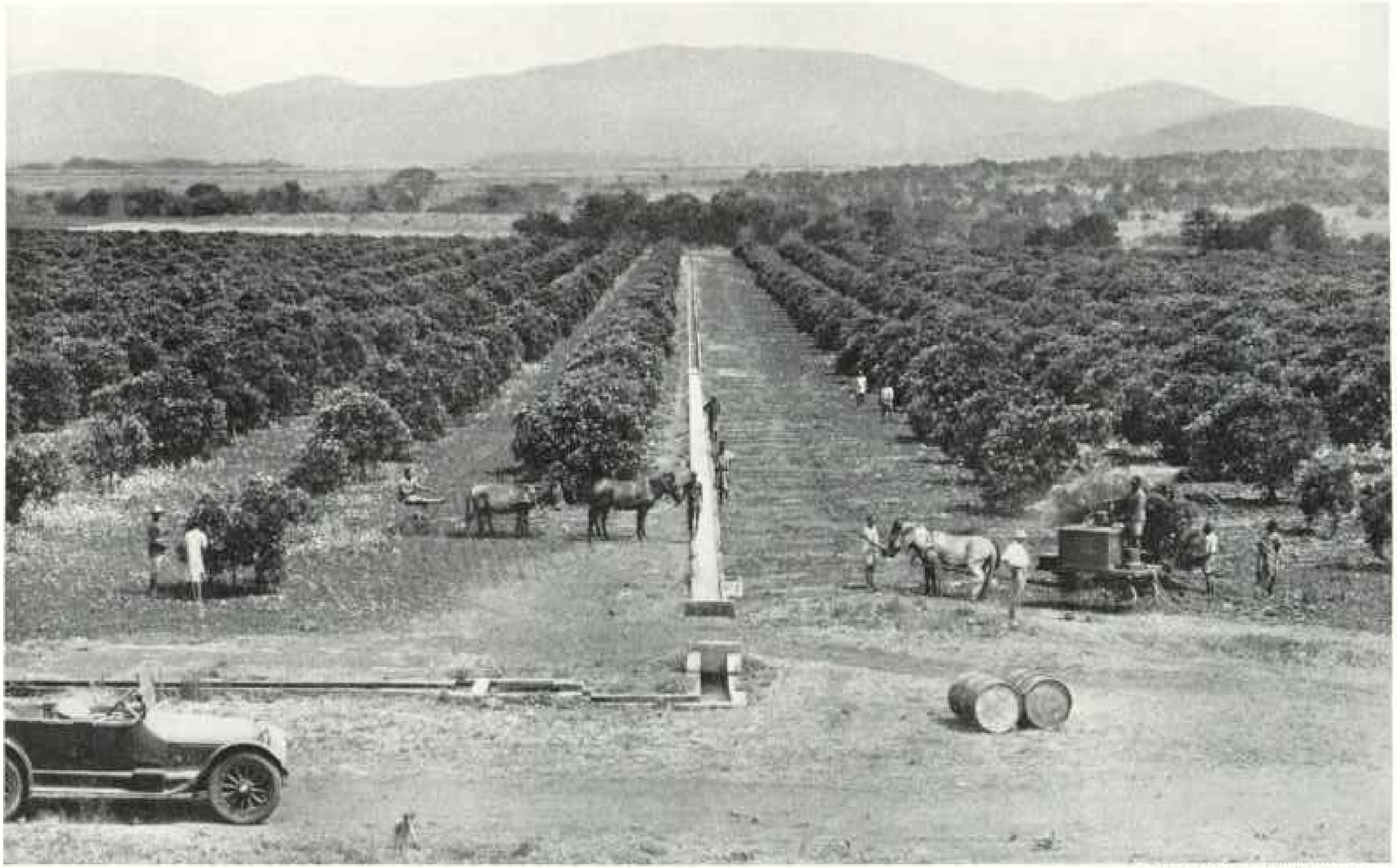
Heading eastward from Salisbury, we soon found ourselves nearing those mountains beyond which extends Portuguese territory. Completely cupped within their foothills' lofty profiles lies Umtali, eastern outpost of the Rhodesias. Nothing could reveal itself as a more charming surprise than this neat little town, tucked away on the colony's remote verge, its streets lined with tall Flamboyant trees that rear their masses of scarlet blossoms against the mountain-ringed valley's vastness of overhead blue.

Our 250-mile swing around a circle centering on Umtali revealed it as Rhodesia's

© J. L. Smith

THIS GIANT BAOBAB, OR "CREAM OF TARTAR TREE," NEAR VICTORIA FALLS, IS 77 FEET IN CIRCUMFERENCE

On it grows a gourdlike fruit, known as "monkey bread," which holds a pleasantly acid pulp that is eaten or made into a beverage. Its leaves and bark yield medicinal elements; rope and cloth are made from the bark. The baobab, "the sentinel of the savanna," has the ability to store up water against dry weather, and its hollow trunk is used as a natural standpipe by natives in some parts of Africa.



Photograph from Melville Chater

CALIFORNIALIKE IN FORM AND ASPECT IS THIS CITRUS GROVE NEAR SALISBURY, SOUTHERN RHODESIA

Through the grove runs the cement-lined irrigation ditch. At the right natives operate a standard spraying outfit for combating insect pests, with two reserve drums of fluid close at hand. At the left center a four-mule team draws a cultivator. In recent years the export of citrus fruits has increased enormously, the growers operating through a cooperative exchange.

© Victor B. Pare

THE FLOWER OF THE BAOBAB, OR CREAM OF TARTAR TREE

gateway to the wild heart of things, where waterfalls plunge over precipices, and primitive forests clothe the land with silence, and nude peaks pile their shapes against the sky.

Fortunately, our native chauffeur knew the roads, for at times we traversed fifty miles of wild woodland that offered no more guiding features than a dry streambed or some cement causeway, built at low level to allow seasonal torrents to sweep across instead of under it. Brilliantly plumaged birds flashed past, groups of rock-perched baboons discussed family affairs. Issuance into the open, with a mission church ahead, was an experience, while the passage of some other car was a downright sensation.

Yet, though we would not have guessed it, there were often kraals near the road, and thus we got a glimpse of native corn-grinding, snuffmaking, hairdressing (as complicated a process as permanent-waving), and listened to a fat old grandmother telling Uncle Remus stories in the original version.

The clumsy hyena, the greedy baboon, the sapient elephant — all are presented in the Bantu's imaginative throw-back to some Golden Age when man and beast were friends. As for the ever-triumphant hare, one recognizes in him the peart and sassy Br'er Rabbit in an earlier avatar.

ERBSMITH "DABBLES" IN LIONS

We descended over a magnificent mountain pass to Melsetter, there slept the night, then struck through the Chipinga region and the autumn-tinged woodlands of the Sabi River Valley. Here the giant euphorbia lifted its hosts of candelabra spurs against the sky. More curious still were the elephantine baobab trees, whose vast girth, gray color, and trunklike branches render that epithet doubly applicable.

Erbsmith, as commissary on the trip, was frightfully mortified when the ham in the sandwiches proved tainted. But he wrested success from failure and turned bad ham into a triumph.

Along the road we had noted the gnawed remains of a buck, and knew it portended that lions were about. Being without so much as a popgun, it was with eerie feelings that, some miles farther on, we descried a lion *couchant* on a mound by the roadside. The road was uncomfortably narrow, the lion was uncomfortably large. We stopped

at a respectful distance, behind a screen of brush, and waited for his majesty to move on. But move he would not.

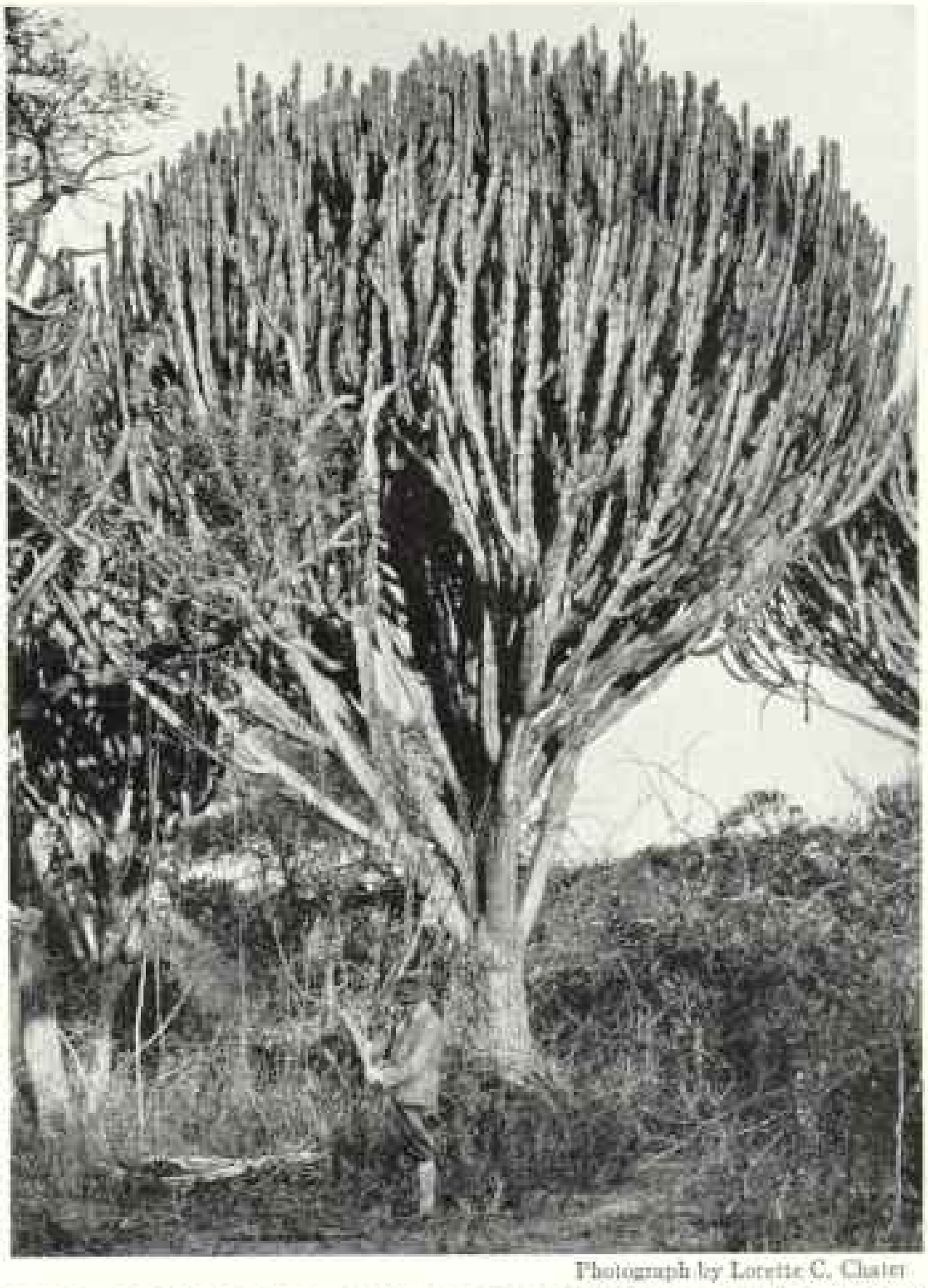
"Leave 'im to me!" whispered Erbsmith, with a sudden gleam in his eye. And, murmuring something about having "dabbled in lions a bit," he sneaked out of the car and made a wide detour into the underbrush.

Ten minutes later the recumbent monarch lifted his head, showed interest, appeared to sniff the air; then he stalked down from the mound and disappeared, leaving our way free. And, just about that time, Erbsmith turned up at the car, looking totally matter-of-fact.

"How on earth——!" we chorused, amazed.

"Knowing their ways, 'aving once worked in a zoo," replied Erbsmith, with perfect unconcern, "I rounded to where 'e could get the wind, and decoyed 'im with them 'igh 'am sammitches."

A 'day or so later we were back in Bulawayo to visit one last, near-by spot, the Matopo Hills, before catching the southbound limited.



Photograph by Lorette C. Chaire

LIKE A CANDELABRA, THIS GIANT EUPHORBIA LIFTS ITS ODD HEAD IN THE SABI VALLEY OF SOUTHERN RHODESIA

It is really not a tree, but an immense shrub having numerous varieties, found in many places. It bears a small flower. Certain species grow in the form of insignificant weeds. The African kinds include a succulent shrub, some specimens of which are spiny and resemble cacti.

A VALLEY OF BALANCING STONES

After a few hours' drive, the land began heaping itself into a wide series of rocky kopjes. Here Nature seems to have worked haphazard, flinging so many great bowlders atop of so many pinnacles that one might well call the place the Valley of Balancing Stones.

Now you clamber up the vast, smooth slant of a massive formation and find yourself on a rocky plateau, feeling antlike beside the huge, globular bowlders that are perched there over "World's View." Away stretches the tumbled kopje-heaped valley, resembling earth's beginnings as sculptured by some supernal Rodin, who has tossed the half-finished work aside, saying, "Make out of it what you can."

The bowlders immediately encircling you are vivid with lichen, in reds, greens, and gold. A child would call this a fairy place, and dream of enchantments. Then suddenly one severe slab, imbedded over what was laid to rest in the blasted-out heart of

Photograph by Lorette C. Chater

COUNTRY BOYS TAKE THEIR CHICKENS FOR A RIDE

Each donkey carries two wicker cages, in which live fowls enjoy ample light and air—a safe, sanitary coop, convenient for both poultry and peddler.

the rock, tells you that here has been high burial:

> "This Power that wrought on us and goes
> Back to the Power again. . . ."

Ah, power! Far better than any cathedral aisle does this "View of the World," Rhodes' self-chosen burial place, suit with the rugged power of the man. The gnarled pinnacles are his cathedral's spires, the richly hued bowlders his stained-glass windows (see pages 754-5).

Standing there, you reinvoke the scene of 1902—a five-mile procession winding thither, the Dead March from "Saul" resounding among the forlorn hills. That night his native "children" slew fifteen oxen as a sacrifice for their "Great Chief" who had gone. And thereafter the world learned that his vast wealth had been left to public ends, and, as witness the Rhodes Scholarships, "to encourage an appreciation of the advantages which . . . will result from the union of the English-speaking people."

Once, when Rhodes was a boy, he asked a gray-haired man why he should thus be busied planting oaks, since he would never live to see them full grown. Unforgettably for Rhodes, the veteran replied that he had the vision to see others sitting under the trees' shade when he himself had gone. And well may Rhodesia be likened to an English oak, springing by like vision from the dust now resting under the slab in the Matopo Hills.

Notice of change of address of your NATIONAL GEOGRAPHIC MAGAZINE *should be received in the offices of the National Geographic Society by the first of the month to affect the following month's issue. For instance, if you desire the address changed for your August number, The Society should be notified of your new address not later than July first.*

LIFE'S TENOR IN ETHIOPIA

Africa's Land of Early Christianity Now Yields Minerals for Modern Industry

By James Loder Park

Formerly Secretary of the American Legation at Addis Ababa

THE lights flickered. With one accord my wife and I rose to turn them down. Momentarily we had forgotten that we were no longer beside our kerosene lamps in Ethiopia, but were aboard ship, America bound.

Now, a month later, life on the fortieth floor of a Manhattan hotel seems fantastic, unreal. We marvel at almost forgotten luxuries. Here, water—hot, cold, and iced—actually comes from taps, not from a spring a mile and a half away, by gasoline-can portage on Ethiopian heads. Music is ours at the twist of a radio dial. More than a pious hope is an effort to telephone a friend. If the hotel chef has a beard that he keeps in high gloss with oil purloined from the salad dressing, we don't know it.

Far down below us are sidewalks designed for and used by pedestrians; there's no mid-street milling of a white *chamma*-clad multitude. Moreover, we haven't seen a mule—or a camel. We miss them.

Ten years ago, while stationed in Aden, I made my first visit to Addis Ababa, capital of Ethiopia (long known as Abyssinia). During the past six and a half years it has been my home. Despite limited amenities, residence there has been a pleasant one, for Ethiopia is a land apart.

Except for Egypt and Liberia, it is the only independent country in all Africa. Other empires through the ages have risen and fallen, but Ethiopia has endured. In the 20th century it is still a feudal land, with a people who are jealously proud of their freedom. The present ruling monarch, Haile Selassie the First, traces his lineage back to the union of the Queen of Sheba with King Solomon; her visit to the Jewish capital is a familiar Biblical story (I Kings, 10: 1-10, 13). The Nation's beginnings, however, are lost in the mists of the ancient past.

Today Ethiopia is not so large as it was when her rulers first gained their title "King of Kings," and the Pharaohs were the only other forces in Africa to be reckoned with. Only some 424,000 square miles of the once vast vague domain still remain. Nowhere does it touch the sea.

Since 1917 a 500-mile ribbon of steel, the Franco-Ethiopian Railway, has connected Addis Ababa with the outside world at Djibouti, on the French Somaliland coast. A Franco-Italian agreement early this year gave Italy an interest in this railroad.

Normally, trains make a leisurely climb from the lowlands to the 8,100-foot elevation of the capital in three days, with night stops at Diredawa and Awash.

"RAPID" TRAIN ONCE A WEEK IN THE DRY SEASON

A "rapid" 36-hour service, however, that was put into operation at the time of the coronation festivities in 1930,* has continued on a once-weekly schedule during the dry seasons, when the roadbed is safe from wash-outs. On our departure from there this year we traveled on one of the first experimental runs, when the time was reduced to 29 hours.

An overgrown, rambling village of about 70,000 people is Addis Ababa. It is comparatively new, having been built by the late Emperor Menelik II in 1892. Like earlier centers, which were usually abandoned when the wood supply was exhausted, it might have been doomed to a short life had Menelik not ordered the planting of eucalyptus trees. Today these trees provide the city with a mass of greenery, which to a large extent hides the corrugated roofs of the foreign-designed buildings and the circular thatch-roofed *tukuls*, or huts, of the natives.

A COLORFUL CAPITAL OF MUD HOUSES

Addis Ababa sprawls over more hills than did ancient Rome. On and on it rambles among the blue gums, without definite plan,

* See "Coronation Days in Addis Ababa," by W. Robert Moore, and "Modern Ethiopia," by Addison E. Southard, in the National Geographic Magazine for June, 1931; and "Nature and Man in Ethiopia," by Wilfred H. Osgood, August, 1928.

Photograph by W. Robert Moore

EMPEROR HAILE SELASSIE THE FIRST, IN CORONATION ROBES

Before his enthronement, four and a half years ago, the "Conquering Lion of the Tribe of Judah, King of Kings," was Ras Tafari Makonnen. As Prince Regent he had directed the affairs of State since 1916. This enlightened monarch is attempting to modernize the historic empire, where feudalism still survives.

radiating from the cluster of shops that form the market center. Two-story structures, they are in the main a mixture of stone and whitewashed mud walls. Bright blue and yellow calcimining add splashes of color here and there.

One small hill is crowned by the Imperial Palace, Audience Hall, and new Parliament Building; half a mile distant is a smaller royal palace where lives the Emperor's family. On the western edge of the city proper is the American Legation, rented from the priests who control the Menelik Memorial Mausoleum Fund, to which the late Fetawrari Hapta Giorgis, one of Menelik's trusted Galla generals, bequeathed his property.

Off to the east are the spacious grounds of the five European legations—on lands granted by the capital-building Emperor. These villas are some five miles from the railway station, which itself is more than a mile from the business district.

Washington is often spoken of as a capital of magnificent distances. Addis Ababa covers nearly as large an area. Transport thus becomes a problem for one who does not have a car. With gasoline at 75 cents a gallon and motor cars at twice their normal export cost, the number obviously is not large.

There are, however, about 500 motor vehicles under register in the country, most of them being familiar Michigan products. The mule still serves the majority of well-to-do Ethiopians. The average man walks.

In the street, Western haste is often brought to a horn-blowing standstill. It may be only market day, when thousands of peasants from the outlying districts bring in honey and hides and donkey loads of hay to buy and barter in the market place. Again, a provincial chieftain, with retinue of soldiers and servants sometimes numbering in the hundreds, will block the road in deliberate procession. With an inherently jaywalking populace, the few recently recruited traffic police have little effect.

BUGLE SOUNDS THE NIGHTLY CURFEW

Nightfall brings a bugle-call curfew for all good subjects of His Imperial Majesty. Foreigners are exempt, and their native

Photograph by Dr. Harry V. Harlan

SUCH BOLD ESCARPMENTS HAVE PRESERVED ETHIOPIA'S ISOLATION

It is a trek of more than two hours by caravan to the top of this precipitous wall, the last battlement of the eastern range. The high plateau region in the eastern and northern part of the country is scored by deep gullies and wide, eroded canyons, which entail hazardous descents and slow, grueling climbs. Much time and money must be expended to provide the land with good roads (see text, page 789).

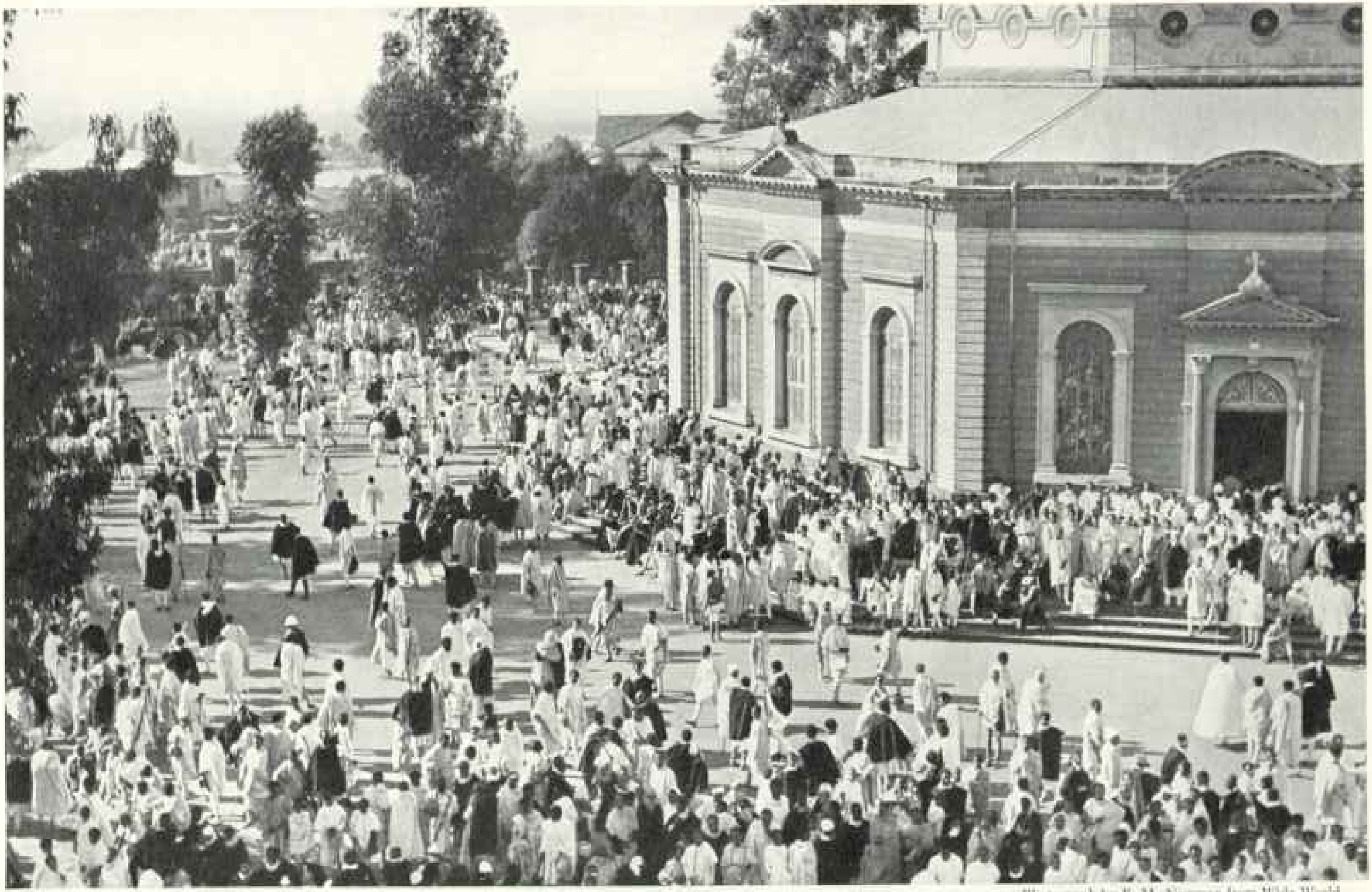
servants can obtain permits to return home after hours. After 8 o'clock the city is for the most part dark and silent, save for the voiced enthusiasms of hyenas and dogs.

During the coronation the principal streets were lighted by electricity. Some of the poles and wires have since been removed. Because of stringent times, the cost of operating the small municipal plant has been considered a dispensable item, and has been stricken from the common fund.

Seen day by day, Ethiopia shows few changes; yet, when I review the past ten years in which I have known the country, I find a definite advancement. It has been a decade of emergence and transition, touching prosperity and depression.

The streets are improved; asphalt and macadam surfacing have replaced many of the rough cobbled pavings. Electric lighting has increased through small privately owned plants. Water has been piped down from Mount Intotto to several distributing points in the market area, where the people can purchase it at the nominal cost of a penny for a five-gallon tin. More imported foods are available in the stores.

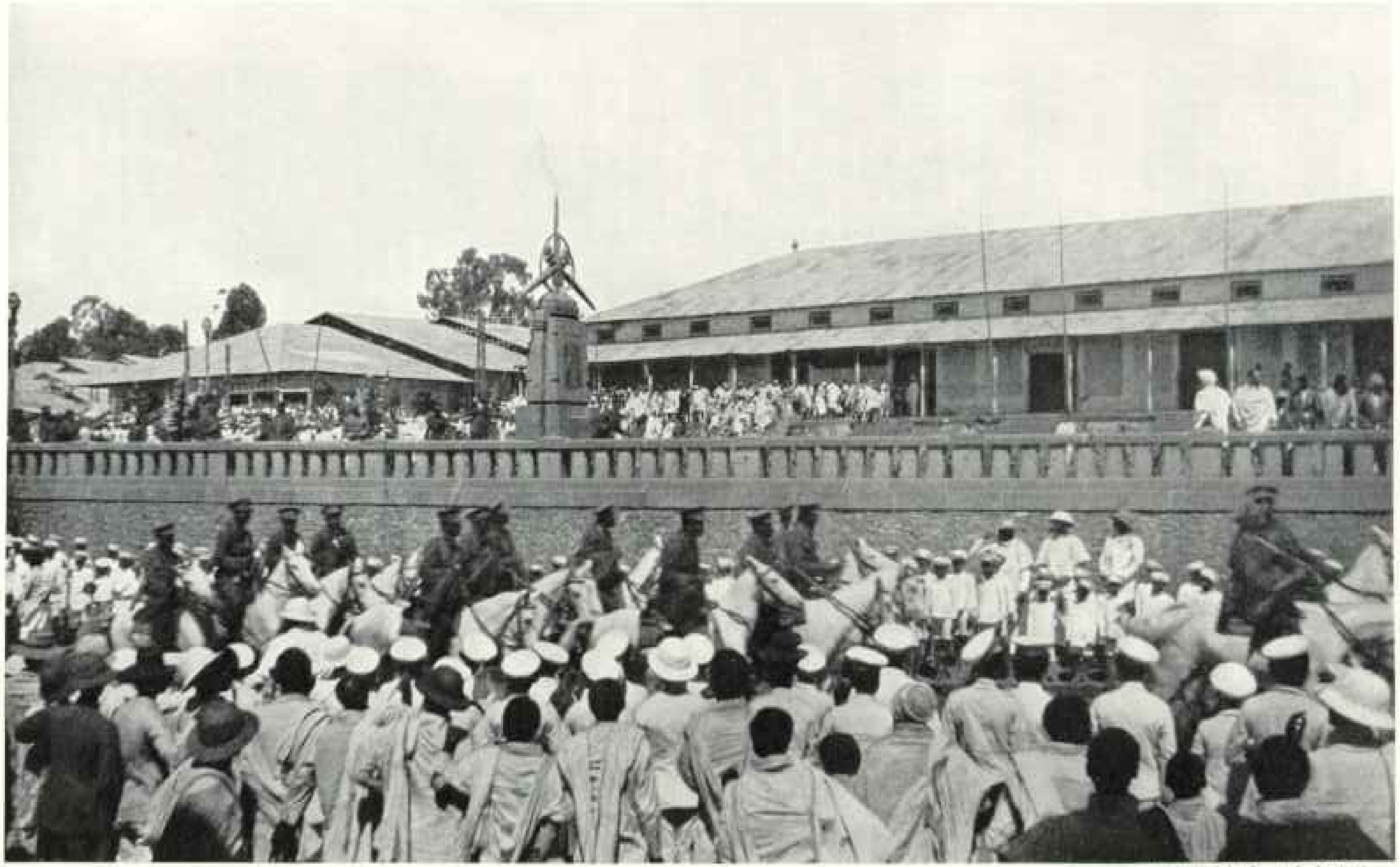
Recently sound pictures have come to Addis Ababa. The selection of films, in French, however, is mediocre, and the



Photograph by E. M. Newman from Wide World

EVERY SUNDAY SEEMS LIKE EASTER AROUND ST. GEORGE'S CATHEDRAL

This leading church, dedicated to the Patron Saint of Ethiopia, was built in commemoration of the victory at Aduwa, where, in 1896, Emperor Menelik II stopped the Italian advance. More than one fifth of the country's ruling race serves the Coptic Church. Religious rites often last all night, and the priests dance before the church as did the Jews before their temples (see text, page 791).



Photograph by James Loder Park

THE EMPEROR'S KHAKI-CLAD ESCORT CANTERS THROUGH THE CROWDED STREETS OF ADDIS ABABA

They are preceding the royal motorcar in which are riding His Imperial Majesty and the Crown Prince of Sweden, on the latter's recent visit to Ethiopia. In the center background rises the monument which was erected in commemoration of the coronation on November 2, 1930. Its three-pointed emblem symbolizes the Emperor's name, Haile Selassie, which means "Power of the Trinity."

sound production is such that they leave much to be desired. They have little appeal to the Ethiopians. The city even boasts a night club of sorts.

GOVERNMENT HAS FOSTERED PROGRESS

The progressive efforts of the Government have been significant. Menelik II united the empire by conquest; Emperor Haile Selassie has set up political machinery to develop a national consciousness. Well educated, he has attacked the problem with conscientious zeal.

A year after his coronation he gave a constitution to his subjects. With that act, and the recent changes in Siam and Afghanistan, has ended the last of the world's absolute monarchies. The Emperor's people are not prepared as yet for self-government, but constitution and Parliament are instruments by which he hopes to unify his country.

He opens Parliament annually on Coronation Day, November 2, in modern manner. He submits laws and regulations and otherwise plans the program of each session. The provincial chieftains, brought thus to the capital at regular intervals, will gradually learn the business of united government. But age-old feudalism cannot be uprooted in a few years. Like Afghanistan, Ethiopia is "making haste slowly."

There is an often quoted Ethiopian adage: "A man knows his master, but not his master's master." Airplanes, however, are reminding even the remotest peasants of the master of all their masters, the King of Kings. For Haile Selassie is now sending his winged messengers on errands to the distant parts of the Empire.

Education, too, is part of His Imperial Majesty's program to bring his country into step with the world. The casual teaching administered to the few by the clergy is inadequate. His schools, established first in Addis Ababa and now being extended to the provinces, are slow in getting under way. Enthusiasm has lagged, because youth does not yet realize its advantage.

Between 1930 and 1932 an American educator was enlisted as Advisor to the Ministry of Education and Fine Arts.

Several carefully selected young Ethiopians have also been sent to the United States, England, France, and Switzerland for advanced training; they eventually will share the tasks now carried by foreign instructors.

Various missionary groups are rendering excellent service along educational lines. Their hospitals are also spreading the idea, strange to the Ethiopians, of a qualified medical and surgical treatment to replace the fatalistic attitude regarding disease.

The hospitals too often are places of last resort and the staff labors under the handicap of losing many hopeless cases. But their popularity among the natives is steadily increasing, as the importance of early treatment is becoming more and more appreciated.

Two Government hospitals are functioning in Addis Ababa under the control of foreign doctors.

"Our native nurses and attendants are grasping the significance of their duties, difficult to teach to people without background in any technical work," said the director of one of these institutions when I visited there shortly before I left.

Within the past five years banking has become a State-controlled activity, absorbing by purchase the banking monopoly previously conceded to British interests.

This new State Bank of Ethiopia has recently issued a paper currency based on the silver content of the Maria Theresa thaler, which for years has been in circulation throughout the Empire, its most recently minted coins still bearing the original date of 1780. A decimal coinage in nickel and bronze has also replaced the fractional coins of Menelik.

TAXES PAYABLE IN HIDES, COFFEE, AND BEESWAX

Taxing is being systematized through the aid of an American advisor. The Emperor, however, is still the chief merchant of the country, for his subjects are granted the right to pay their taxes in kind, such as livestock, hides, coffee, beeswax, and even clarified butter.

There are numerous racial and physical obstacles to the Emperor's plans of consolidation of his empire. Many of the people are Moslem or pagan, while the ruling class has been Christian since the 4th century (see text, page 791).

In few lands has topography played a more important part in keeping alive the feudal system. The great escarpments that have served to keep the people separated and isolated from the rest of the world through the ages are now formidable barriers against a comprehensive system of

Photograph by A. P. from Keystone-Underwood

NOT A FALSE FACE, BUT A PRIESTLY SYMBOL

These sacristans of the Coptic Church appear in their elaborate robes of office as they attend a public church festival near Addis Ababa. The gaudy silk parasols, which are held over their heads, have been blessed. Feast, fast, and festival play major rôles in the life of the Ethiopian.

communications (see page 785). The country's central and northern mountain mass is scarred with torrent-gouged ravines that defy easy passage. Much time and money will be required to bridge these chasms in any plan to build trunk roads.

Today, Ethiopia has practically no roads. Trade filters into Addis Ababa by pack mule and camel train over ancient trails. During the torrential tropical downpours, from June to September, even this transport comes to an abrupt halt. For three months the upland region is a welter of mud.

During the past three years the Government has been working on two roads out from Addis Ababa, one fifty miles northeast toward Dessye and the other southwest for a hundred miles toward Jimma. When completed, these are expected to make cheaper and faster the movement to the capital of hides and skins from the northern pastoral lands and coffee from the south. They will, however, be but "fair weather" routes, as lack of capital probably will preclude the macadamizing of the graded surfaces for some time.

Photograph from Will F. Taylor

"WILL YOU ALSO HAVE SOMETHING ON THE HAIR, SIR?"

Instead of the close crop that this man is getting for a penny by means of a sheep-shearing machine in the Addis Ababa market, many Ethiopians wear their hair in a high pompadour, glossed with oil or rancid butter.

Joseph in bondage in Egypt foretold the lean years that were to follow the fat. But men seek today to control, rather than to prophesy the idiosyncrasies of the flooding Nile. In doing so, they have been looking eastward into Ethiopia. Out of Lake Tana, in the northwestern portion of the empire, issues the Abbai, or Blue Nile, which now debouches its greatest volume into the Nile proper when it is least needed and dwindles when it might nourish the cotton fields in Egypt and the Sudan.

As early as 1902 Great Britain and Ethiopia discussed its control. Since then several expeditions have been sent to Tana. During the past five years engineers of an American corporation have surveyed routes to and a site for a floodgate controlling dam at the headwaters of the river. If the project comes to fruition Ethiopia will gain, besides other advantages, a 300-mile road from Addis Ababa to Lake Tana.

A CROWN OF NATIVE GOLD

When Haile Selassie mounted the throne in 1930, the crown that was placed on his head was made from native gold. Out in the western and southern provinces one can find the Gallas panning gold from the stream beds. Foreign prospectors, too, have spent much time searching for the yellow metal. Platinum has been found, and one company is now producing about 2,500 ounces annually. Mica, coal, iron, potash, and other minerals there are, but just how much wealth lies hidden in the land no one really knows. With a new mining law regulating prospecting, the organization of a mining company, and an engineer and assistants now in the field, Ethiopia is attempting to find out.

The average Ethiopian still is the desultory tiller of the soil, scratching the earth with a bullock-drawn crooked stick, old almost as time itself. The fertile plains yield their increase with a minimum of effort. He has ample leisure in which to forgather and feast with his friends, or bear a rifle for his overlord.

The Ethiopian dearly loves a rifle. He would make any sacrifice to secure one. However old and worn it is, a rifle to him is still a rifle—a badge of manhood and of the brave fighting qualities of an unconquered race. A belt of cartridges, not necessarily fitting the bore, completes his happiness. The most highly prized possession of our cook was a bandoleer filled with cartridges, but he had not become sufficiently prosperous to afford the gun!

AN IMPRESSIVE MILITARY FESTIVAL

Each year at the Festival of Maskal (or Reception of the Cross), and on other special occasions, soldiers from all over the country, following their chieftains, pass in review before their emperor. Selected ones, dropping from the ranks, recount their exploits against man and beast with dramatic gestures and realistic war cries.

When I first went to Ethiopia the late Fetawrari Hapta Giorgis (see text, page 784) taxed me one day in Addis Ababa by asking: "Why did it take four years to win the war in Europe? Why did you dig holes in the ground? How can you beat an enemy by hiding from him?

"Ethiopians," he added, "would have finished it in a day. We attack in the open and fight to the very finish. The enemy is beaten by sunset!"

In the wars that he had directed, that had been true.

Comparable to the following of the military chieftains is that of the clergy. Approximately one fifth of the Amharas, or ruling race in Ethiopia, are connected with the priesthood. They hold large grants of land from which they derive needed revenue. Churches dot the country, many of them, however, being little more than elaborated native huts.

Ethiopia has been Christian since about A. D. 330, when Frumentius, a Phœnician youth, was consecrated as Bishop of Aksum by the Coptic Church in Alexandria.* Of romantic import is the conversion and baptism by Philip of the Ethiopian eunuch, who had charge of the treasures of Candace, queen of Ethiopia (Acts 8: 27-39).

The chief cathedral, dedicated to St. George, the Patron Saint of the Empire, is the principal feature of central Addis Ababa. It was built in commemoration of the victory at Aduwa, where in 1896 Menelik stopped the Italian advance (p. 786).

A MEMENTO OF SOLOMON'S TEMPLE

Many-sided, with three concentric chambers, it carries down to the present day the concept of Solomon's temple, with its Holy of Holies, the traditional repository of the Ark of the Covenant.

* See, "A Caravan Journey Through Abyssinia," by Harry V. Harlan, in the NATIONAL GEOGRAPHIC MAGAZINE, June, 1925.

Photograph by James Loder Park

BY HIS MULE YOU SHALL KNOW HIS RANK

Only an Ethiopian of social position can afford such a gaily caparisoned steed. The majority walk; a few have cars (p. 784). Such brilliantly dyed leather trappings are often enhanced by metal ornaments. Men wear close-fitting trousers and a knee-length shirt made of unbleached muslin; a softer cotton wrap, or *chamma*, is draped topawise over the shoulders.

Church service often lasts throughout the night, accompanied by melodious tolling of bells, chanting of rituals, and dancing by the priests to the cadence of cymbals, drums, and sistra. Ancient Geez, a dead language, is the ritualistic tongue for these centuries-old Coptic ceremonies.

Feasting, fasting, and worship play major roles in the life of the people. Lent is strictly observed by Ethiopians of high and low degree. Not only is meat abjured, but even eggs, milk, and other forms of animal produce. Whenever we heard the Emperor's lions roar at night, we then knew that a fast was in progress; they were not getting their usual ration of meat.

But feast follows fast and is generally lengthy and to the people an important amusement.

LITIGATION ON THE SPOT

About the only other Ethiopian diversion is litigation. Often when I walked through the market I saw one or more of these impromptu courts in session. For alleged petty wrongs a man can join his opponent in hailing a passer-by to serve on the spot as judge, there to remain, nights excepted, until a decision is reached. The judge thus chosen is bound by custom to act, since refusal might deprive him of a judge when sooner or later he, too, will need one.

"Ba Haile Selassie y moot" (By the death of Haile Selassie), they say in formal salutation, pledging the judge to act; and so begins the trial. Each man pleads his own case and most of them

Photograph by Ewing Galloway

ACCOMPANIED BY THROBBING DRUMS, THE CLERGY CONDUCT THEIR SERVICES

Bells, cymbals, and brass sistra are also used in the ancient rites of the Coptic Church, which are similar to those performed in the days of King Solomon. Lengthy chants are intoned in Geez, a language now used only in religious functions. To modern ears they sound like a voodoo ceremony.

are lawyers of no mean ability. If it is a case of a proved debt and the defendant is unable to pay, the creditor can always chain the man to his wrist, and thus be accompanied in his comings and goings until the debt is settled.

Criminal cases, of course, are handled by official courts. But the ancient Mosaic principle, "eye for an eye and a tooth for a tooth," is not entirely outmoded.

Marriage among the masses is normally a common-law union, accompanied by prolonged feasting, while weddings of higher rank are celebrated by ceremony and processions. Much native mead often adds to the hilarity.

Divorce, simple and frequent, is, like marriage, surrounded by traditional safeguards. Laxity, polygamy, and abuse of the marriage institution are strictly prohibited by custom and sheer force of public opinion. Divorce is accompanied by careful and proper division of chattels, pooled at marriage. A much-divorced woman is thus often considered a decided "catch."

A child of a divorced couple remains in the custody of the mother until it is three years old. From that time it belongs to the father, if he has paid for its support from birth.

A funeral may last for forty days, including days of condolence and weeks of wearing clothes dipped in blue or yellow color wash. The Emperor discouraged this waste of time by a proclamation last year, using as an example the untimely death of his own cherished daughter, the mourning period for whom was limited to three days.

Gradually, with many angles of approach, Haile Selassie the First, Conquering Lion of the Tribe of Judah, is steadfastly redirecting to progressive enlightenment the tenor of Ethiopian life.

Photograph by Richard H. Stewart

NEARLY THREE ACRES OF CLOTH FORM THE HUGE BALLOON

Workers in the Goodyear-Zeppelin factory at Akron, Ohio, cement the last few seams in the *Explorer II*. The new balloon has greater capacity than the balloon of last year—3,700,000 cubic feet, contrasted with 1,000,000 cubic feet. The increase in size is to make possible the use of non-explosive helium gas, which, however, has only about nine-tenths the lifting power of hydrogen. The larger balloon, using helium, can reach approximately the same height as last year's smaller balloon, which used hydrogen.

STUDIES PLANNED FOR NEW STRATOSPHERE FLIGHT WITH HELIUM

THE 1935 stratosphere expedition under the auspices of the National Geographic Society and the United States Army Air Corps, weather permitting, will make the voyage into the upper atmosphere in June in the *Explorer II*.

Basically, the new balloon will be a duplication of the first *Explorer*, which rose last summer to within a few hundred feet of the world's official altitude record. Even after a tear developed in its bottom, the balloon bore the unrelieved strain of the heavy gondola, and brought the three members of its crew safely down to a level from which they could jump with parachutes.* The new balloon assembly and its equipment embody many marked improvements, made possible by the valuable experience gained through the 1934 flight.

As an additional assurance of safety, the Advisory Committee of Scientists for the flight has decided to inflate the balloon with helium. This will be the first stratosphere flight to be made with helium. The balloons for the eleven flights that have already penetrated the stratosphere have all been inflated with hydrogen.

HELIUM CANNOT EXPLODE

The advantage in using helium is that under no circumstances can this gas explode. It is inert when pure and remains inert when mixed with air in any proportion. Hydrogen becomes highly explosive in certain mixtures with air, and therefore must be handled with extreme care. A hydrogen-air explosion constituted the final stage in the destruction of the balloon *Explorer I*, of the National Geographic Society-U. S. Army Air Corps Stratosphere Flight last summer.

The use of helium involves a somewhat greater expense than the use of hydrogen. The officers of the National Geographic Society and the Advisory Committee, however, feel that since danger of explosion is thus eliminated, the added expense is justified.

Volume for volume, helium will lift approximately only 92 per cent of the weight lifted by hydrogen. To enable the helium-filled 1935 balloon to rise as high as the hydrogen-filled balloon of 1934 was capable of rising, the new bag is being made approximately 23 per cent greater in capacity. Its volume when fully inflated will be 3,700,000 cubic feet. The 3,000,000-cubic-foot-balloon of 1934 was the largest constructed in all the history of ballooning.

Part of the 23 per cent increase in volume made possible the use of heavier fabric in certain parts of the balloon. The bottom fabric of the bag, in which tears occurred last summer, is the same weight as the main fabric of the balloon—three ounces to the square yard before the rubber is applied; 5.3 ounces, afterward. Last year the bottom fabric was of two-ounce weight. The top of the balloon bag is constructed of 4-ounce cloth, which, after being rubberized, weighs 7.2 ounces to the square yard. The band of rubberized fabric from which the attachment ropes for the gondola will be hung also is of 7.2-ounce weight.

When the heavier weight of the new, larger bag is taken into consideration, along with the lesser lifting power of helium, the 3,700,000-cubic-foot balloon will be able to reach the same theoretical maximum height as the *Explorer I*. It is estimated that it can rise above sea level to an altitude of more than 70,000 feet, or between 13 and 14 miles. The present official record, held by Lieut. Comdr. T. G. W. Settle and Maj. Chester Fordney, is between 11 and 12 miles. The *Explorer I* last summer came within 624 feet of this record.

ASCENT AGAIN FROM RAPID CITY

Balloon, gondola, and instruments for the 1935 flight have been completed. They have arrived at the site near Rapid City, South Dakota, from which the 1934 flight was made, where the facilities for preparatory work and for the take-off of the balloon from the cliff-rimmed basin in the Black Hills were so satisfactory.

The balloon was made at the factory of the Goodyear-Zeppelin Corporation, in Akron, Ohio. The same skillful crew of workers who put together the 3,000,000-cubic-foot balloon made the new giant bag.

The fabric of long-fiber cotton was coated with 30 applications of rubber, each extremely thin, to make it gas tight. The diameter of the new balloon, when fully

* See "Exploring the Stratosphere," by Capt. Albert W. Stevens, in the NATIONAL GEOGRAPHIC MAGAZINE, October, 1934.

Photograph by Benjamin Thomas

THE 1935 FLIGHT PERSONNEL EXAMINE THE BALLOON'S ROTATING FAN

Capt. Albert W. Stevens, in command of the expedition, is on the right; Capt. Orvil A. Anderson, pilot, in the center; and Capt. Randolph P. Williams, alternate pilot, in charge of ground operations, on the left. The fan, mounted at the end of a 14-foot arm and driven by a battery controlled by a switch inside the gondola, will slowly rotate the balloon and gondola so that the instruments may be swept around a vertical axis. To the left of the fan is shown an electric resistance thermometer, protected from the sun by a double tube. Attached to the shell of the gondola, on the right, is a vertical tube which encloses the apparatus for measuring the electrical conductivity of the air. Such an instrument has not previously been sent into the stratosphere in America.

inflated, will be 192 feet against 179 feet for the *Explorer I*. The additional 13 feet of diameter, seemingly a small factor, add 700,000 cubic feet to the volume of the balloon, and 15,157 square feet, or more than a third of an acre, to the area of the surface of the huge bag. The total area is about 115,845 square feet—approximately 2⅔ acres. The bag will tower 316 feet above the ground when poised for its ascent.

The gondola in which Capt. Albert W. Stevens, commander of the flight, and Capt. Orvil A. Anderson, pilot, will make the ascent, sealed in with the instruments, was completed in the Midland, Michigan, factory of the Dow Chemical Company, and was then taken to Wright Field, near

Photograph by Richard H. Stewart

THE GONDOLA RECEIVES ITS FIRST EQUIPMENT

Capt. Albert W. Stevens (standing) examines the motor and fan of the air-conditioning unit, while an assistant hangs small "mattresses" containing chemicals which will absorb the carbon dioxide and moisture exhaled by the flyers. A mixture of liquid oxygen and liquid air, from containers like that shown on the floor, will renew the air while the gondola is sealed and suspended far above the breathable atmosphere. A second assistant on the right is installing an aerial camera to obtain photographs showing the curvature of the earth.

Dayton, Ohio, where instruments were fitted into it. It has since been transported to the Stratocamp in South Dakota.

MORE SPACE IN THE GONDOLA LABORATORY

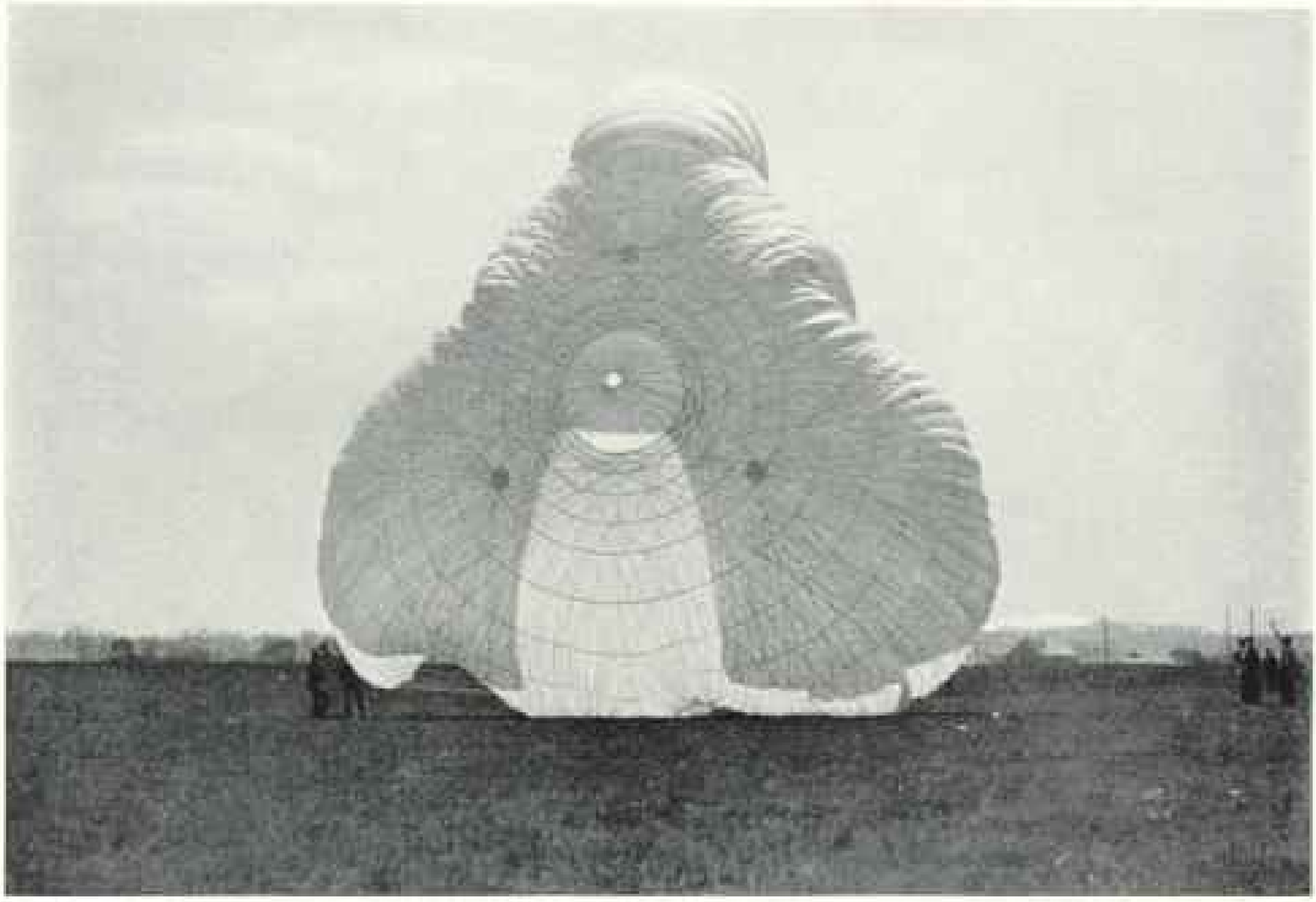
The experience gained during last year's flight demonstrated the desirability of having more room in the gondola. The new sphere, therefore, has been made 9 feet in diameter instead of 8 feet, 4 inches. The additional 8 inches have added 78 cubic feet to the space in which the two flyers will live and work with their instruments during the hours they are above breathable atmosphere.

The empty sphere and its hatch covers and arm weigh 638 pounds. Because of improvements in the suspension of the gondola, the additional space has been gained with practically no increase in weight over the 1934 ball.

Like its predecessor, the new gondola is built of Dowmetal, a magnesium alloy lighter than aluminum. The shell is three-sixteenths of an inch thick. The sphere has been subjected to rigid tests, involving strains and air pressures greater than it will receive during the flight, and has stood them perfectly.

Because the shelves used in the 1934 gondola took up much space, and because unusually shaped instruments could not be placed on them advantageously, shelves were not built into the new gondola. Instead, numerous anchorage lugs or knobs were provided on the inner surface of the globe. Instruments have been attached to these, and supported where necessary by individual metal struts or supports extending from the floor.

This new method of disposing of the instruments and the increased diameter of the sphere will give greater space for movement by the crew, more headroom, and will make for increased comfort and efficiency of operation. Changes in the two manholes also add convenience. They are larger, making it easier for the flyers to climb in and out. One of the manholes is in the same position as last year, slightly above



THE WORLD'S LARGEST PARACHUTE CAN LOWER THE GONDOLA SAFELY

The blunt-nosed triangle of silken fabric, 80 feet across, will be attached to the gondola and taken aloft on the stratosphere flight as a safety measure. The parachute, shown during a ground test at Wright Field, near Dayton, Ohio, was designed by Lieutenant Colonel E. L. Hoffman. The parachute was opened to the position shown by a stream of air from airplane propellers. Later the silken triangle was successfully put through a test by being dropped with a dead weight of 1,400 pounds—that of the gondola, exclusive of ballast and disposable equipment. The parachute has 184 attachment lines. The odd shape, including the curious bulges, was adopted after long experimentation because it assures quick opening and freedom from swinging during descent.

the "equator" of the globe. The other is below the mid-line, a position which should facilitate an emergency exit.

ASSEMBLING THE INSTRUMENTS

The gondola and the instruments were shipped to the Materiel Division of the Army Air Corps at Wright Field, near Dayton, Ohio. There, in one of the best equipped machine shops in the country, the various instruments, cameras, and other items of equipment were assembled, fitted, and installed; outlets were prepared for the numerous electric wires and air tubes that must pass through the gondola shell; and tests were made of the devices in their proper positions. They were then removed for shipment to Rapid City, but, once having been fitted, they were reinstalled without loss of time.

An even larger number of scientific projects will be carried out during the coming flight than during the flight of 1934. Probably six different instruments will be carried to record various phenomena in connection with cosmic rays. There will be a battery of thermometers, barometers, barographs, and altimeters, some inside and some outside the gondola.

The large sunlight spectrograph instrument which hung 500 feet below the gondola last summer, and which was brought down intact by its separate parachute, will be taken aloft again in its former position. One additional spectrograph, to record the spectrum of sky light near the horizon, will be carried in the gondola.

PHOTOGRAPHING THE PATHS OF COSMIC RAYS

Other instruments and pieces of equipment to be taken on the new flight include: air sampling chambers; sun-brightness, sky-brightness, and earth-brightness meters; air-conditioning equipment, vertical, oblique, motion picture, and recording

Photograph by Richard H. Stewart

THE VITAL SUSPENSION BANDS FOR THE BIG BALLOON TAKE SHAPE

The heavy load carried by a stratosphere balloon must be distributed so that there is no greater pull on one part of the fabric than on any other part. The mathematical curve known as the catenary spreads the strains evenly, and the attachment bands are therefore cut into such curves. On the left is a part of the lower, or load, catenary band. Its top edge (left) will be cemented to the balloon fabric, forming a belt below the equator. From the loops at each of the band's 160 points a rope will extend downward to help support the gondola. The catenary band on the right, with more sweeping curves and fewer points, will furnish the 36 attachment points above the equator of the balloon for the ropes that will hold the bag to earth during inflation.

cameras; and radio transmitters and a radio receiver. They are similar to those used in 1934.

A "cloud chamber," filled with argon gas and alcohol vapor, will make it possible to photograph the actual paths of cosmic rays through the chamber as well as the paths of particles released from atoms by the rays. The operation of the cloud chamber depends on the fact that the rays and the particles produce ions in the gas along their paths, and that under certain conditions tiny fog droplets of alcohol form around the ions, thus making the paths visible.

Another new piece of equipment is a Stosse chamber, which will record bursts of energy produced by the collision of cosmic rays with atoms of lead surrounding the chamber. A third new project will be the measurement of the electrical conductivity of the air at various altitudes, to be accomplished by a specially designed instrument attached to the outside of the gondola (see illustration, page 796).

As a result of valuable experience last year, important changes are being made in the method of carrying and releasing ballast. Sacks of fine lead shot will be carried, hung on the outside of the gondola so that they can be released by making an electric contact either from inside the gondola or from its bridge deck outside. In addition,

the heavy batteries taken aloft to operate various mechanisms will be carried suspended from brackets on the outside wall of the gondola, in such a way that they can be released near the end of the flight and allowed to fall, each attached to its parachute.

Last year the plan was to tie parachutes to the batteries and throw them out through the manholes. The batteries are classed as "disposable ballast," to be kept as long as they are useful, then discarded, thus reducing considerably the weight supported by the balloon.

A new, 80-foot parachute, capable of supporting the gondola, has been designed by Lt. Col. Edward L. Hoffman for the forthcoming flight. The giant parachute has been provided with a release mechanism which can be operated either from inside or outside the gondola.

Again, the National Geographic Society and the Army Air Corps are receiving whole-hearted cooperation from a number of scientific organizations and individual scientists.

Dr. Lyman J. Briggs, Director of the National Bureau of Standards, is serving as chairman of the Advisory Committee of Scientists for the flight, and is lending the valuable aid of the Bureau and of many members of its staff. The Bureau's technicians are working on the design of an instrument for measuring the water-vapor content of the air at high altitudes. The United States Coast and Geodetic Survey and the United States Bureau of Mines are assisting in the solution of special problems. Maj. Gen. Stuart Heintzelman, Commander of the Seventh Corps Area of the Army, is making available through Col. W. R. Pope, of Fort Meade, the facilities and personnel for the Stratocamp.

Governor Tom Berry and other officials of South Dakota have extended many courtesies to the project and have made possible valuable cooperation by the National Guard of the State. The citizens of Rapid City, through their Chamber of Commerce, have assisted in numerous ways. Apparatus for obtaining data in regard to cosmic rays is being furnished by Dr. W. F. G. Swann and Dr. Gordon Locher, of the Bartol Research Foundation of the Franklin Institute, and by Dr. Robert A. Millikan, of the California Institute of Technology. Dr. O. H. Gish, of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington, has designed the apparatus for recording electrical conductivity of the atmosphere. Dr. Brian O'Brien is directing the spectrographic observations. The Bausch and Lomb Optical Company is building the spectrographs and furnishing other optical equipment.

SEARCHING FOR SPORES IN STRATOSPHERE

A double parachute assembly, carrying a collecting tube as sterile as a surgical dressing, was designed by Dr. Briggs and by Drs. Lore A. Rogers and Fred C. Meier, of the U. S. Department of Agriculture. The apparatus is to determine whether living spores are floating in the cold but sunbathed regions of the stratosphere.

Stratosphere air will stream through the tube as the device floats downward for more than five miles; and, if the air contains any spores, they will be trapped by a sticky substance. While the apparatus is still six and a half miles above sea level, a tiny aneroid barometer will trip a device which will clamp sterile pads over the ends of the collecting tube, and parachute and apparatus will float on down to the earth.

The U. S. Weather Bureau, under the direction of its chief, Mr. Willis R. Gregg, is cooperating with the meteorological station set up and operated at the Stratocamp by the Signal Corps of the Army. The station's personnel will consist of eight men assigned from the Air Corps and the Signal Corps. Complete reports from the United States Weather Bureau will be received over the teletype machines at the camp. The National Broadcasting Company, which maintained voice communication between the balloon and the earth throughout last summer's flight, will throw its network of stations open to broadcasting by the explorers from the stratosphere. The Fairchild Aerial Camera Corporation, the Folmer Graflex Corporation, and the Bell and Howell Company are furnishing the cameras.

Others assisting by providing instruments and equipment for the flight are the Eastman Kodak Company, the Hamilton Watch Company, R. C. A. Manufacturing Company, the Radio Marine Corporation, the Sperry Gyroscope Company, Fairchild Aviation Corporation, the Chicago, Burlington and Quincy Railroad Company, Sherman Fairchild, Col. Edward A. Deeds, Charles F. Kettering, and Dr. A. Hamilton Rice.

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IMMEDIATELY after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resulting given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, spouting fissures. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

AT an expense of over $50,000 The Society sent a notable series of expeditions into Peru to investigate the traces of the Inca race. Their discoveries form a large share of our knowledge of a civilization waning when Pizarro first set foot in Peru.

THE Society also had the honor of subscribing a substantial sum to the expedition of Admiral Peary, who discovered the North Pole, and contributed $35,000 to Admiral Byrd's Antarctic Expedition.

NOT long ago The Society granted $25,000, and in addition $75,000 was given by individual members to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees of California were thereby saved for the American people.

THE Society's notable expeditions to New Mexico have pushed back the historic horizons of the Southwestern United States to a period nearly eight centuries before Columbus crossed the Atlantic. By dating the ruins of the vast communal dwellings in that region The Society's researches have solved secrets that have puzzled historians for three hundred years. The Society is sponsoring an ornithological survey of Venezuela.

TO further the study of solar radiation in relation to long range weather forecastings, The Society has appropriated $63,000 to enable the Smithsonian Institution to establish a station for six years on Mt. Brukkaros, in South West Africa.

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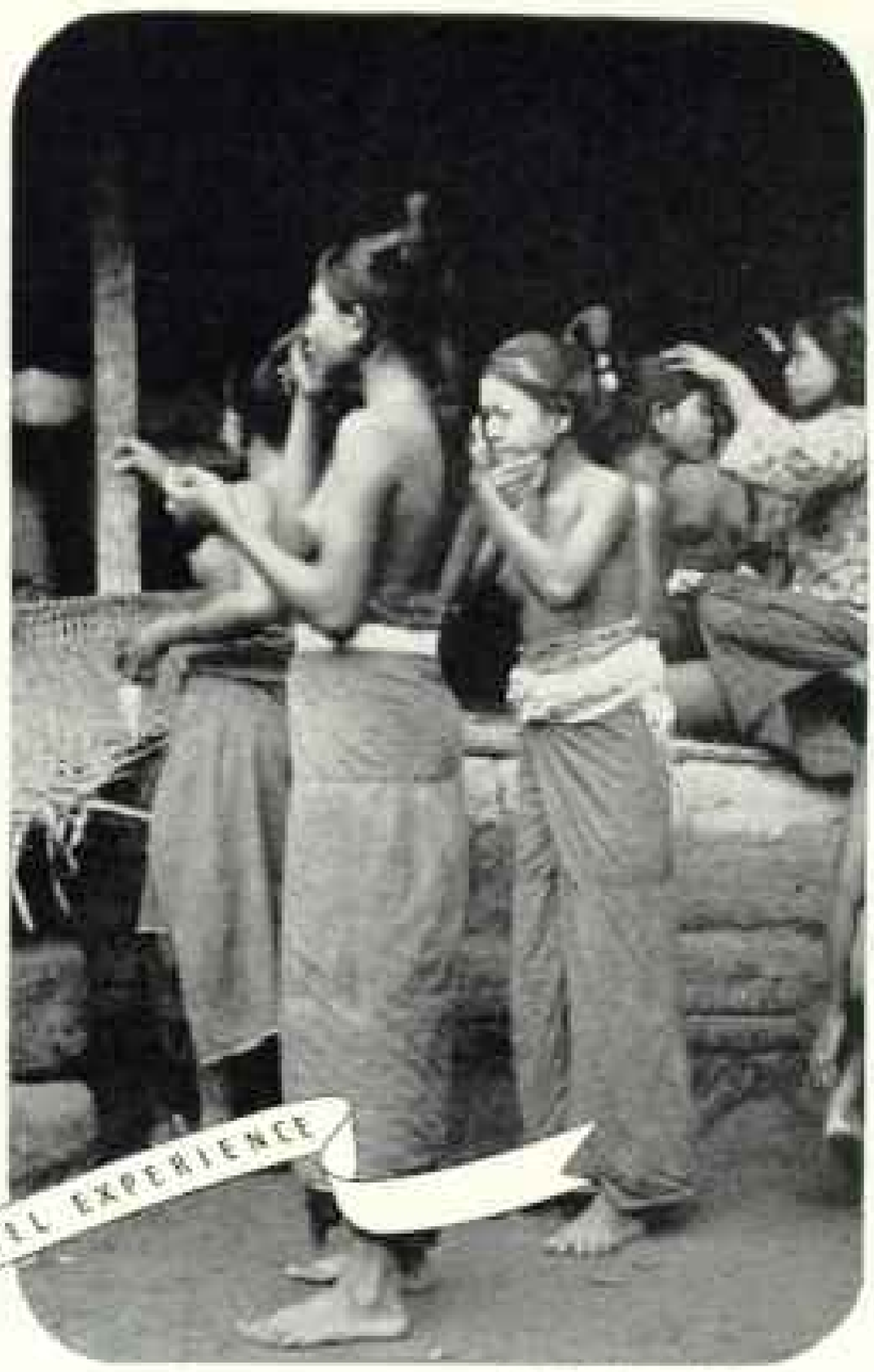

Photos by Evsenius DeCoux

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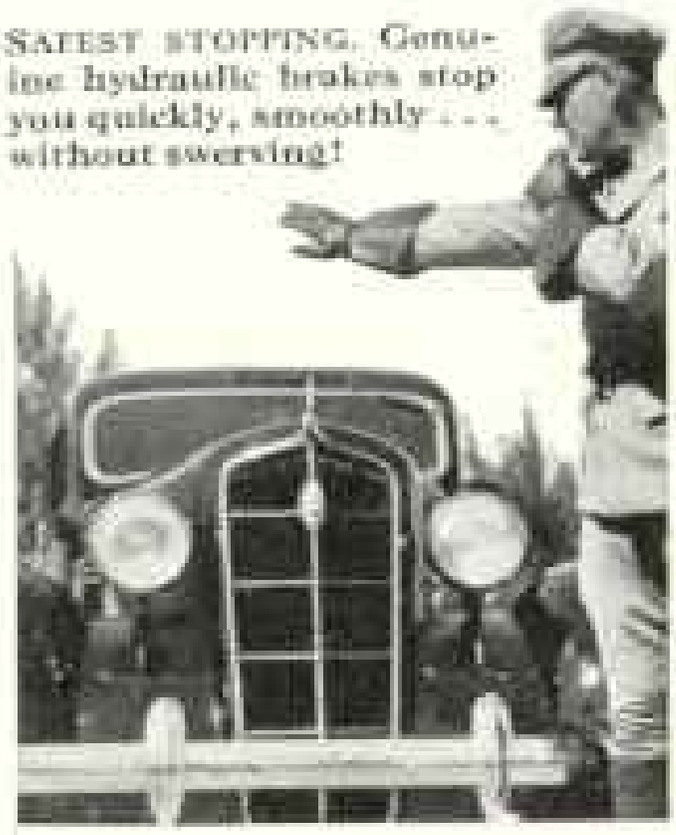

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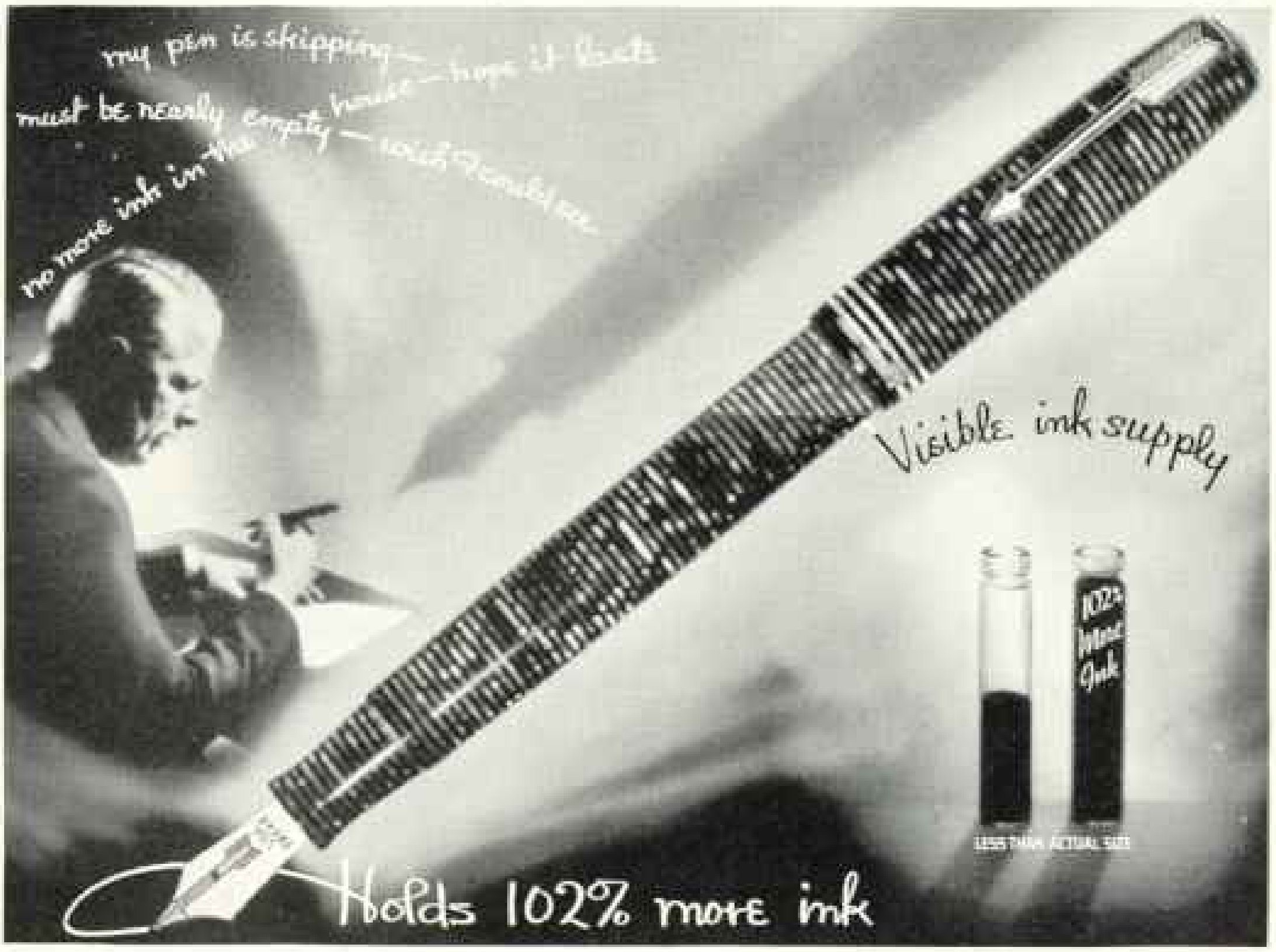

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Every time that you write, your Train of Thought flashes along rails more delicate than gossamer. And every petty annoyance—every distraction—caused by a pen that skips and runs dry, obstructs the track and derails the train.

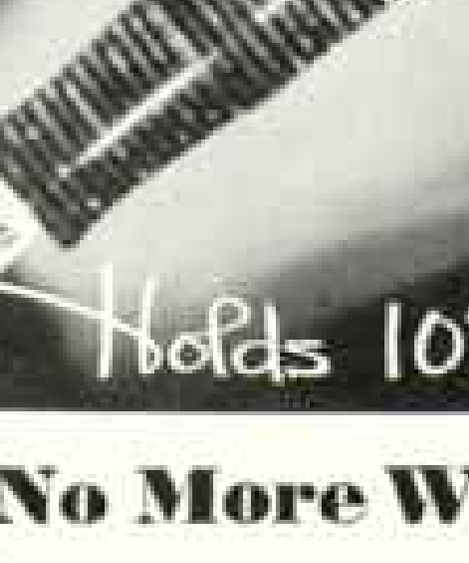
That's why millions of people are replacing their present pens with this revolutionary new Parker Vacumatic with visible ink supply and 102% more of it.

Students, salesmen, court reporters, stenographers and executives now write with untroubled brains, for by holding this miracle writer to the light they can see the ink level—see days ahead if it's running low.

In the great style centers of the world—Hollywood, New York, London, Paris, everywhere—the Parker Vacumatic is the fashionable gift. It is laminated—built up ring upon ring of shimmering Pearl and Jet—smart, velvet-like, wholly exclusive.

This sacless marvel holds enough ink to write 12,000 words because it eliminates 14 old-time parts. It contains no rubber sac found in sac-type pens—no squirt-gun piston pump like other sacless pens—nothing to render it useless later on. That's why it is guaranteed mechanically perfect.

Go to any good pen shop, department, stationery, jewelry, or drug store and try it yourself. The Parker Pen Co., Janesville, Wis.



Parker
VACUMATIC

Junior, $5; Over-Size, $10 — $7.50 — Pencils, $2.50 and $3.50

Note: Write for 20,000-word Trial Bottle of Parker Quink FREE—the new ink that cleans any pen as it writes. Address Dept. 623.

New GENERAL ELECTRIC MONITOR TOP
Universally recognized as the standard of excellence

New GENERAL ELECTRIC FLATOP
The aristocrat of modern cabinet styling

Performance . .

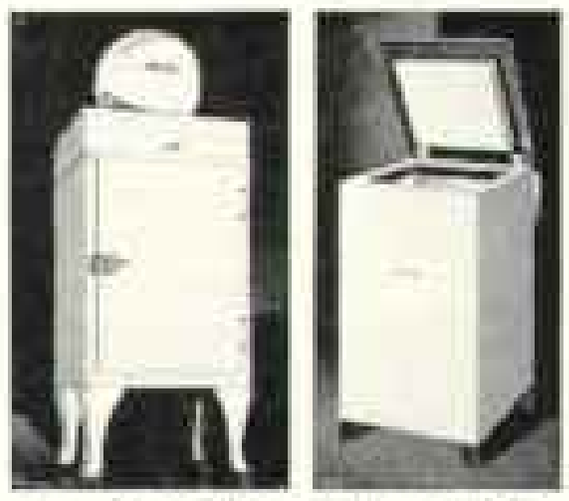
year after year, outweighs in value all other refrigerator features combined . . .

• In buying a refrigerator look to the mechanism *first*. It represents 65% of your investment and determines how long and how well any refrigerator will serve you.

It Costs Less to Own a G-E! Hundreds of thousands of General Electric Monitor Tops now in use six, seven and eight years are still giving the same dependable, trouble-free service they gave the first year.

You pay no penalty of price for the dependable, attention-free performance of a General Electric. Whether your income be $20 a week or unlimited, there is a G-E refrigerator to exactly meet your requirements. All three types, Monitor Tops, Flatops and Liftops, have the "ageless" sealed-in-steel mechanism that requires no attention, not even oiling, and 5 years performance protection *for only $1 a year!*

G-E All-Steel Cabinets are, of course, equipped with all modern convenience features. • *Stainless Steel Super-Freezer that cannot chip or rust* • Sliding Shelves • Temperature Control • Defrosting Switch • Interior Lighting • Vegetable Drawer • Foot-pedal Door Opener • See them at your General Electric dealer's. General Electric Company, Specialty Appliance Sales Department, Section R-6, Nela Park, Cleveland, Ohio.



New G-E MONITOR TOP X4—Specially designed for small homes and apartments.

New G-E LIFTOP—Low price and lowest operating cost.

A dozen G-E models to select from with prices as low as . . $77.50 f.o.b.

GENERAL ELECTRIC

ALL-STEEL REFRIGERATORS

SCHOOLS

that make old age beautiful

A CENTURY ago only twelve Dentists were practicing in this country. Sunken, toothless jaws, rheumatic joints and twisted limbs were the natural, almost inevitable heritage of old age.

Since the first United States dental college was established one hundred years ago, a modern miracle has been wrought. While still too prevalent, these characteristic badges of old age are today largely due to neglect of the Dental Prophylaxis habit. The great dental colleges have developed and given to a great army of Dentists the scientific skill to make old age beautiful.

Medical authorities reveal that more than 85% of bodily ills have their inception in the mouth. Today your ethical Dentist can protect you against many of these diseases by means of an important treatment called Dental Prophylaxis. This involves a thorough inspection and cleansing of the teeth at least every three months in his office. This is something you cannot possibly do yourself—something your Dentist cannot do unless you acquire the Dental Prophylaxis habit and see him regularly.

Don't depend upon any dentifrice to do this. Don't be lulled into a false sense of security by the exaggerated claims often made for dentifrice. Acquire the Dental Prophylaxis habit. See your Dentist every three months. And then help him, by using a safe, honestly advertised tooth paste—one recommended by Dentists.

The American Dental Association maintains a group of scientists known as the Council on Dental Therapeutics. This body carefully tests dental products intended for professional and home use—awarding the "Seal of Acceptance" to those found safe and honestly advertised.

Dentists depend upon it. You, too, may use this dependable guide to the right tooth paste.

Both Iodent No. 1—for teeth easy to Bryten—and Iodent No. 2—for teeth hard to Bryten—bear this coveted A.D.A. Seal of Acceptance. And by continuing to make Iodent the safest and most effective tooth paste scientific skill can produce, we shall always strive to merit this Seal—our most prized possession.

IODENT

ROOMS HARD TO HEAT IN WINTER WILL BE SWELTERING THIS SUMMER

Make your home up to 15° Cooler this summer—save up to 35% on Fuel in winter with J-M Home Insulation.

FREE BOOK TELLS HOW!

J-M ROCK WOOL, blown into attic-floor spaces and hollow walls, keeps precious heat from leaking out in winter—shuts out unwanted heat in summer.

WERE the rooms in your house cold, drafty, hard to heat last winter—were your fuel bills excessive? If they were, it was probably because your walls and roof leaked heat like a sieve and you were trying to heat "all outdoors."

And houses like that are *sweltering* in summer. For where precious heat leaks *out* in winter, unwanted heat seeps *into* a house in summer. Now this can be corrected.

Thousands of home owners have stopped this waste and discomfort with J-M Rock Wool Home Insulation. Rock Wool (rot-proof, fireproof), when blown into empty attic and wall spaces, provides a barrier against heat and cold equal to a solid stone wall eleven feet thick.

YOU CAN FINANCE THE JOB through the Johns-Manville "$1,000,000-to-Lend" Plan—under the terms of the National Housing Act—*the lowest terms in history of home financing.* You'll be surprised how much more *comfortable* Rock Wool will make your house . . . and how quickly it will pay for itself in actual fuel savings!

JM JOHNS-MANVILLE

Rock Wool **HOME INSULATION**

SEND FOR FREE BOOK

Johns-Manville, Dept. NG-6, 22 E. 40th St., New York. Send me valuable free book on Rock Wool Home Insulation, telling how I can make my home up to 15° cooler in summer, save up to 35% on fuel in winter.

Name_____

Address_____

City_____ State_____

SEE HOW NEW KIND OF OIL SAVES YOU MONEY 3 WAYS

—BY ELIMINATING STUCK VALVES AND LEAKY PISTON RINGS!

NEW-TYPE PENNSYLVANIA OIL..

1. Cuts oil consumption up to 50%
2. Saves up to 15% on gasoline
3. Cuts valve and piston ring troubles 75 to 90%

ORDINARY motor oils can't stand the increased speeds and higher temperatures of today's new-type engines. This is because these oils contain damaging elements that break down under high engine heat and cause *sludge*. This collects on valves and piston rings . . . wastes power, oil and gas . . . sends cars to the repair shop often.

But now comes New Pennzoil, refined by a revolutionary solvent process that *removes* these sludge-forming elements—and saves you money these 3 ways: *First*, with sludge-forming elements removed, New Pennzoil cuts valve and piston ring repairs 75 to 90%—there is no sludge to cause valves to stick or piston rings to leak. *Second*, with sludge eliminated, New Pennzoil's tough film is *tougher*—doesn't burn up under engine heat—cuts oil consumption up to 50%. *Third*, because valves and piston rings work freely, you get better compression, power, speed, pick-up. You save up to 15% on gasoline!

Note how *sludgy deposit from plain* oil has formed on (A) valves (B) piston rings, causing them to stick and leak. Compare with *clean* valves (C) and clean piston rings (D), lubricated with New Pennzoil. No sticky valves . . . no leaky piston rings.

New Pennzoil costs nothing extra—get it today from any bonded Pennzoil dealer. Just ask for the correct grade of New Pennzoil for *your* car.

SALESMAN CUTS HIS OIL CONSUMPTION 57%

Reports Big Savings on Gasoline, too

"I had to cut my driving costs," says Mr. Harry W. Iversen, salesman, of 6701 Colonial Road, Brooklyn, N. Y. "With New Pennzoil, I actually use less than half the oil I formerly used. I'm getting at least 2 miles more per gallon of gas. And no valve or piston ring repairs!"

TOUGH-FILM

New PENNZOIL

THE OIL THAT GOES FARTHER . . . FASTER . . . SAFER

BONDED PENNZOIL DEALER
100% Pure Pennsylvania
PENNZOIL
Safe Lubrication

Member Penn Grade Crude Oil Assn. Permit No. 8

The PENNZOIL CO.
Executive Offices:
Oil City, Pa.
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Over your head put the solid steel protection of the "TURRET TOP" Body by Fisher *now featured on Chevrolet (Master De Luxe series), Pontiac, Oldsmobile, and La Salle, closed cars, for 1955*

"Happily ever after"

Whether you are selecting a partner for life, a corsage for the moment, or a motor car for a period of years, good taste and good judgment form the foundation for sound choice. Time has taught the world that there can be no happier choice among automobiles than one with a Body by Fisher. That is because, by any standard you set —whether rugged strength, authentic beauty, luxurious comfort, superb craftsmanship or solid safety—you will find in Body by Fisher not only surpassing value but lasting satisfaction.

BODY by FISHER — GM — GENERAL MOTORS

BODY BY FISHER on GENERAL MOTORS CARS ONLY:
CHEVROLET · PONTIAC · OLDSMOBILE · BUICK · LA SALLE · CADILLAC

The shortest route to

AMERICA'S EXPOSITION

San Diego, California

Our Sunset Limited via New Orleans and the romantic Old South and Golden State Limited from Chicago via El Paso and Southern Arizona provide the most direct, air-conditioned Pullman service to San Diego (America's Exposition, May 29 to November 11). The route is through Carriso Gorge, and Agua Caliente in Old Mexico.

We suggest that you go on the Sunset Limited or Golden State Limited. See San Diego and Los Angeles. Then up the coast to San Francisco and return on our famous Overland Limited or Pacific Limited straight across the continent, following the trail of the Covered Wagons and crossing Great Salt Lake. Or continue up to the evergreen Pacific Northwest on our Cascade and return on a northern line. In any case, *go one way, return another* and see twice as much of the West. Very low summer roundtrip fares are on sale every day until November 10.

Sunset Limited, Golden State Limited, Overland Limited, Cascade and Pacific Limited are completely air-conditioned this summer. For free booklet on the San Diego Exposition and detailed information about a trip West, write O. P. Bartlett, Southern Pacific, Dept. C-6, 310 South Michigan Boulevard, Chicago.

Southern Pacific

HERE are typical comments about Southern California which recent visitors have made in letters to this non-profit community organization:

INDIA: "After several weeks' stay in Southern California, I can frankly state that this is one of the ideal playgrounds of the world."
—*His Highness, Sir Ibrahim, Sultan of Johore.*

NEW YORK CITY: "...wonderful state with very fine roads, wonderful scenery and courteous people..."—W.C.R.H.*

LOUISVILLE, KY.: "My stay in Los Angeles can hardly be described in words. We were so delighted with our trip that arrangements will probably be made shortly to make us permanent residents of Los Angeles..."—C.A.R.

BIRMINGHAM, ALA.: "I found all that your literature promised and more...hope to go again..."
—W.G.M.

NORTH COLLEGE HILL, OHIO: "...most wonderful trip we ever had, and we make one each year..."—C.A.

HIBBING, MINN.: "I took a 7500 mile trip... Southern California had the best roads of any place we went..."—R.M.C.

OXFORD, IA.: "Expenses much below other trips I have taken..."—A.H.S.

LONDON, ENGLAND: "Your climate is probably the best in the world..."
—*Sir Frederick O'Conner.*

Transportation has been speeded up and costs reduced so that a Southern California trip requires no more time and money than most ordinary, close-to-home vacations. Yet its mountains, beaches, sports, Missions, and fascinating places like Hollywood, Los Angeles, Pasadena, Glendale, Long Beach, Santa Monica, Beverly Hills, Pomona and scores of others can give you stimulating experiences and memories you'll treasure always.

Free automatic trip planner

Your Southern California trip plans itself through this unique new book which gives you the whole story from the time you leave home till you're back again: What to see and do, 100 pictures, maps, itemized costs, free routing from your home, etc... information not available elsewhere.

* Names on request. Names reproduced here only when specific permission to do so was included in letter.

ALL-YEAR CLUB OF SOUTHERN CALIFORNIA

Come for a glorious vacation. Advise anyone not to come seeking employment, lest he be disappointed; but for tourists, the attractions are unlimited.

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All-Year Club of Southern California,
Dept. F.6, 1151 So. Broadway, Los Angeles, Calif.

Send me free book with complete details (including costs) of a Southern California vacation. Also send free routing by ☐ *auto,* ☐ *rail,* ☐ *plane,* ☐ *bus,* ☐ *steamship. Also send free booklets about counties checked:*

☐ Los Angeles ☐ Orange ☐ Riverside ☐ Ventura
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Name _____

Street _____

City _____ *State* _____

★ SEE AMERICA'S EXPOSITION • • SAN DIEGO, MAY 29 to NOV. 11 ★

For sitting on top of the world . . . may we suggest a Silent Corona!

What better GRADUATION GIFT than one you can take with you anywhere through life?

A VACATION in the West will be more of a treat than ever this summer. Here's the good news: **Union Pacific** has air-conditioned every car on its principal trains! Result: Cool, clean, washed air—no dust or dirt. In short, perfect travel "weather" all the way.

BUT that's only a start. **Union Pacific** serves more of the Vacation-West than any other railroad. This includes Southern Utah's Zion, Bryce and Grand Canyon National Parks; Yellowstone's Land of Magic; cool Colorado; California; Pacific Northwest and Alaska; the Western Dude Ranch country.

COULD you ask for a finer "assortment" from which to choose? And note this: Rail fares were never lower. So go West this summer in air-conditioned **Union Pacific** trains. You'll enjoy every mile of your trip. Coupon brings full information.

UNION PACIFIC

W. S. Basinger, Passenger Traffic Manager
Room 211, Union Pacific Railroad, Omaha, Nebr.

Please send me information about.....

Name .....

Street.....

City..... State .....

☐ Also tell me about economical, all-expense tours.

Towels you don't have to WASH!

Bacon tastes crisper when you drain off the grease on a "thirsty" ScotTowel.

These pure white Paper Towels are always fresh, clean and ready to use

HERE'S a new convenience for your kitchen. A roll of ScotTowels fastened right above the sink! Something spilled on the table, bacon to drain, greasy pans to clean, glasses to polish—just reach for a ScotTowel. Use it. Then throw it away. Nothing to wash or rinse! Made of "thirsty fibre," ScotTowels are *twice as absorbent* as ordinary paper towels. They *really* dry. 2 big rolls cost only 25¢ at grocery, drug and department stores. Or, write Scott Paper Co., Chester, Pa.

Use ScotTowels for:

Mopping up spilled liquids
Cleaning greasy pans
Polishing mirrors
Wiping off clotheslines
Drying vegetables
Wiping milk bottles
Draining lettuce
Cleaning the icebox
Wiping sink
Drying hands

150 towels per roll

INTRODUCTORY OFFER

SCOTT PAPER COMPANY, CHESTER, PA.

If your dealer does not sell ScotTowels, send us 50c (money or stamps) and you will receive postage paid—

2 ROLLS OF SCOTTOWELS, AND 1 ENAMELED FIXTURE
or SEND $1.00 FOR 6 ROLLS AND ONE FIXTURE

Check color of towel fixture desired: ☐ ivory ☐ pale green

Name_____

Address_____

Dealer's Name
and Address_____

M-6

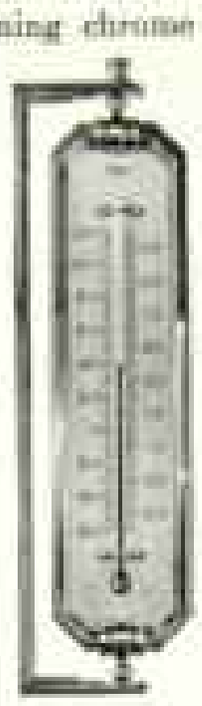
Rice for the BRIDE

a diploma for the "GRAD"

BUT long after the rice has disappeared and the graduate has put away his (her) diploma, your gift of a Taylor Thermometer or Weather Instrument will remain as a steadfast friend and daily guide. An unusual gift, yes. But practical and attractive. An accurate adviser on clothes to wear outdoors . . . on comfort indoors, on what to do tomorrow . . . on the cooking of food. So make your gift a "gift from Taylor." The name on the thermometer or weather instrument is your guarantee of superlative quality — like "Sterling" on silverware. Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada.

FOR THE BRIDE — FOR THE "GRAD"

A practical guide to dressing for outdoors—Taylor Window Thermometer. Shining chrome frame and bracket. Adjustable. Large, easy to read figures. Weatherproof. Price, $5.50.



This Taylor (Fairfax) Stormoguide warns hours in advance whether it will be clear, cool, stormy, windy. For mantel or desk. Price $10.

A beautiful gift—this Taylor Standing Thermometer—satin black finish, blue lacquered scale, white metal trim, scroll base. Price, $1.75.

Fine gift for embryo scientists. This "Admiral Byrd Set" contains compass and altimeter. Pocket-size case. $50.00 at leading department or optical stores.

(Prices slightly higher west of Rockies and in Canada.)

IDEAL FOR BRIDE'S SHOWER

Taylor Cooking thermometers for baking, roasting, deep frying, candy and jelly-making.

Taylor

INSTRUMENTS

IN INDUSTRY, other types for indicating, recording and controlling temperature, pressure and humidity.

$1 BRINGS YOU THIS BIG BARGAIN

The 450 package

AN AMAZING value in fine stationery — 300 sheets and 150 envelopes (450 pieces) for $1.00! This is at the rate of 30 sheets and 15 envelopes for 10c. All printed with your name and address!

Only high grade paper is used—a pure white, ***rag content bond paper***— It doesn't "blot," it doesn't "scratch." It is correct note sheet size, 6" x 7", with envelopes to match.

We print your name and address or any "form" that does not exceed 4 lines, 30 characters per line, on both sheets and envelopes in attractive dark blue ink. Your package mailed within 3 days of receipt of order. We have no agents or dealers. All orders mailed direct from our plant in Peru, Indiana, postage prepaid. Send $1.00 for a trial package ($1.10 west of Denver, Colo., and outside of U. S.). You can't lose because —

Absolute satisfaction guaranteed, or your money promptly refunded.

THE AMERICAN STATIONERY CO.

300 PARK AVE. **PERU** INDIANA

"THE BEST IS YET TO BE"

NEW ENGLAND MUTUAL NOW OFFERS YOU
A HAPPIER PLAN FOR LIVING

TO CELEBRATE its Hundredth Anniversary, New England Mutual introduces the Multiple Income Policy, a type of insurance entirely unique.

This policy, to an extent never before achieved, answers all the needs of any man who wants to safeguard the future for his wife, for his children and for himself.

With this policy he can provide his family with a definite income, continuing month by month. He can assure his children of a home and education and care until they are fully grown, thus banishing permanently the fear that they shall ever be dependent upon others. And he can, in addition, guarantee to his wife and himself a financial security that will transform the latter half of life into a prolonged, carefree vacation.

The Multiple Income Policy is an important innovation. It represents a new thought in the insurance business. It combines, for the first time, the finest features of family income and old age security. It is the ultimate in protection; and is of utmost importance in any plan to safeguard the future.

This new step in the progress of insurance protection is an achievement of the Company whose name is synonymous with safety, the Company operating under a Charter granted in 1835—*the first Charter granted to a mutual life insurance company in America!*

NG-8

NEW ENGLAND MUTUAL LIFE INSURANCE CO.
87 Milk Street, Boston, Mass.

Please send me further information about the Multiple Income Policy.

Name _____

Address _____

NEW ENGLAND MUTUAL

LIFE INSURANCE COMPANY OF BOSTON

AMERICA'S FIRST CHARTERED MUTUAL COMPANY—AND STILL PIONEERING

SMART RESORTS

Canada's lake, mountain and seaside resorts offer you a wide variety of vacation pleasures.

Vacation in CANADA

MAKE this summer's vacation a trans-Canada tour. You will enjoy every day of exhilarating sunshine—and the cool nights too. You will want to stop over at the swank lake, mountain and seaside resorts, where you can golf, ride, swim, boat or just laze around all day and join in the hospitable social activities of the long evenings.

CANADIAN TRAVEL BUREAU

Ottawa, Canada

WRITE and tell us just what kind of a vacation you would like, or call at your nearest Canadian railway or steamship office—we'll be glad to help you plan your vacation in Canada.

No Red Tape at the International Border

Luxurious steamers plying Canada's inland and coastal waters offer you a delightful holiday. NOC4833

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the Old Historic Province of Québec

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Visit Québec this year!

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En Route to the Historic Province of

QUÉBEC

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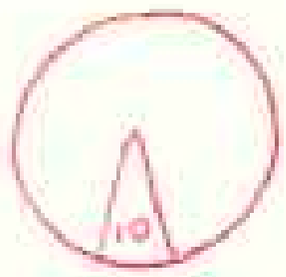
QUÉBEC, CANADA

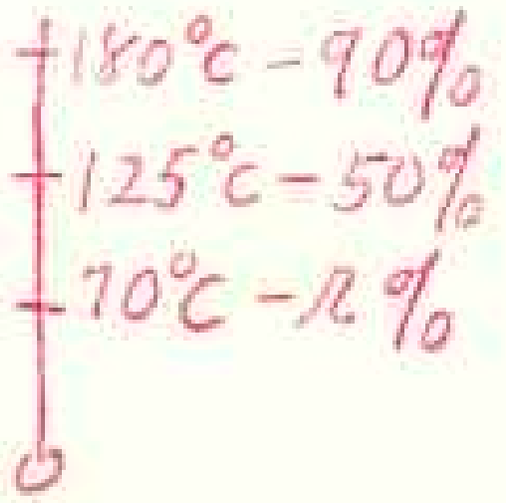
Forma pstand descriptive literature, apply to your home travel agency, automobile club, Chamber of Commerce, railway, steamship or bus office; or write Roads Dept., Québec City, Canada.



10%

257°F

vapor pressure?
distillation range?
octane rating?



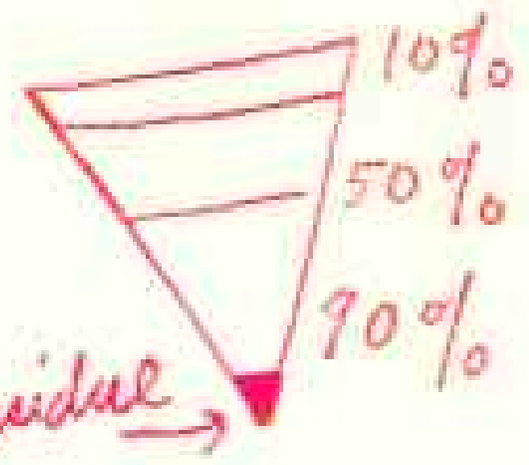
6.71
.20
1.3420

X2468 = R
m

37.8
10 lbs

corrosion
method 530.22

122°F



√76

6X+8

Let the government do this figuring.

One single fact about gasoline is enough for the average motorist to know.

y=1,361

It is this:

The regular Texaco Fire-Chief gasoline that you have in your tank surpasses U. S. Government specifications* for *emergency* gasoline.

*Federal Specification VV-M-171

The National Geographic
DIRECTORY OF COLLEGES, SCHOOLS, AND CAMPS

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CULTURAL and Professional study. Music, dancing, dramatics, languages, creative writing, art, secretarial. Resid. tial. **Mr. and Mrs. August King-Smith, Directors, 1737 New Hampshire Avenue, Washington, D. C.**

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A COUNTRY school with high academic standing. Junior High. College preparatory. Special training for C. E. B. examinations. Two-year advanced diploma courses. Art, Music, Drama. Sports. **Mrs. E. Russell Houghton, Box N, Cooperstown, N.Y.**

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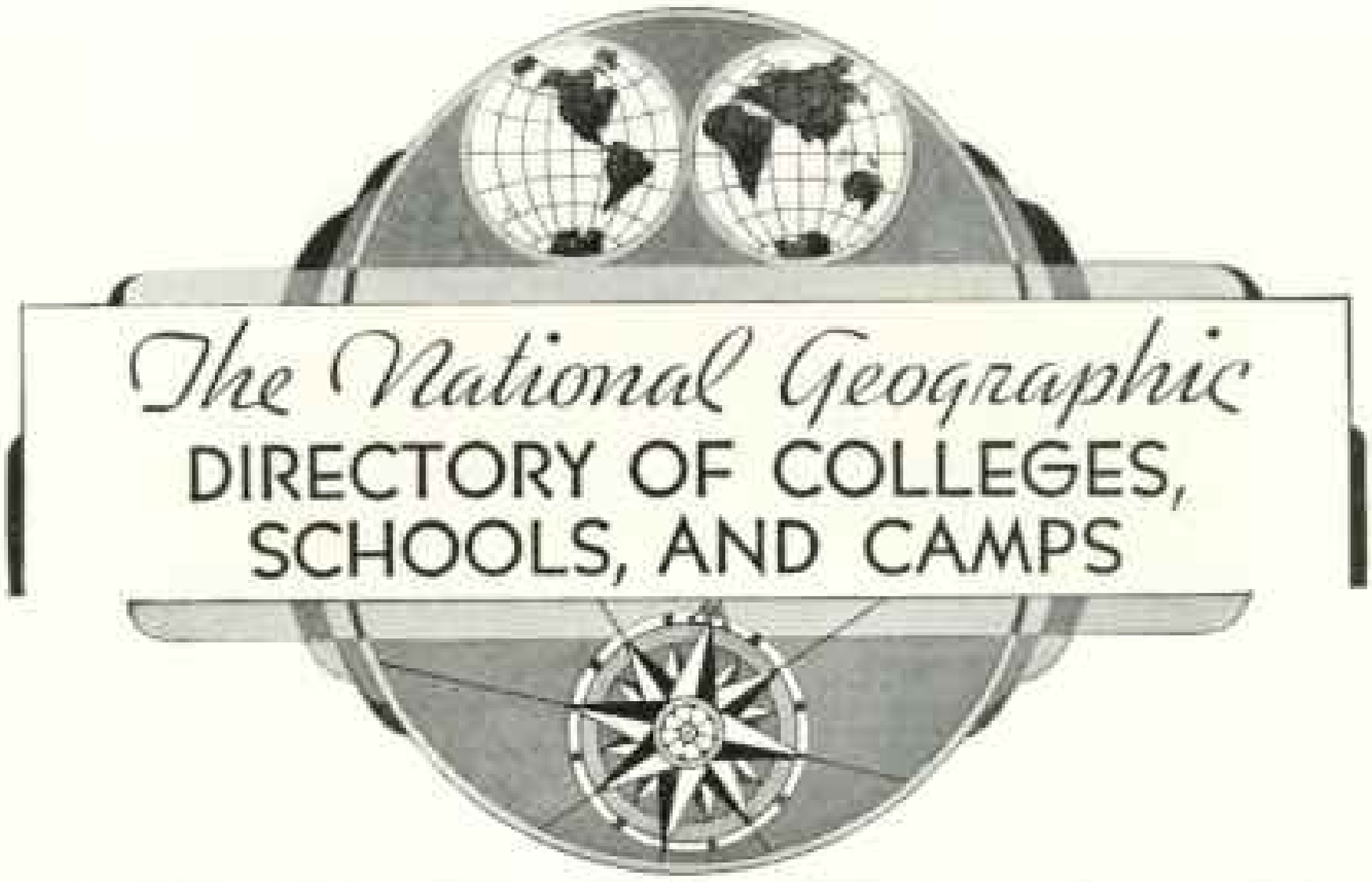

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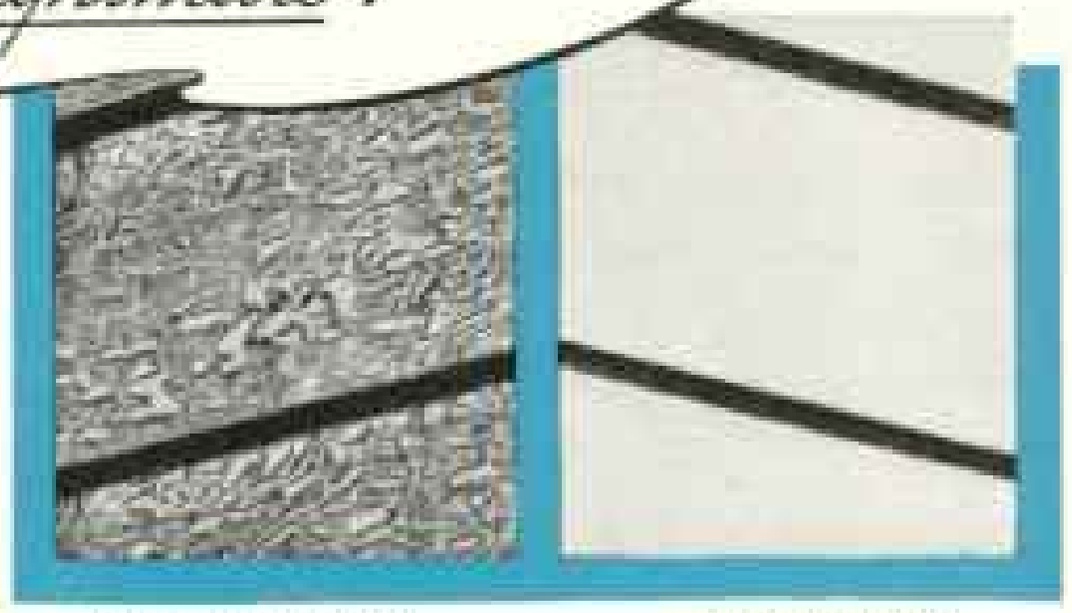

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First coat, $100. Paint is "all done" right now. Cost to burn and scrape off, $75. Total, $175, or $116 per year. And add to this the extra cost of a new priming coat.

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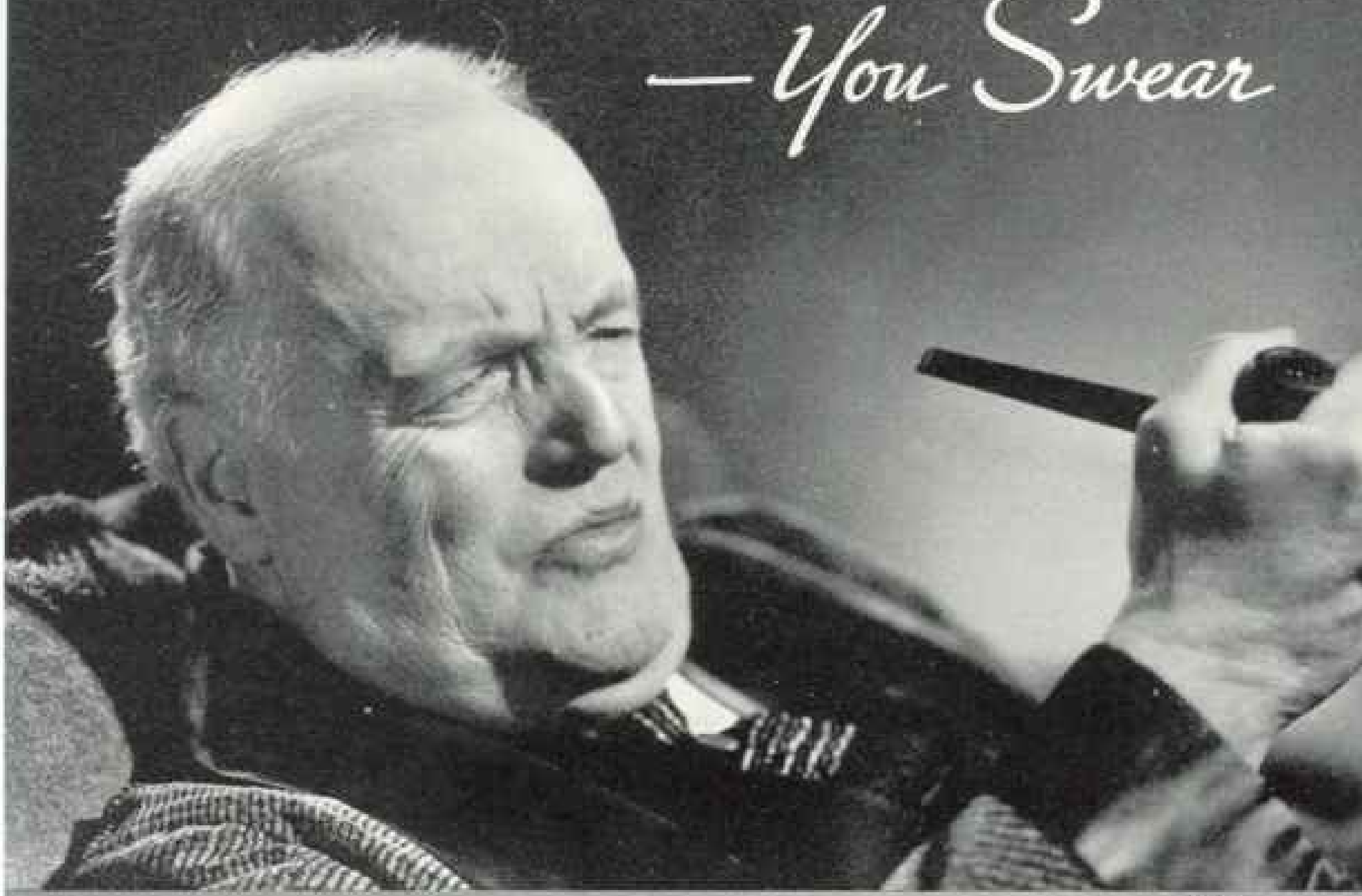

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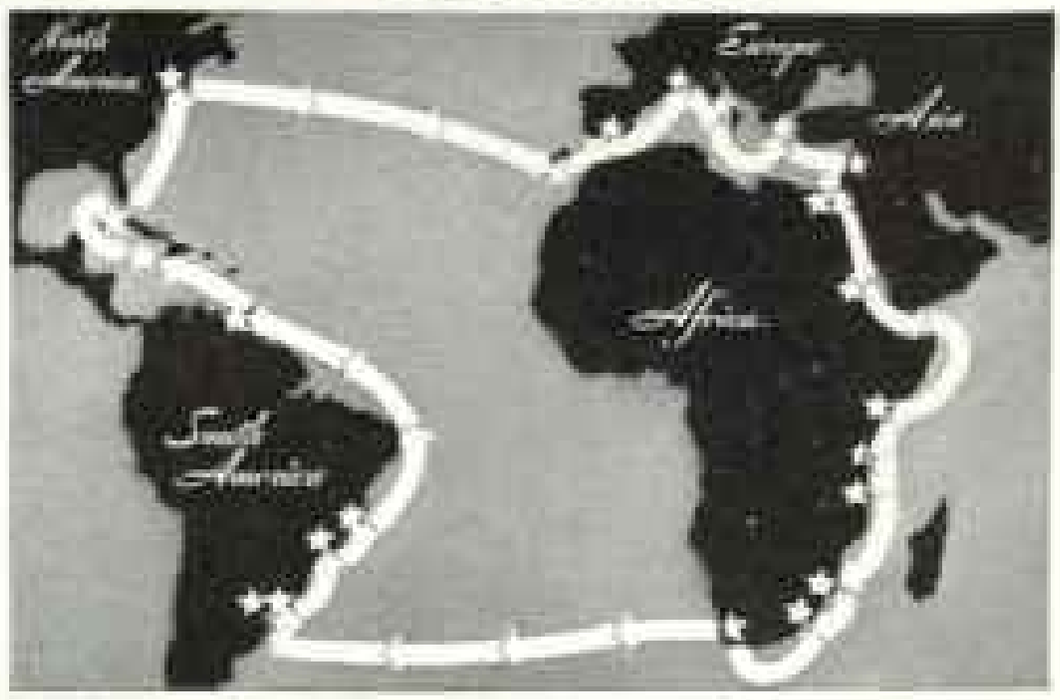

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"I Want to Take a Sea Trip"—

CRUISES IN AMERICAN WATERS, JUNE 10 TO JULY 9

This Sailing List is published by the Advertising Department of The National Geographic Magazine as an aid to readers contemplating a sea voyage. Routes as well as sailing dates are *subject to change* and can not be guaranteed. Before plans are concluded a *travel agent* should be consulted for latest authentic information. Consult the agent also for booklets and tickets. The National Geographic can NOT supply them.

* The star denotes a steamship line whose advertising appears in this issue of The Geographic. † Leave Boston. ‡ Leave Philadelphia. All others leave New York.

Leave New York	Days	Steamship Line	Route (See list below)	Ship
June†11	12	Standard Fruit	22	Gatun
June 12	6-13	New York & Cuba Mail	4	Orizaba
June 13	11-18	Colombian	23	Colombia
13	17	*Dollar	2	President Adams
13	11	New York & Porto Rico	12	Borinquen
13	12	United Fruit	7	Quirigua
June 14	23	*American Caribbean	23	Seminole
14	19	*Grace	3	Santa Rita
14	6-21	Royal Netherlands	15	Sturvesant
16	24	Royal Netherlands	28	Amor
June 17	28	Canadian National	24	Lady Rodney
17	29	*Furness Prince	16	Western Prince
17	18	Munson	5	Munargo
18	19-30	New York & Cuba Mail	11	Mooney
18	9	Panama Pacific	6	Virginia
15	13	Standard Fruit	17	Castilla
15	18	United Fruit	8	Calamares
June†19	13	Standard Fruit	23	Granada
June 19	6-13	New York & Cuba Mail	4	Orizaba
19	21	Red "D"	6	Caracas
19	14	Southern Pacific	22	Dixie
June 20	11-18	Colombian	23	Haiti
20	24	*Dollar	1	President Cleveland
20	4	*French	24	Lafayette
20	11	New York & Porto Rico	12	Ciamo
20	18	United Fruit	7	Peiro
June 21	24	Royal Netherlands	26	Astrea
June 22	17	*Grace	13	Santa Elena
23	39	*Grace	13	Santa Maria
22	41-55	Munson	20	American Legion
22	18-34	New York & Cuba Mail	11	Yucatan
22	13	Standard Fruit	17	Atlantida
23	18	United Fruit	9	Tulsa
June†23	14-28	Canadian National	21	Lady Hawkins
June†23	13	Standard Fruit	25	Gatun
June 26	21	Red "D"	6	Lara
June 27	11-18	Colombian	23	Pastores
27	17	*Dollar	2	President Harrison
27	8-26	New York & Cuba Mail	11	Orizaba

Leave New York	Days	Steamship Line	Route (See list below)	Ship
June 27	11	New York & Porto Rico	12	Borinquen
27	17	United Fruit	7	Verugua
June 28	2-5	Eastern	21	Florida
28	17-29	Royal Netherlands	15	Cottica
28	24	Royal Netherlands	28	Flora
June 30	28	Canadian National	24	Lady Somers
30	30	*Furness Prince	16	Southern Prince
21	23	Furness West Indies	14	Sarina
21	20	*Grace	3	Santa Barbara
20	12	Munson	5	Monarch
29	7-11	New York & Cuba Mail	4	Orizaba
29	6	Panama Pacific	6	Pennsylvania
30	13	Standard Fruit	17	Castilla
29	18	United Fruit	8	Ulua
29	31	Furness Bermuda (Cook)	27	Queen of Bermuda
June†29	23-28	Canadian National	24	Lady Drake
July‡ 2	15	Standard Fruit	23	Granada
July 2	23	*American Caribbean	23	Haiti
2	8	Eastern	22	Arauca
3	21	Red "D"	6	Caracas
July 4	11-18	Colombian	23	Colombia
4	18	*Dollar	1	President Lincoln
4	3-9	Eastern	21	Florida
† 4	2-5	Eastern	22	St. John
4	11	New York & Porto Rico	12	Ciamo
4	6	Panama Pacific	1	Columbia
4	17	United Fruit	7	Quirigua
July 6	10-25	New York & Cuba Mail	11	Mooney
July 9	13	Cunard	29	Olympic
9	17	*Grace	13	Santa Paula
9	20	*Grace	13	Santa Lucia
9	11-53	Munson	20	Western World
9	7-11	New York & Cuba Mail	4	Orizaba
9	24	Royal Netherlands	26	Lima
9	13	Standard Fruit	17	Atlantida
9	18	United Fruit	8	Calamares
July 9	4	Cunard	30	Georgic
9	7	Panama Pacific	30	Columbia
July† 9	13	Standard Fruit	25	Gatun

ROUTES

1 Bermuda.
2 Havana, Panama.
3 Panama, Callao, Valparaiso, Guayaquil.
4 Havana.
5 Nassau, Miami, Havana.
6 San Juan, La Guaira, Puerto Cabello, Curaçao.
7 Havana, Kingston, Cristobal, Port Limon.
8 Kingston, Cristobal, Cartagena, Puerto Colombia, Santa Marta.
11 Havana, Progreso, Vera Cruz, (Mexico City).
12 San Juan and Santo Domingo.
13 Haiti, Jamaica, Colombia, Panama.
14 St. Thomas, St. Croix, St. Martin, St. Kitts, Antigua, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, Barbados, Trinidad, Demerara.
15 Port au Prince, Curaçao, Puerto Cabello, La Guaira, Guanta, Puerto Pilar, Pampatar, Carupano, Trinidad, Demerara, Paramaribo.
16 Rio de Janeiro, Santos, Montevideo, Buenos Aires, Trinidad.
17 Santiago, Kingston, La Ceiba.
18 Cartagena, Puerto Colombia, Panama Canal, La Libertad, San Jose, Mazatlan, Los Angeles, San Francisco.
19 Kingston, Panama Canal, Buenaventura, Guayaquil, Salaverry, Callao, Valparaiso, Havana.
20 Bermuda, Rio de Janeiro, Santos, Montevideo, Buenos Aires, Trinidad.
22 Bermuda, St. Kitts, Nevis, Antigua, Montserrat, Dominica, St. Lucia, Barbados, St. Vincent, Grenada, Trinidad, Demerara.
23 New Orleans.
25 St. Thomas, St. Croix, St. Kitts, Antigua, Guadeloupe, Martinique, St. Lucia, Barbados, Trinidad, Paramaribo, Demerara, Grenada, St. Vincent, Dominica.
24 Bermuda, Nassau, Kingston.
25 Key West, Progreso.
26 Haiti, Venezuela, Curaçao.
27 Nassau, Kingston, Curaçao, Rio de Janeiro, (Buenos Aires), Santos, Trinidad; Santo Domingo.
28 Boston, Quebec.
29 Quebec, Saguenay, Murray Bay, Gaspé, Nova Scotia, Bermuda.
30 Halifax.
31 Portland, Bar Harbor.
32 Yarmouth, Digby, St. John.

REGULAR SAILINGS FROM AMERICAN PORTS

(From New York unless otherwise indicated)

Alaska Line	8- to 12-day cruises from Seattle to Aleutian ports.
American Export Lines	42- to 75-day cruises to Mediterranean ports.
American Mail Line	18- and 68-day cruises from Seattle to Japan, China and the Philippines.
*American Scantic Line	Weekly to Sweden, Poland, Russia, Denmark, Finland.
*American South African	Monthly sailings to South Africa.
Anchor Line	To Ireland and Scotland.
Baltimore Mail Line	From Baltimore and Norfolk to England, France and Germany.
Arnold Bernstein Line	To England, France and Belgium.
*Canadian Pacific	Round-the-world sailings . . . From Montreal to England, Scotland, Ireland and France . . . From Vancouver via Hawaii to Japan, China and the Philippines . . . From Vancouver to Alaska . . . From Vancouver via Hawaii and Fiji Islands to New Zealand and Australia.
Clyde-Mallory Line	To Charleston, Jacksonville, Miami and Galveston.
Cunard White Star Line	To England, Ireland and France. (Also sailings from Boston and Montreal to Great Britain.)
*Dollar Line	Around the world. Also from San Francisco via Hawaii to Japan, China and the Philippines.
*French Line	To England and France.
*Furness Bermuda Line	To Bermuda.
*Grace Line	From New York, San Francisco and Los Angeles to ports listed on routes 13, 19.
Hamburg-American Line North German Lloyd	To England, Ireland and Germany.
Holland America Line	To England, France and Holland.
*Italian Line	New York and Boston to Gibraltar, French Riviera, Naples, Genoa and Trieste.
Matson Line	From San Francisco and Los Angeles to Hawaii, Samoa, Fiji, New Zealand and Australia.
Nippon Yusen Kaisha	From Seattle and Vancouver to Japan and China.
	From San Francisco and Los Angeles via Hawaii to Japan and China.
Panama Pacific Line	Via Panama to San Diego, Los Angeles and San Francisco.
States Steamship Line	From Portland, Oregon, to China and the Philippines.
United States Lines	To England, Ireland, France, Germany.

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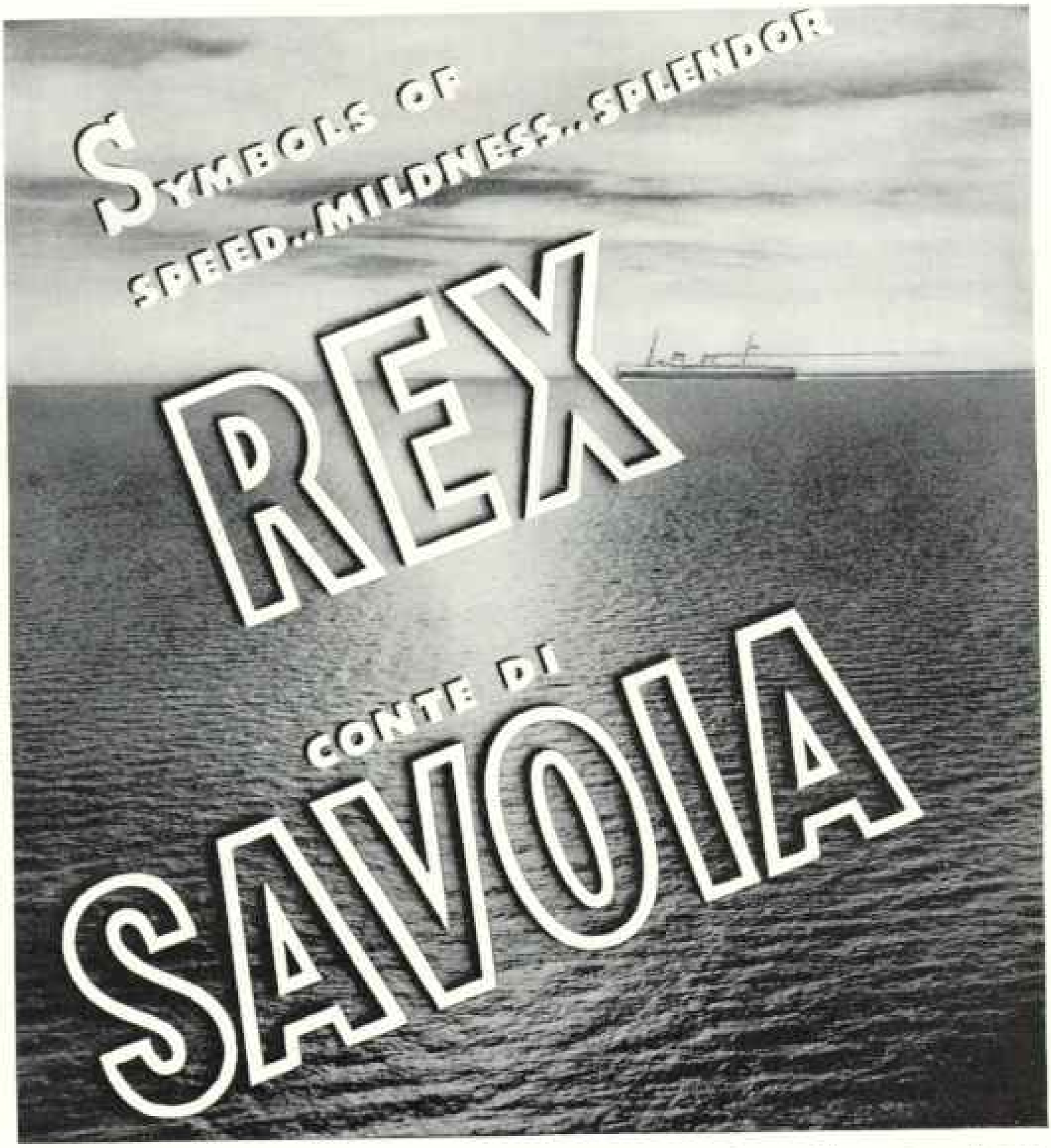

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That's why you'll be glad you're aboard a "Prince," traveling Furness. You'll be particularly glad to go down to meals, for each is so varied, fresh and appetizing. You'll be glad of the British atmosphere, from stem to taffrail. You'll be glad your cabin steward has had long English training.

The four "Princes," brilliant motorships built recently, offer the speediest schedule to the modern world of the East Coast, with its rich capitals—Rio de Janeiro, Santos, Montevideo and Buenos Aires. They provide nothing but First Class accommodations, with Furness traditions of service and seamanship.

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National Geographic Society

WASHINGTON, D. C.

June 1, 1935

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The new National Geographic Society-U. S. Army Air Corps Stratosphere Flight, foretold in this issue of The Magazine, is a notable example of your Society's constant efforts to increase our knowledge of the world about us. Your Society's income is used to support such important researches, world-wide explorations, and photographic surveys, and to publish the results of these activities in The National Geographic Magazine.

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George Hutchison

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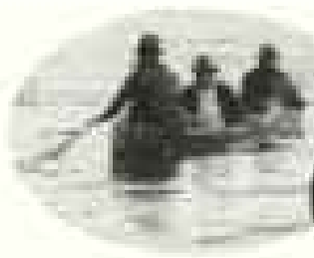

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D-2

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N. G. 28

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National Geographic Society, Washington, D. C.

Department U

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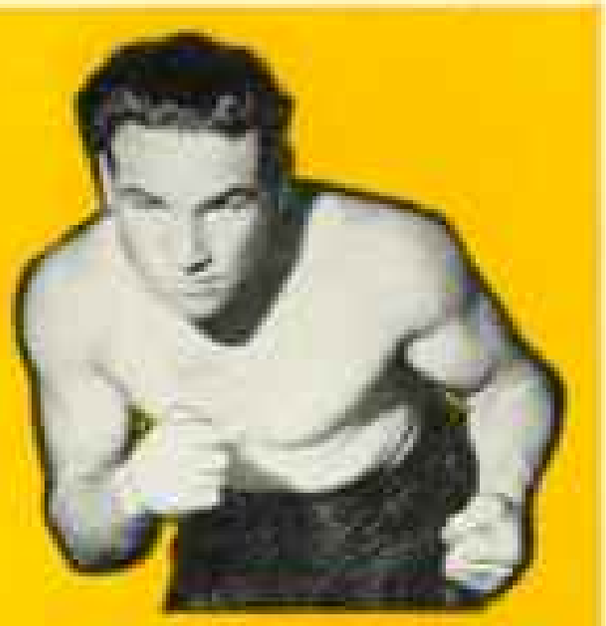
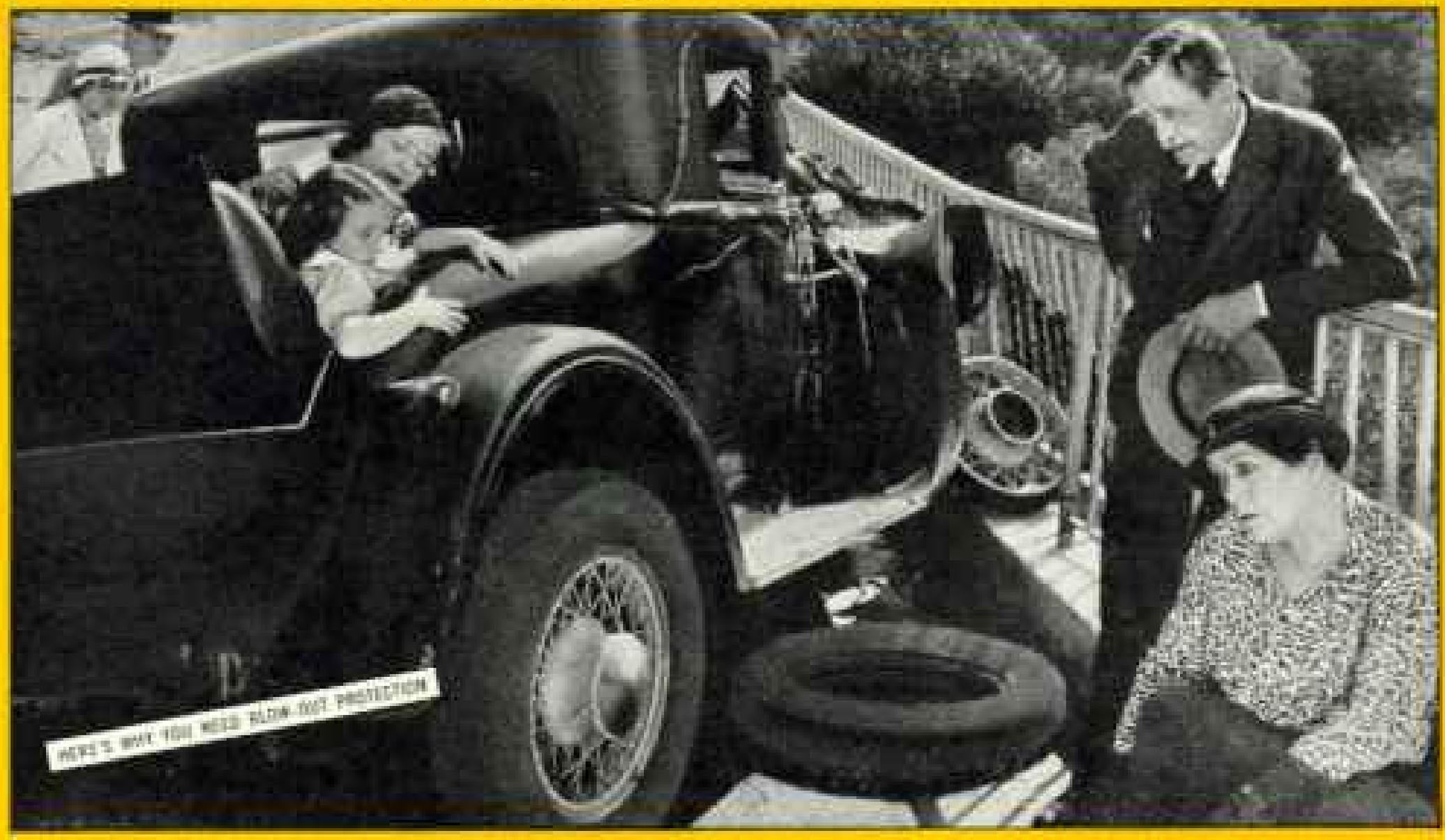


Says JIMMY McLARNIN
POPULAR WELTERWEIGHT



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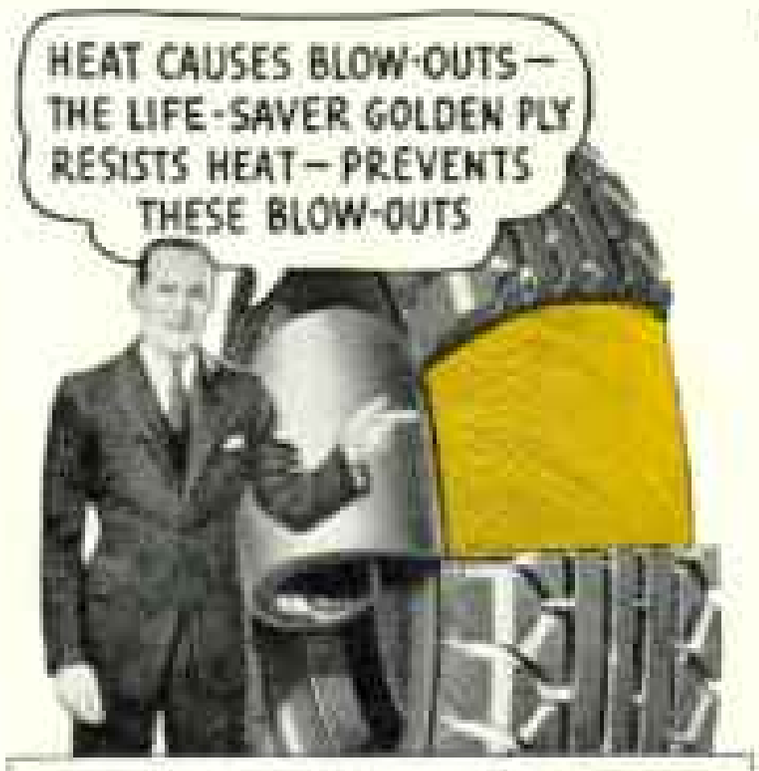

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Today's faster driving generates terrific heat inside a tire. Fabric and rubber separate. A blister starts and keeps growing—until sooner or later, BANG! A blow-out! And it takes plenty of luck to save you. To prevent this great, unseen cause of high-speed blow-outs, every Silvertown has the Life-Saver Golden Ply with a secret Goodrich compound which resists heat—stops high-speed blow-outs before they start.

Another Safety Feature

Goodrich Silvertowns also have an extra-thick, husky-cleated tread that gives you maximum protection against dangerous "tail-spin" skids. If you want the utmost in tire safety and tire mileage—equip your car with *Goodrich* Silvertowns. Silvertowns cost not a penny more than other standard tires.

FREE! Handsome emblem with red crystal reflector to protect you if your tail light goes out. Go to your Goodrich dealer, join Silvertown Safety League, and receive one FREE. Or send 10¢ (to cover packing and mailing) to Dept. 931, The B. F. Goodrich Co., Akron, Ohio.

The NEW **Goodrich** *Safety* **Silvertown**
WITH LIFE-SAVER GOLDEN PLY