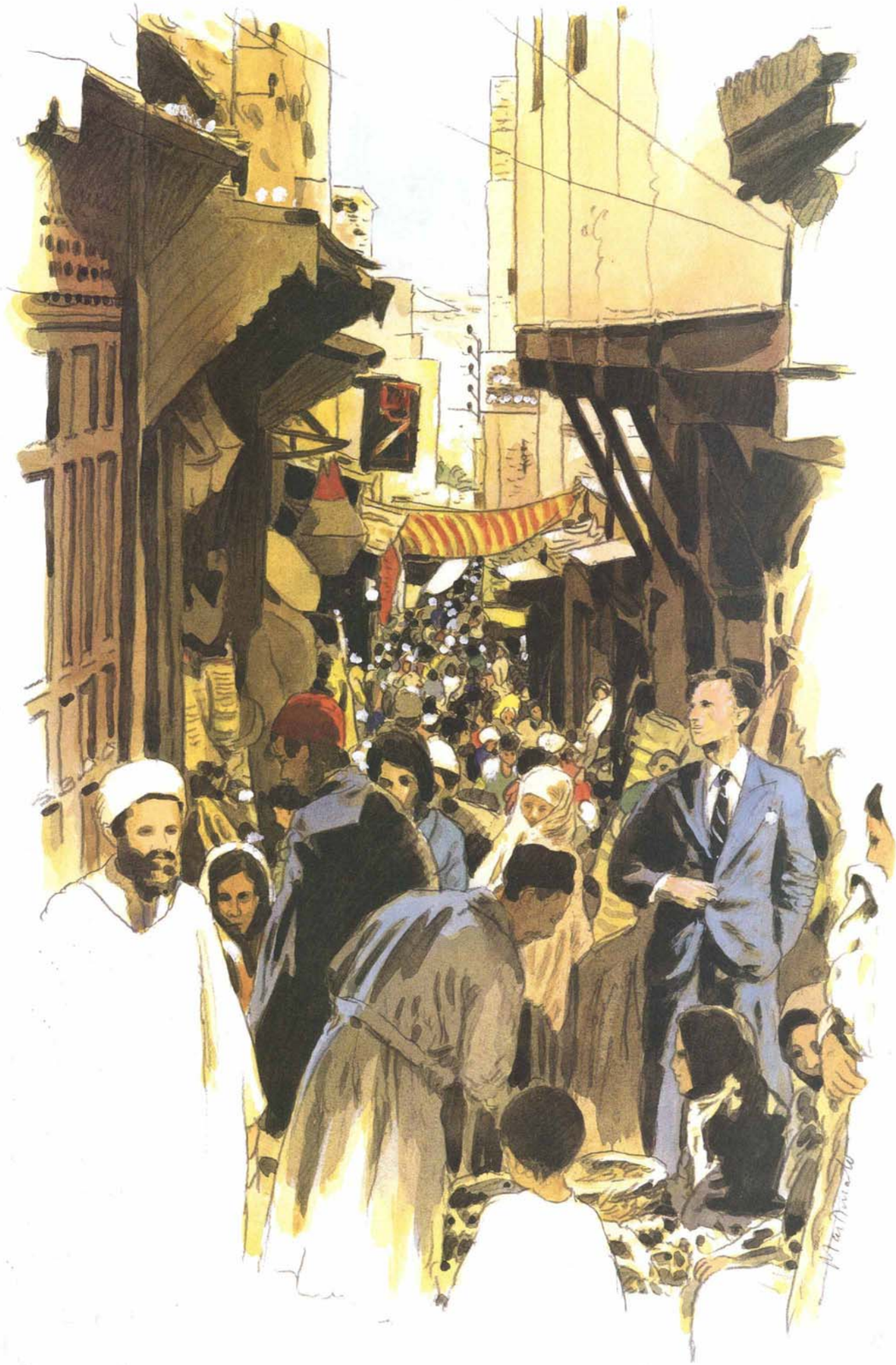

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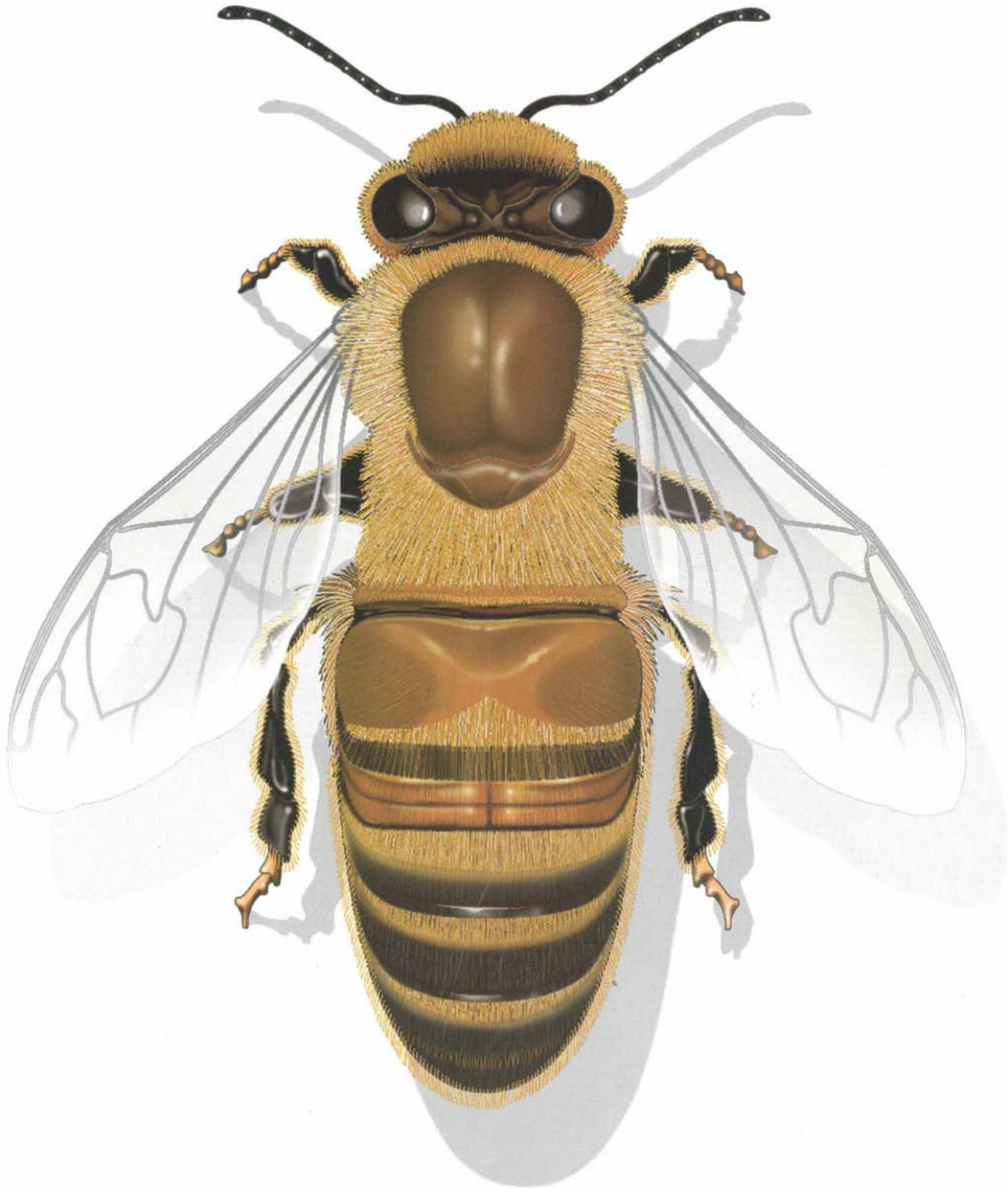

The Beekeepers of Wadi Du'an

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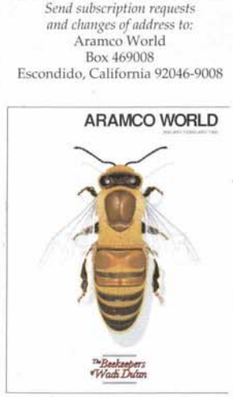

Front cover: The honeybees of Wadi Du'an gather nectar from the buckthorn tree, *Ziziphus spina-christi*, to produce what connoisseurs call the most flavorful honey in the world. Local beekeepers use simple, labor-intensive methods to manage the bees, and reap a precious harvest. Illustration by Tom McNeff. Back cover: George Orwell was a keen observer in the streets of Marrakech, and very conscious of the social implications of what he saw. Illustration by Norman MacDonald.

◀ Marie Balian's lively tile paintings are classical at their roots.

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The Beekeepers of Wadi Du'an

WRITTEN AND PHOTOGRAPHED BY ERIC HANSEN

Standing in the midday sun, surrounded by towering sandstone cliffs, I gazed into a trough made from half of a battered oil drum. It was partly filled with sugar syrup, and on the syrup floated chunks of rubber-sandal soles and a few dead bees. Looking around for the beekeepers' camp, I wondered where they had moved now.

It was mid-November, and at this same spot 12 months earlier, I had eaten lunch with the beekeepers in their tent. But this year, the *ilb*, or buckthorn, trees had flowered earlier than I had expected, and the men had moved on with their tents and hives. My driver, Mohammed al-Osabi, smoked a cigarette and chuckled to himself at my bewilderment. He had just spent two days driving me across 500 kilometers (300 miles) of desert to meet again with the beekeepers of Wadi Du'an.

Wadi Du'an is a remote, little-known valley in Yemen, just south of the Rub' al-Khali, the Empty Quarter of Saudi Arabia. Here, generations of beekeepers have been perfecting their craft for at least a millennium. They work hard, using labor-intensive techniques of managing bees. Combined with the dry climate and short flowering season of local plants, their efforts have helped to produce the most expensive and sought-after honey in the world. The most frequent customers come from Saudi Arabia, and in Wadi Du'an, a two-pound tin of the very best honey in the comb can command a price of $100 or more.

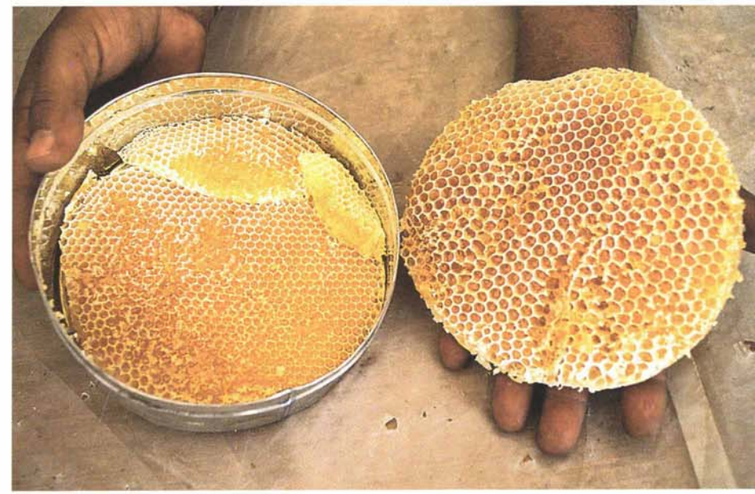
Wadi Du'an produces what specialists call a dry-land, monofloral, wildflower honey, renowned for its unique buttery flavor, rich aroma and high viscosity—and for its medicinal qualities. The honey is thought to be the perfect medicine to help women regain their strength after childbirth. Elderly men maintain that a daily spoonful keeps them young, while young men believe that regular doses will help produce a male heir.

During this morning's drive, I had had plenty of time to mull all this over. A gravel track had taken us past storefronts selling the local honey, and farther out, in the villages, we met turbaned men sitting behind kick-wheels, fashioning mounds of slick clay into cylindrical beehives more than a meter tall.

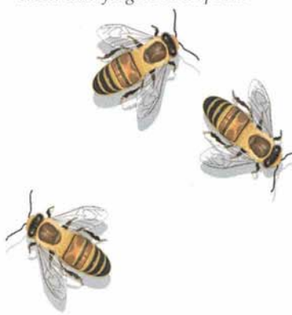
One of the shopkeepers, Islam Ahmed Ba Dhib, had opened tins of honey to let us sample the three different types he had on hand that day. "There are many tests for purity," he said, "but none of them are certain, and, as with friendship, the honey business is based on trust."

The first type he showed us is known to merchants as *bariyah*, "the cream," a winter honey made from buckthorn *(Ziziphus spina-christi)* blossoms. The honey tin—25 centimeters (9") across, the same diameter as the terra-cotta hives—was filled with a double layer of round comb. The heady floral fragrance was unlike any honey I had ever smelled, and the taste

Wadi Du'an, opposite, is actually a network of valleys running north into Wadi Hadhramaut along one of Yemen's ancient eastward trade routes. The valley shelters fields, date palms, buckthorn trees and the homes of an estimated 25,000 people.



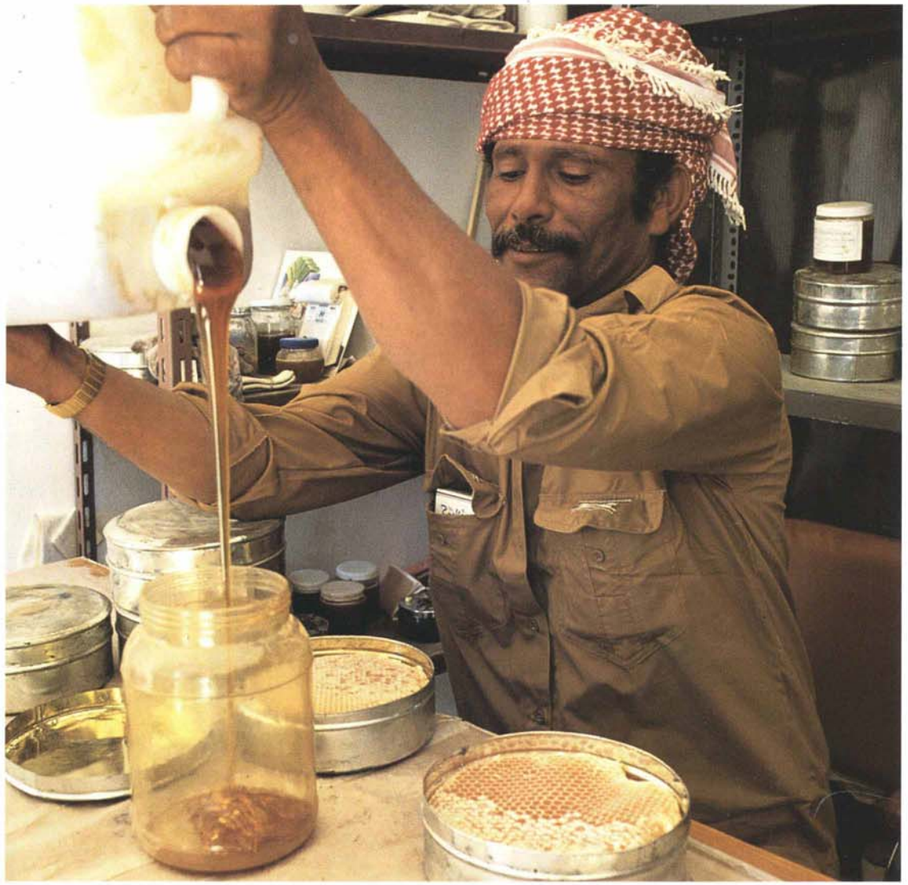
The soft comb of asal du'ani, *or honey of Du'an, is easily eaten with fingers or a spoon.*



was a complex mixture of butter, wildflowers and mysterious, aromatic herbs. *Bariyah* is eaten mostly by wealthy men.

Next, he opened a tin of *marbahey*, a summer honey also called *sa'if* ("of the summer"), after the trees' flowering season. This, I was told, is a "hot" honey, thus good for such things as getting rid of intestinal worms, but to be avoided by pregnant woman, because it can cause miscarriage. *Marbahey* is usually eaten by dipping warm bread into a mixture of the honey and clarified butter, and sprinkling the mouthful with nigella seeds.

The dry climate of Wadi Du'an keeps the moisture level of the honey low, making for a viscous, almost pasty consistency prized by connoisseurs. They say it holds the complex flavors on the tongue far longer than other honeys. The viscosity, explained dealer Said al-Sakoti, makes the honey difficult to filter, so floating bits of wax have become, over the years, a sign of authentic asal du'ani.



The third type of honey Ahmed Ba Dhib brought out is called *mardjah*, and it, he explained, is collected between the winter and summer seasons. It is produced when fewer flowers are in bloom and is thus one of the most expensive varieties. He confirmed the stories I had heard of merchants from Gulf countries flying into nearby Wadi Hadhramaut to buy honey from the wholesalers.

Before we left, Ahmed Ba Dhib had told me of a traditional Yemeni way to preserve meat in honey. "Cut up either sheep or goat meat and submerge it in honey for six months. You must be careful to use a ceramic or glass container," he cautioned. "It is a dish that rich people eat for breakfast or at weddings." He had also mentioned that tins of honey are sometimes given to a bride's family as a special wedding gift.

Standing by the oil drum in Wadi Du'an that hot afternoon, I wondered who had taught the beekeepers the cheap trick of using sugar syrup to increase the yield—and lower the quality—of the honey. Mohammed al-Osabi, who had kept bees in his father's village, told me that the cut-up rubber thongs floating in the syrup served as platforms from which the bees could drink the syrup without falling in. He assured me that reputable buyers would avoid honey from beekeepers who ran such an operation.

Not far from where we stood, a band of wild baboons emerged from a nearby date grove. Gliding across the stony ground, they paused to glare at us and then, without hesitation, swarmed up the 90-meter (300-foot) cliff and disappeared from sight. Watching them, al-

Osabi noticed a single abandoned beekeeper's tent at the foot of the cliff. Walking closer, we came upon rows of several dozen terracotta hives, set on metal frames and wrapped in burlap and cardboard to protect them from the sun.

No one else was in sight, so we approached the hives on hands and knees to take a closer look. Unperturbed, small docile-looking bees with black and gray stripes flew in and out of the hives. I wondered about honey thieves, but then al-Osabi cleared his throat and nudged me. The shimmering profile of a man material-

With layers of cardboard shading his wooden hives, Omar Sa'eed Abdullah waves a scrap of smoking burlap in front of the hive entrance. The local bees, originally Ethiopian, are docile and about two-thirds the size of a European honeybee.

ized in the heat waves. His body gradually transformed itself into a recognizable shape, and then I heard the sound of his footsteps on the hot gravel. We stood up to greet him.

"You have some interest in bees?" he asked. He introduced himself as Omar Sa'eed Abdullah, honey producer and owner of the hives. He lit a scrap of burlap sacking and waved the smoke toward the entrance of a rectangular wooden hive before opening the back of the hive to reveal a section of golden comb. The metal legs of the hives were set in tins of motor oil to keep out ants. Hornets are another enemy of the bees, and Abdullah showed us a cleverly constructed screen trap, baited with poisoned fish and swarming with confused hornets. Gesturing to the overhead sun, he invited us to his home so that we could discuss beekeeping in comfort.

We sat on the carpeted living-room floor, kept cool by the thick walls of the four-story, mud-brick building. Shuttered windows with decorative lattice screens overlooked an expanse of date groves and, farther off, small dusty plots of farmland awaiting the seasonal rains. On a flat roof a satellite dish was perched. "CNN," my host announced proudly.

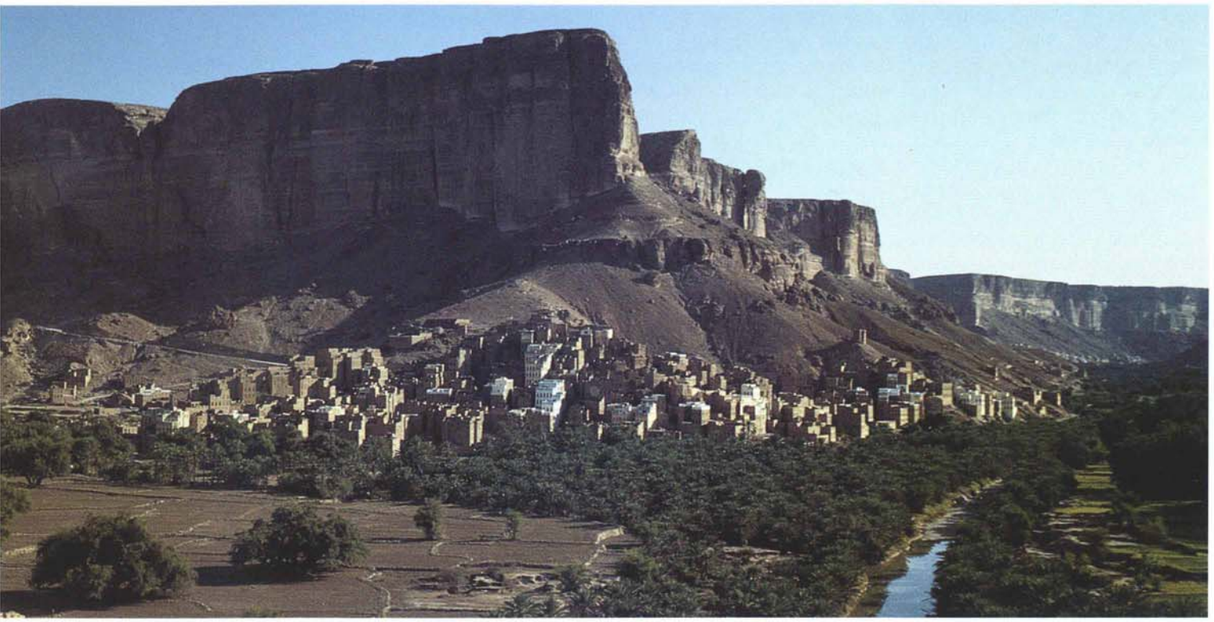
I asked him how long his family had been keeping bees.

"For generations," he said as he poured out cups of ginger coffee and offered a plate of fresh dates. "We used to keep the *jabali* [mountain] bee," he said. "I can still remember it from my childhood 30 years ago. It was reddish in color, but now it's gone. The new bee we use is from Ethiopia, from people who grow crops, but the problem is that this new bee [*Apis yemenitica*] is not as drought- and hunger-resistant as the wild mountain bee was."

When I asked him about *bariyah*, he told me that it was named after a particular star that appeared above the horizon at the time of year when this honey was produced. Honey seasons are calculated in accordance with the sidereal year, he explained, rather than the Muslim lunar calendar, because the latter doesn't keep step with the flowering cycle of melliferous plants.

Beekeepers build plywood hives or visit a craftsman who makes them of terracotta. The cylindrical shape recalls the hollowed tree trunks that were used centuries ago.

Behind a heavy wooden door that opened onto the sitting room, tins of honey were stacked waist deep. From this storeroom, Abdullah brought out a tin of buttery *kharfi* ("of the autumn"), a 100-percent-pure *ilb* honey selected from his private supply. This quality of honey is reserved for family, friends, and—as in my case—the arrival of an unexpected guest. Connoisseurs of Yemeni honey recognize a wide range of varietals within each

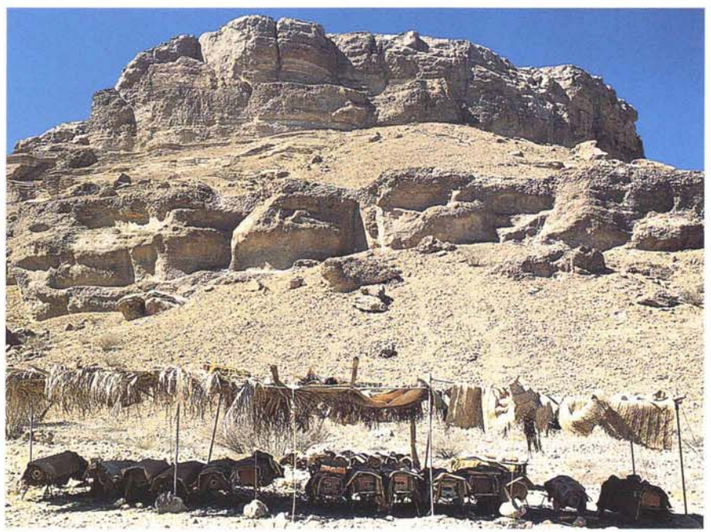


The village of Rihab is one of more than a dozen dotting the 35-kilometer (21-mile) length of Wadi Du'an.

growing region, and this tin contained a kilo of the finest honey from a special area of Wadi Du'an known as Jardan. We cut off small portions of the comb, and sat back to enjoy the sensation of thick honey melting in our mouths, revealing layer upon layer of delicate and unexpected flavors. I realized again that eating wildflower honey from Wadi Du'an is an entirely different experience from eating commercial honey—just as the finest Belgian chocolate is different from supermarket brands.

According to Abdullah, the nomadic beekeepers had recently moved their camps to the south coast in order to set their hives near the late-flowering *ilb* trees in that region. Honey profits had motorized their migrations in recent years, and they transported the hives in four-wheel-drive vehicles today; years ago they would have used camels, moving only at night in order to allow the bees to work during the day. But now as then, the mostly landless beekeepers follow their established semi-nomadic migratory pattern, and their families stay behind in often remote villages, tending the fields. Abdullah too stays put: He inherited beekeeping rights to sufficient nearby land to make it unnecessary to shift his hives with the seasons, and prefers to produce a limited amount of high-quality honey from a specific region, hoping to command a premium price that way. This strategy, he said, has brought him individual buyers from as far away as Kuwait and Bahrain.

Honey production in Wadi Du'an uses makeshift materials but time-tested techniques.



In addition to honey, the Du'an area is also famous for its bee sellers. In March, there is a market out on the main road, known as *suq al-nub*, the bee market. There, swarms of bees are sold just prior to the spring season, along with hives, the only significant piece of equipment used by the beekeepers. A plastic-grid hair curler, with foam-rubber stoppers at either end, may be used as a miniature cage to transport the queen bee, and few people use protective clothing or honey extractors. Indeed, traditional beekeepers prefer to sell honey in the comb to attest to its purity, or simply squeeze the honey from broken combs into plastic water bottles. Bits of wax and the odd dead bee float into the neck of the bottle, offering another indication that the honey was locally produced.

That night, Mohammed al-Osabi and I camped on the edge of a volcanic plateau overlooking Wadi Du'an. A full moon illuminated the villages far below. Donkeys brayed, camels roared, and the headlights of lone vehicles lurched along distant tracks until well after midnight.

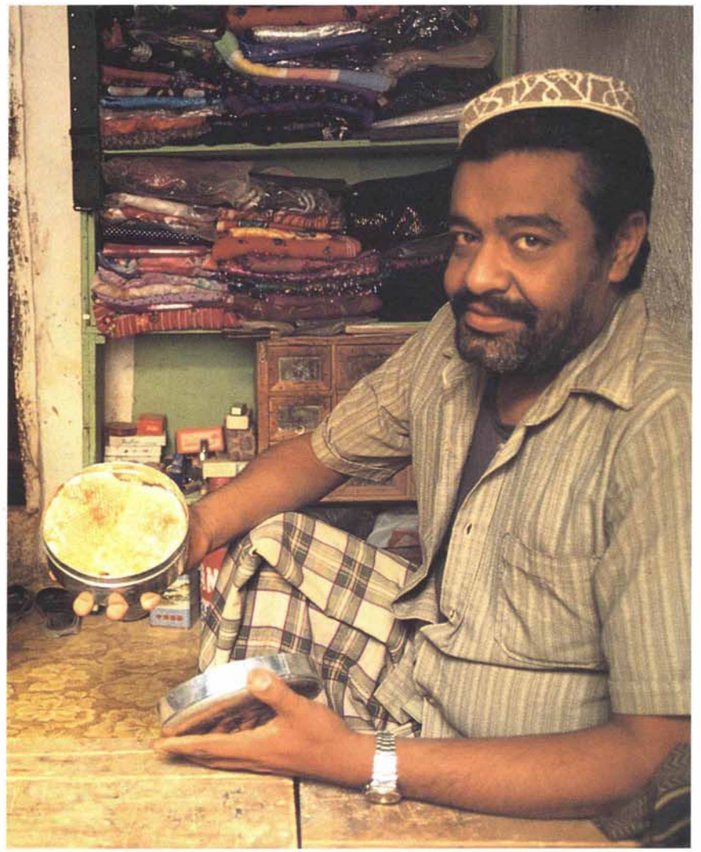
The following morning we drove north to the city of Shibam, where I met Said al-Sakoti, a dealer specializing in honey from Wadi Du'an. He explained that modern beekeeping techniques were being introduced in the area, and, looking at his shelves, it seemed that the Walter T. Kelley Company of Clarkson, Kentucky, had virtually cornered the market on beekeeping devices, ranging from wooden hives to sheet wax to bee drinking stations. Al-Sakoti admitted that the new methods of mass-producing honey, with modern, large-capacity hives set at the edge of cultivated fields, were rapidly changing traditional practices. Quantity was becoming more important than quality, he said. The bees were being fed sugar syrups and cheap imported honey to increase yields. New customers from outside the area were less discriminating than the locals, he explained, and consequently more gullible. With their time more valuable, many beekeepers now preferred to drive their hives from place to place in order to produce honey year-round, rather than just during the short seasons, as before. "But, there will always be a market for the very best honey," al-Sakoti assured us.

I asked how the old-fashioned kind of honey could possibly maintain its high price in the face of inexpensive imported brands and now mass-produced local honey as well.

"Demand and limited supply is what drives up the price," he replied. "For the people who can afford it, there is no substitute for the flavor and taste of great honey, which is the result of the gathering skills of certain beekeepers. There are many ways to adulterate honey, but an expert judges it mainly from the aroma. The taste merely confirms what the nose tells you."

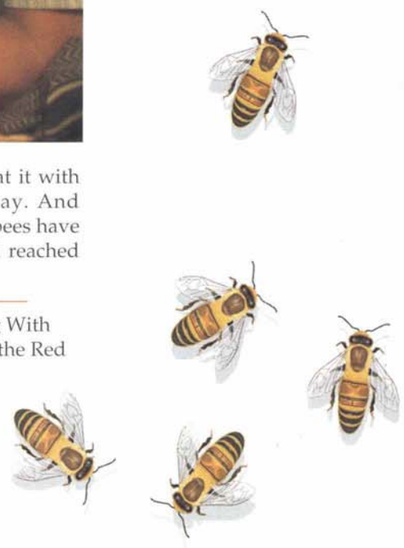
"And what is the best way to eat high-quality honey?" I asked.

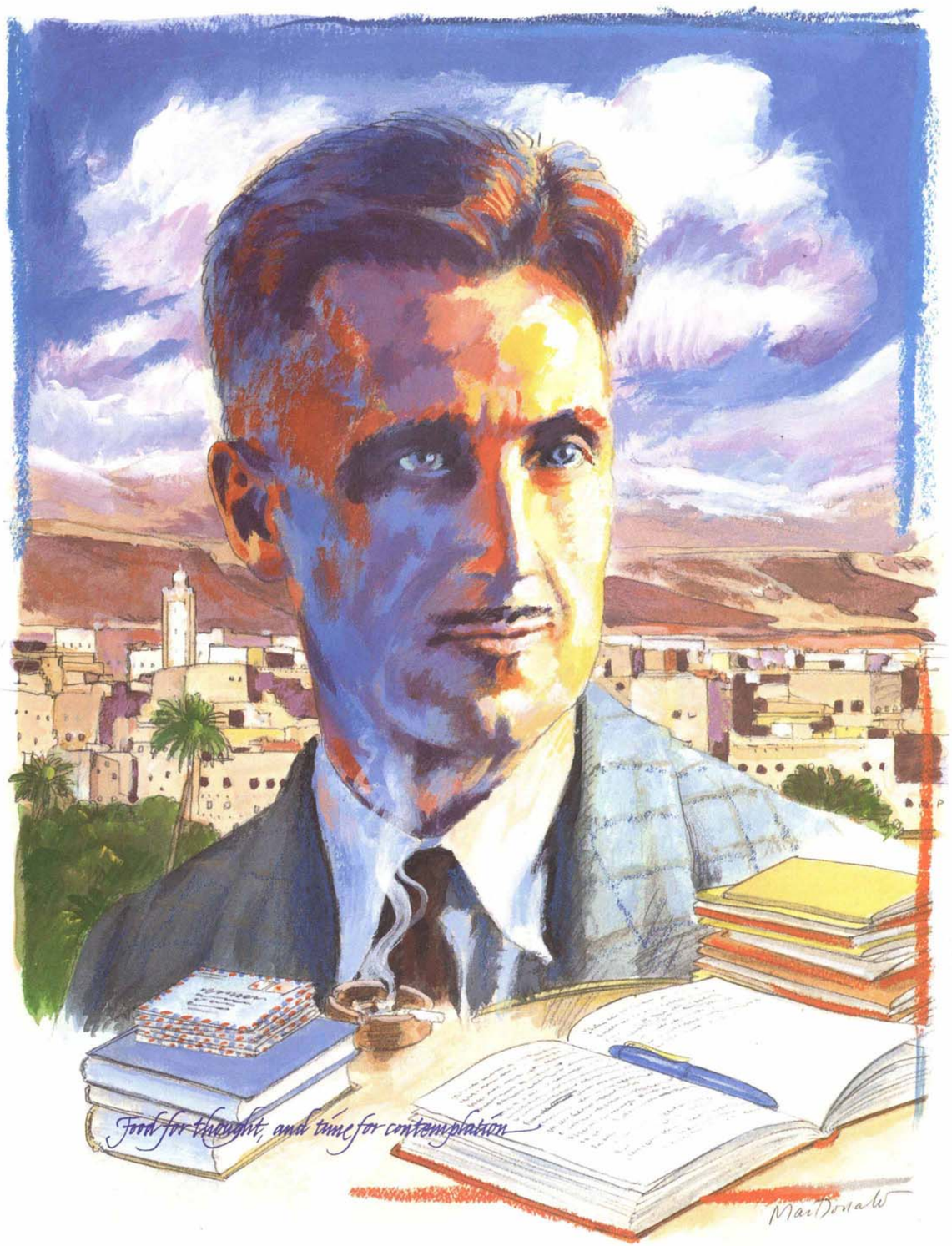
"Sometimes with a spoon, but among friends I like to cut the comb like cake and eat it with my fingers. That is the very best way. And now," he said, "shall we see what the bees have brought us this year?" He smiled and reached for a nearby tin.



Islam Ahmed Ba Dhib, whose family traces its roots in Wadi Du'an back more than a thousand years, will sell this tin of honey for not less than $100 and, depending upon the blend, possibly much more.

Eric Hansen is the author of Motoring With Mohammed: Journeys to Yemen and the Red Sea. *He lives in California.*





COMING UP FOR AIR IN MOROCCO

WRITTEN BY DANIEL PAWLEY ILLUSTRATED BY NORMAN MACDONALD

At the height of the Cold War, George Orwell, "one of England's great and necessary writers," again became a major topic of conversation. His apocalyptic novel *Nineteen Eighty-Four* and his savage satire *Animal Farm* left the impression that he might prove to be the 20th century's chief social forecaster. Might Big Brother become fact in the century's closing decades? And might Newspeak and Doublethink indeed vitiate human language and memory in an information-crazed world?

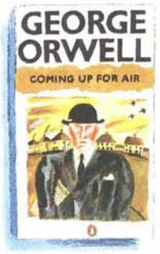
Then communism collapsed—on a global scale—and the dangers Orwell described seemed to disappear. His reputation as a social forecaster became that of a warning intellect, but his admonitions are valid today. Orwell's fear for the language remains relevant amid the din and ambiguity of political rhetoric and advertising lingo. So do his warnings about creeping totalitarianism, though on a different scale today than when *Nineteen Eighty-Four* was published nearly 50 years ago. Reading him can help us move toward a clearer understanding of the post-war and post-Cold War world.

Of course, every good writer is more than the sum of the ideas in his greatest book, and George Orwell is more than the gloomy pessimist who wrote *Nineteen Eighty-Four*.

For another picture of Orwell, we can look at him just 10 years before that book appeared, when he was basking in the pleasure of the Moroccan winter, spending six months in Marrakech, resting, observing, thinking and writing. What he accomplished there helps round out our picture of the century's compassionate social critic.

Orwell's Morocco interval is most significant because it marks his transformation from a conventional novelist distinguished by empathy with the oppressed to a powerful and astute political writer.

His best earlier books—*Down and Out in Paris and London* (1933), *Burmese Days* (1934) and *The Road to Wigan Pier* (1937)—reflect the sensibilities of a compassionate, yet objective, observer of the working-class poor. Books that followed his Moroccan stay include his brilliant portrait of the Spanish Civil War, *Homage to Catalonia* (1938), and *Coming Up For Air* (1939), a novel written while Orwell was in Morocco. Both books represent his transitional period and in many ways foreshadow the coming of his masterpieces, *Animal Farm* (1945) and *Nineteen Eighty-Four* (1948), which together have sold more than 20 million copies in 30 languages worldwide.



While in Morocco, Orwell also produced a significant essay, "Marrakech" (1939), which has frequently found its way into anthologies and even into textbooks on essay writing. In addition, he wrote several book reviews whose content reveals his maturing political views, and commentators have called *Coming Up For Air* Orwell's most fully realized novel. The Morocco interval was a fruitful one, despite the fact that it began as a sabbatical.

Orwell suffered from lung disease most of his life, and after his first diagnosed attack of tuberculosis in 1938, his physician recommended that he winter in a temperate climate. Funded anonymously by another British writer, Orwell and his wife traveled south that September, taking up residence in the Rue Edmond Doutte on the outskirts of Marrakech.

Orwell's letters from Morocco yield poignant observations of Marrakech which, like his early books, pay

The pleasures of Morocco's winter

special attention to the plight of the working class. Repeatedly he stressed that he wished to make contact with the local people, but that his situation as a tourist kept him from working alongside them and identifying with them. He wrote on his arrival: "One thing I have always believed...is that one really learns nothing from a foreign country unless one works in it, or does something that really involves one with the inhabitants. This trip is something quite new to me, because for the first time I am in the position of a tourist. The result is that it is quite impossible...to make any contact with the Arabs, whereas [under other circumstances] I should immediately have the entree to all kinds of interesting society, in spite of the language difficulty."

He knew, from his days as a struggling writer on the bum in Europe, that to know people involves working with them, sharing their struggles. This was a central theme in *Down and Out in Paris and London*, where Orwell's narrator finds himself on society's bottom rung, struggling to survive as common laborer. It is also a theme in other early work.

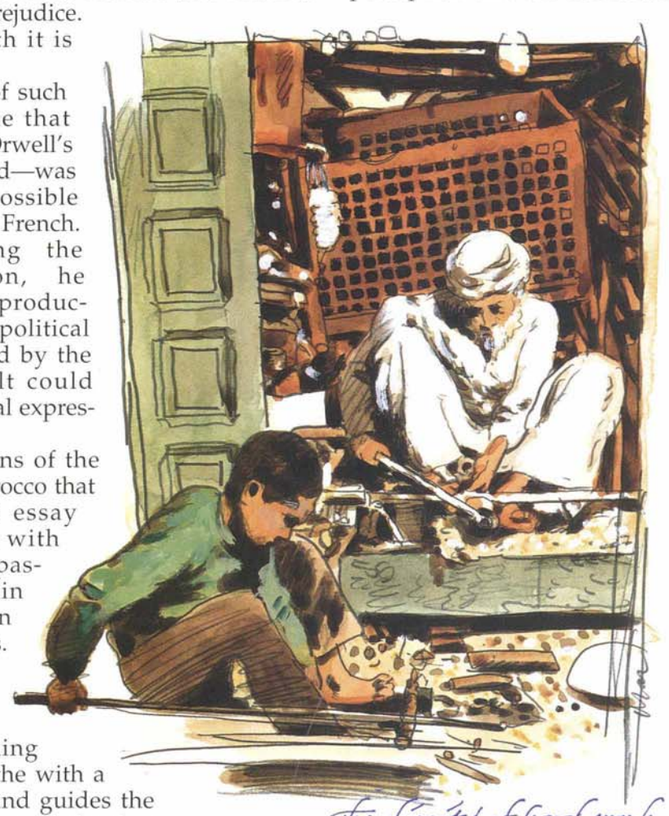
"I am as usual taking careful notes of everything I see," he wrote in Marrakech, "but am not certain what use I shall be able to make of them afterwards." But his notes, limited though he felt they were, offer revealing glimpses of Marrakech between World Wars I and II.

The poverty, for instance, seemed worse than what he had observed in Burma. And, as it did in other Western writers with social concerns, the poverty roused in Orwell scorn for the ruling power. As E.M. Forster had condemned the British presence in Egypt years earlier (See *Aramco World*, January-February 1988), Orwell attacked France's hold on Morocco with intensity.

He wrote in November 1938, "The French are evidently squeezing the country pretty ruthlessly. They absorb most of the fertile land as well as the minerals, and the taxes seem fairly heavy considering the poverty of the people. On the surface their administration looks better than ours and certainly rouses less animosity in the subject race, because [the French] have very little colour-prejudice. But I think underneath it is much the same."

An intriguing result of such observations—and one that could come only from Orwell's politically sensitive mind—was his perspective on a possible Arab revolt against the French. Any uprising among the Moroccan population, he believed, would be unproductive: Since any hint of political activity was suppressed by the ruling power, a revolt could amount only to a national expression of defiance.

It was his observations of the colonial situation in Morocco that gave rise to Orwell's essay "Marrakech." Written with clarity and controlled passion, "Marrakech" again shows Orwell's attention to the dignity of workers. "A carpenter sits cross-legged at a prehistoric lathe," he writes, "turning chair-legs at lightning speed. He works the lathe with a bow in his right hand and guides the chisel with his left foot, and thanks to a lifetime of sitting in this position his left leg is warped out of shape. At his side his grandson, aged six, is already starting on the simpler parts of the job."



The dignity of hard work

Beyond the dignity, however, Orwell also shows us despair. Workers struggle to grind out an income, producing goods only the wealthy will enjoy, while the poor themselves remain invisible. "All people who work with their hands are partly invisible," Orwell writes, "and the more important the work they do, the less visible they are." This theme pervades Orwell's early work.

And in Morocco, the invisibility of the poor to their colonial masters is compounded by the fact that the people have brown skin. Here Orwell sounds an impressive theme: that Western imperial powers exist and rule because of the presence of the poor, dark-skinned, working class. Orwell: "When you walk through a town like this...,when you see how the people live, and still more easily how they die, it is always difficult to believe that you are walking among human beings. All colonial empires are in reality founded upon that fact."

We oppress because we do not see, Orwell believed, and we do not see because skins are dark and people are poor. Thus, the imperial power's activities are based on the most insidious prejudice, and on the perception that the colonized people "are... merely a kind of undifferentiated brown stuff, about as individual as bees or coral [polyps]."

With this in mind, Orwell wanders about Marrakech observing locals who have been recruited by the French for infantry duties. A young Senegalese marches in step with a thousand other non-French soldiers, crammed into shoes that are too small, wearing a helmet that is too large, his individuality sacrificed to his French military uniform and the metaphorical uniform that is his non-French dark skin.

"How much longer can we go on kidding these people?" Orwell writes. "How long before they turn their guns in the other direction?"

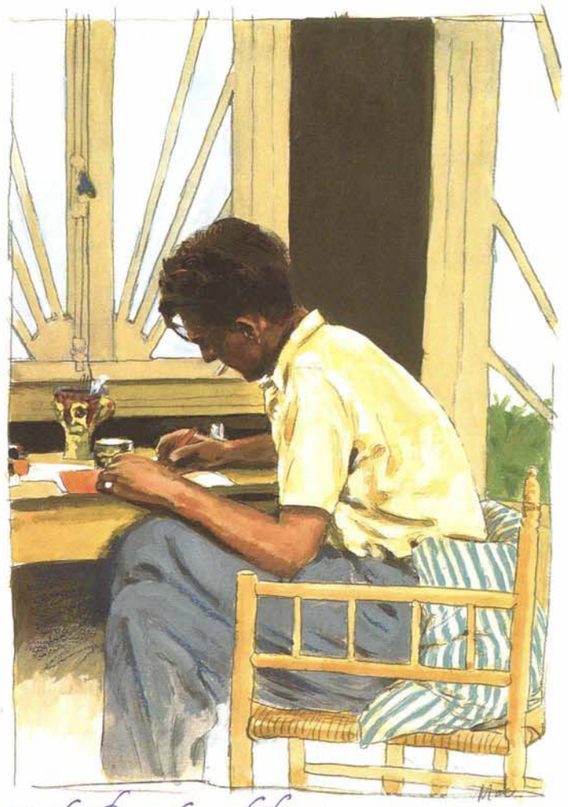
The fact that Orwell asked such questions in "Marrakech" ties the essay to his earlier work on oppression and poverty. But "Marrakech" also foreshadowed future work. We have faint glimpses of his classic animal allegory, for instance.

Animal Farm was still six years in the future, yet in "Marrakech" Orwell displays his close attention to the personalities of animals, and their significance in illustrating social issues. While feeding bread to a gazelle in the public gardens of Marrakech, Orwell described how the animal took the bread but butted away the giver. Another time, he offered a description of a donkey that paralleled his view of the human sit-

uation. "It follows its master like a dog," he narrates, "and does not need either bridle or halter. After a dozen years of devoted work it suddenly drops dead, whereupon its master tips it into the ditch...."

Clearly, Orwell's routine observations of animals were being stored up for the indictment of Soviet communism that he was to write in *Animal Farm*. As early as 1937, on his return from the Spanish Civil War, he had equated the relationship between man and beast with that between the wealthy and the workers.

He had written, "I saw [in Spain] a little boy, perhaps 10 years old, driving a huge cart-horse along a narrow path, whipping it whenever it tried to turn. It struck me that if only such animals became aware of their strength we should have no power over them...."



In the Rue Edmond Doutte

While "Marrakech" connects Orwell's early and later work, most of his other Moroccan writing fits better into the later category. In his essay "Why I Write," he had pointed out that his involvement in the Spanish war had radically changed his outlook. Orwell's book commentaries and his novel *Coming Up For Air*, written in Morocco, strongly reflect this political reorientation. In his review of Bertrand Russell's *Power: A New Social Analysis*, for instance, he attributes the rise of Hitler, Mussolini, Franco and Stalin to "bully worship," and argues that "under various disguises, [it] has become a...religion."

Orwell expressed his fear of totalitarianism, before writing *Nineteen Eighty-Four*, in the pages of *Coming Up For Air*. Bertrand Russell, repaying Orwell's review of *Power*, reviewed the novel himself. He wrote: "Depicts with very great power the horrors of a well-established totalitarian regime of whatever type. It is important that the western world should be aware of these dangers, and not only in the somewhat narrow fear of Russia." Wittingly or unwittingly, one of the century's most prominent intellectuals and one of its most insightful novelists had come to the same conclusions about the political horrors of the time.

To appreciate *Coming Up For Air*, it is helpful to note Orwell's mind-set while he was living in Morocco. His letters, written in Marrakech between September 26, 1938, and March 5, 1939, reflect a common anxiety about the threats of war and fascism. Fresh from the Spanish Civil War, where he had taken a bullet in the throat, Orwell's already gloomy nature was further darkened by an impending second world war.

To Jack Common, his friend and fellow writer, Orwell complained: "I don't know whether or not you will be fitting on your gas mask by the time this gets to you, but things look pretty bad and are perhaps even worse than I think.... If war does break out it is utterly impossible to foresee what will happen.... The whole thing seems to me so utterly meaningless that I think I shall just concentrate on remaining alive."

If war does break out, then what? The question obsessed Orwell as he wrote his essay and book reviews, and as he created *Coming Up For Air*. If war comes and totalitarianism wins Europe, what will life be like under a Hitler or a Stalin? Like *Nineteen Eighty-Four*, *Coming Up For Air* explores this question.

The novel tells the story of George Bowling, a middle-aged English insurance salesman who revisits Lower Binfield, the setting of his boyhood. In a familiar innocence-lost portrait—like Thomas Wolfe's *You Can't Go Home Again*, also published in 1939—Bowling discovers that his hometown has changed beyond recognition. "Where was the town I used to know?" Bowling asks. "It might have been anywhere. All I knew was that it was buried somewhere in the middle of that sea of bricks."

Regretting the loss of his beginnings, Bowling finds his experience intensified by threats of war. Bombers fly overhead and the reader senses that the entire country will one day soon be blown to bits. One recalls Orwell's fear of war while in Marrakech. Then, toward the end of the novel, we discover an intense passage that sounds like a preface to *Nineteen Eighty-Four*. The fear of war, as revealed by Bowling's consciousness, comes first:

> War! I started thinking about it again. It's coming soon, that's certain. But who's afraid of war? That's to say, who's afraid of the bombs and the machine guns? "You are," you say. Yes I am, and so's anybody who's ever seen them.

And then as the narrator's voice flattens out, we seem to hear Orwell's own voice and its familiar tone, warning of the world to come:

> But it isn't the war that matters, it's the after-war. The world we're going down into, the kind of hate-world, slogan-world. The coloured shirts, the barbed wire, the rubber truncheons.... And the processions and the posters with enormous faces, and the crowds of a million people all cheering for the leader.... It's all going to happen.

That passage, written in Morocco, is as dark as anything Orwell ever put on paper. And it shows where his imagination was headed: away from the streets of poverty, past the wars, away from the surface oppression of earlier works, and all the way to the dark world of *Nineteen Eighty-Four*. It is perhaps owing in some small way to Orwell's prophetic vision that that world has not come fully true.

Involvement in the Spanish war had changed his outlook

Would *Coming Up For Air* have been written had Orwell never wintered in Morocco? Possibly. But midway through his time there, he wrote: "I am spending the winter here for the sake of my lungs, which I think it is doing a little good to. Owing to this blasted health business I have had what is practically a wasted year, but the long rest has done me good and I am getting on with a new novel, whereas a year ago after that awful nightmare in Spain, I had seriously thought I would never be able to write a novel again."

His best work still lay ahead, however, as Morocco, in its unique way, contributed to the development of Orwell's genius and achievement.

Daniel Pawley, on sabbatical from his professorship at Northwestern College in St. Paul, Minnesota, has written earlier Aramco World *articles on connections between English-language literature and Middle Eastern history.*

BILL LYONS

THE GARDENS OF MARIE BALIAN

WRITTEN BY
JANE M. FRIEDMAN

SHE IS A SMALL LADY WITH WAVY COPPER hair, a grandmother. She wears prim suits with pearls, and says she doesn't make a move without her husband's consent. When she greets you, she delicately shakes your hand and kisses you on both cheeks, French-style. She is one of the pre-eminent artists of the Middle East.

Marie Balian, 68, an Armenian whose family originally hails from a small town in western Turkey, came to world attention in 1992 when the Smithsonian Institution, the national museum of the United States, paid tribute to her work with a six-month show.

Before that and since, day after day, in a sun-flooded studio not far from Jerusalem's al-Aqsa Mosque, Marie Balian puts on an oversized men's shirt and sketches new visions of gazelles and peacocks, or a new configuration of trees and flowers, on white paper.

Although tourists wander in and out of the showroom attached to her studio, few are aware that here, in an adjacent room, an artist is quietly working.

But "Views of Paradise," as her Smithsonian exhibition was titled, provided evidence enough. It included more than 20 wall-size panels that, together, presented an artist's conception of the ultimate garden. The show occupied the largest space the Smithsonian has ever devoted to contemporary Middle Eastern art.

"Views of Paradise" was also unusual in that the art was not on canvas, wood, hardboard or metal. Marie Balian continues a centuries-old Middle Eastern tradition of painting garden scenes on ceramic tiles. Typically, such scenes, intricate and quite formal, covered the interior or exterior walls of mosques, churches or palaces.

Although not Muslim, Marie Balian is continuing an Islamic style said to have originated in Persia. It flourished in Turkey in the 18th century, and was brought to Jerusalem in this century by three Armenian families who have passed the techniques from parent to child.

Although tile painting existed for centuries as a craft, Marie Balian stands alone in modern times as having elevated it to the status of fine art, experts say.

"Marie Balian continues an art of ancient times," says Ora Van Beek, an ethnologist who discovered the artist and her glazed tile panels in East Jerusalem more than 25 years ago. "I believe that Marie Balian is here to remind us of the glorious beauty of nature."

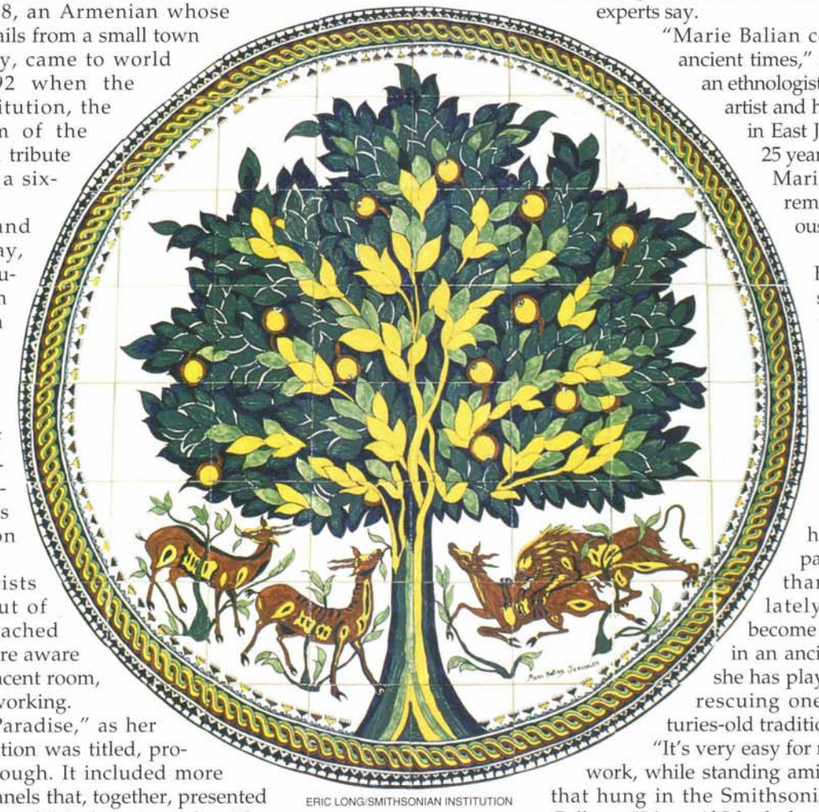
"I regard Marie Balian as an artist," says Gus Van Beek, the ethnologist's archeologist husband and curator of the Smithsonian show. "We have never seen a tile painter equal to her."

Although Balian has been applying paint to clay for more than 25 years, only lately has she herself become aware she is a link in an ancient chain, and that she has played a crucial role in rescuing one branch of a centuries-old tradition from oblivion.

"It's very easy for me," she said of her work, while standing amidst the wall panels that hung in the Smithsonian's International Gallery. "It's as if I had already done this in an earlier age, like the fourth, fifth or sixth century."

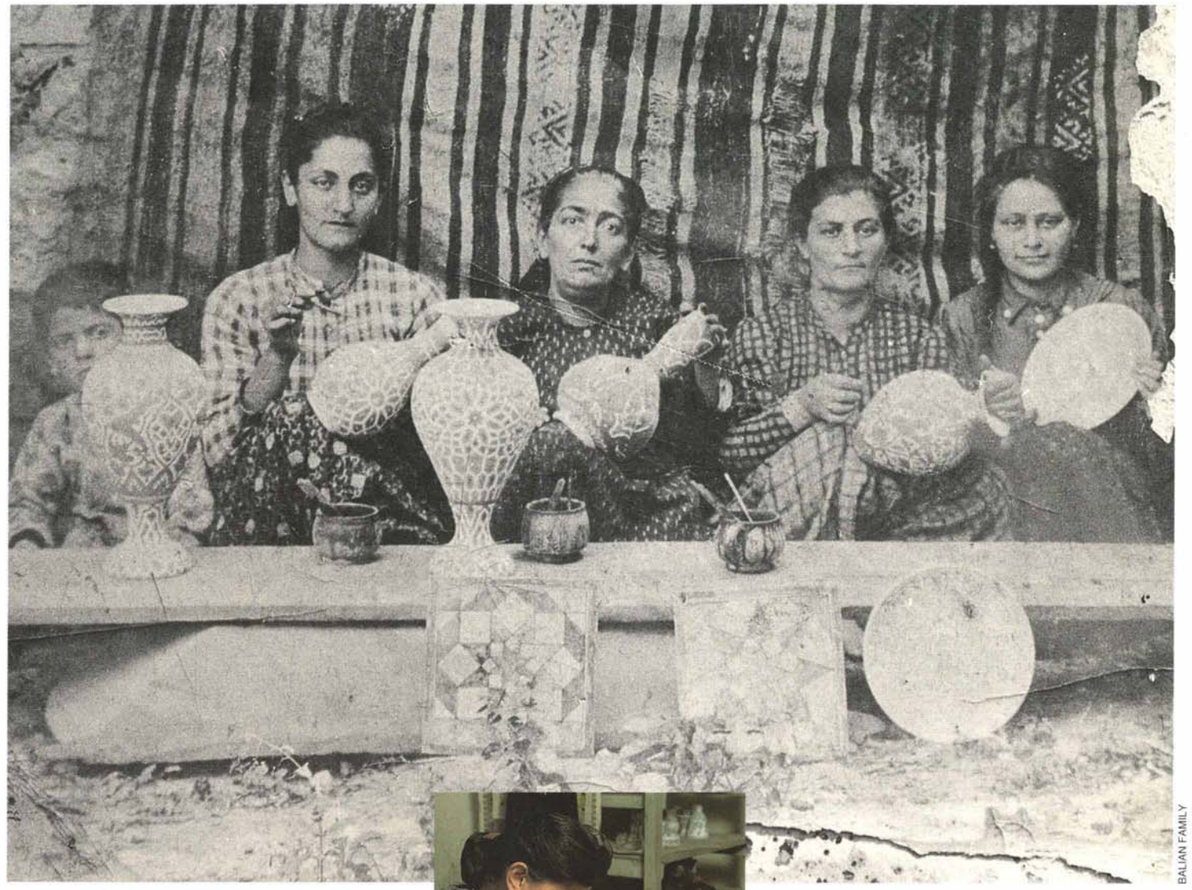
The Middle Eastern technique of painting on ceramics actually developed in the third millennium before Christ. According to Gus Van Beek, who did the research for the show, painted ceramic elements first appeared in ancient Mesopotamia, where they adorned the exteriors of buildings.

By the 13th century after Christ, says Van Beek, Persian artists were favoring garden scenes for their painted ceramic tiles, and this style spread—thanks in part to the invading



ERIC LONG/SMITHSONIAN INSTITUTION

Drawing on tradition that began in 15th-century Persia, Marie Balian (opposite) sketches a wall-sized panel of tiles in her East Jerusalem studio. She based "The Tree of Life" (above) on an eighth-century mosaic in the Jericho palace of Umayyad caliph Hisham.



BALIAN FAMILY

BILL LYONS

In Kutahya, Turkey, the grandmother of Setrak Balian, Mary Barchabanian (at left in photo at top) directed pottery painters in this 1916 photograph; today (above), Palestinian artisans help the Balian family business.

Mongols—throughout the northern tier of the Islamic world, from Persia to Turkey, then southwest through the Maghrib and into al-Andalus, in southern Spain, where some of the most mesmerizing tile painting is still being done today (See *Aramco World*, March-April 1992).

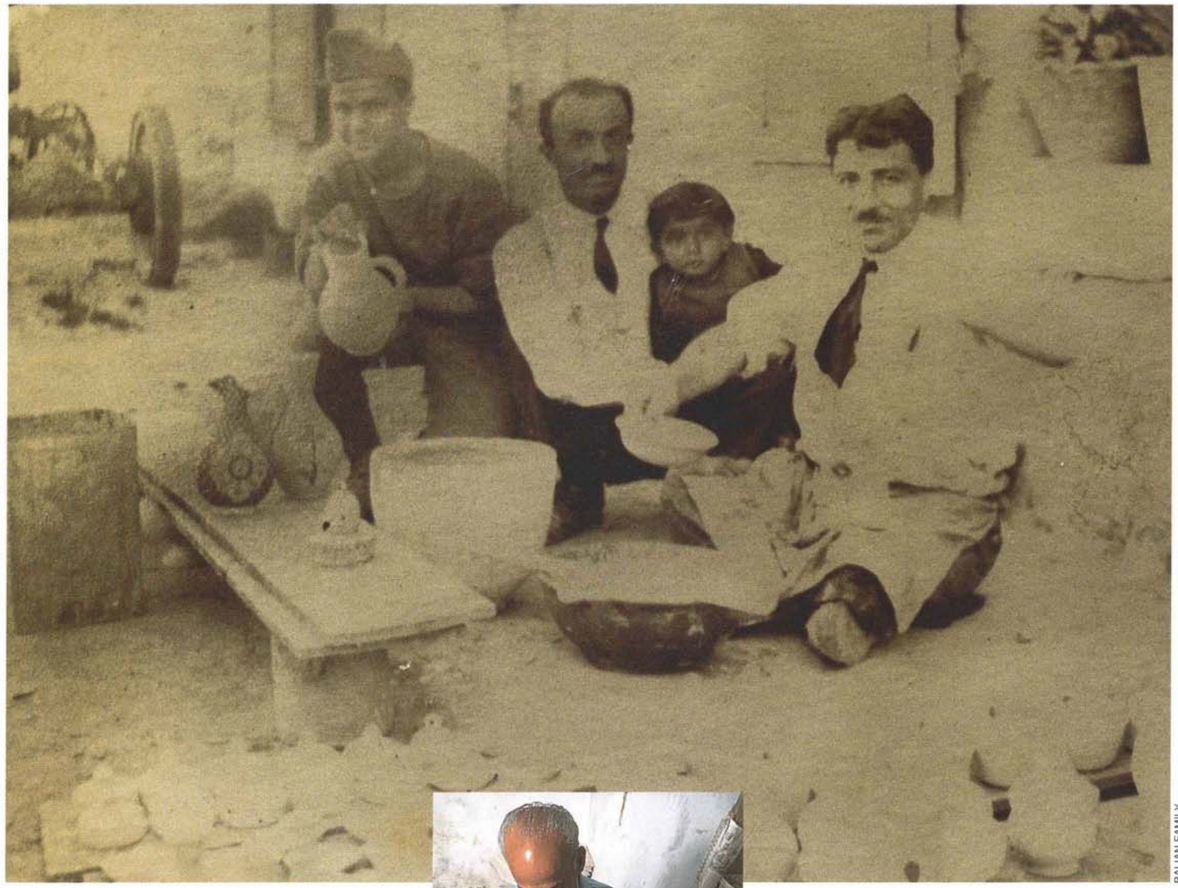
Experts say this style of decorative art—on tiles as well as in carpets and manuscript illumination—developed partly because of Islam's ban on depicting animals or humans. Most artists in the Muslim world thus eschewed media such as oil painting and sculpture, opting instead for abstract decorative motifs, often elaborate geometric or floral arabesques. However, in some parts of the Islamic lands, says Van Beek, observance of the ban on depicting animals somehow lapsed, and the arts began to include, now and then, birds and animals.

"The style evolved," speculates Ora Van Beek, "because much of the Middle East is very dry. So people might be willing to spend a lot on a garden, with flora and fauna all around"—and, one can safely speculate, on gardens of the imagination as well.

In the 1400's, Armenian artisans in a small Turkish town named Kutahya developed a distinctive "Islamic" style in decorative ceramics. A century later, they were competing with rivals in nearby Iznik as purveyors of exquisite ceramics to the Ottoman court.

By the 18th century, the Kutahya craftsmen had largely displaced Iznik and developed their style into one characterized by airy, unpretentious designs of small medallions, dainty flowers and geometric forms in yellow, green, turquoise, black, red and cobalt blue on a translucent white background. With exports to England and France, their renown grew. In 1917, when the newly installed British authorities in Palestine invited three Armenian families to come and repair the 16th-century tiles in Jerusalem's Dome of the Rock, they accepted.

British interest in the Dome of the Rock had been enhanced by the discovery on the 3000-year-old site of an ancient pottery kiln. Armenian potter David Ohannessian first examined the kiln and determined that, with restoration, it could still be used. He called upon two more families to assist him in the project.

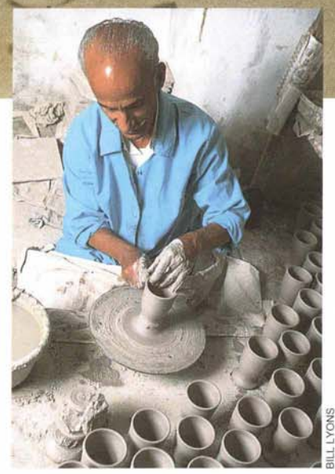


BALIAN FAMILY

But when the Balian family joined the Ohannessian and Karakashian families in Jerusalem's Old City, they suddenly found themselves out of work. The British Pro-Jerusalem Society had failed to raise sufficient funds to renovate the kiln. Nonetheless, returning to Turkey was no longer possible. The families decided to stay put. They banded together to produce locally what they knew best: ceramics painted gracefully in deep blues, aquas, rich greens and yellows in a markedly Islamic style. Operating out of a workshop on the Old City's Via Dolorosa, they painted tiles both large and small for the walls of the city's buildings.

In 1922, the Balians and Karakashians split from the Ohannessian family and established a workshop of their own just north of the Old City walls on Nablus Road. There, Megerditch Karakashian, the painter, was responsible for decoration, while Neshan Balian, the potter, shaped vessels on his wheel and fired the tiles. The business flourished, producing bowls and vases decorated with fawns, peacocks and swirling garlands.

But the partnership did not survive the ascendance of a new generation. In 1966, the Balians and Karakashians split. Responsibility for the Balian atelier passed to Neshan Balian's son Setrak. But although the Karakashians had a master painter in the family, the Balians, long experts in pottery, did not.



BILL LYONS

In 1924, Setrak Balian was photographed as a young child next to his father, Neshan Balian (at right in photo at top), in the atelier where today (above) Setrak himself throws, fires and glazes daily.

Enter Marie Balian, then aged 39. Her branch of the Balian family had fled Turkey on foot to Greece in 1917. From there, they took ship for France, and Marie was born and grew up in Lyons.

"I started drawing when I was six years old," she recalled. "At 10, I was doing portraits." Later, her mother sent her to the Académie des Beaux-Arts.

In 1953, she met her distant cousin Setrak on his way to study ceramic engineering in England. They fell in love, and the following year they married in Bethlehem.

Twelve years later, Marie Balian was allowed finally to assume the mantle of master painter at the Balian atelier. The business was now called Palestinian Pottery and, at last, it came into its own.

"When I started," she recounts, "the style was

a bit boring. I tried not to copy the Kutahya style but to renew it."

Seeking new sources of inspiration, Balian traveled to Jericho, where she saw the eighth-century mosaic floor in the excavated Hisham Palace. Here, in the winter residence of the Umayyad caliph Hisham, she studied a vivid rendition of the tree of life, showing two gazelles grazing on one side of the tree and a lion savaging a gazelle on the other. She took that theme home, put brush to tile, and gave it a fresh look.

Then she added movement to what had traditionally been static compositions. Suddenly, gazelles were prancing, peacocks were preening, garlands were flowing. And symmetry gave way to dynamic asymmetry.

Customers came from further and further away. Diplomats, journalists and travelers heard about Palestinian Pottery and flooded it with orders. In 1969, while on a dig near Gaza, the Van Beeks came to Jerusalem and to Palestinian Pottery.

Thus began a long relationship in which Ora Van Beek became a muse to Balian, encouraging her to sign her work and to experiment more and more.

"On one visit to the atelier," says Gus Van Beek, "I heard Ora scream. She was standing in the Balian museum, where they have some of the family treasures, looking at a tile panel with tears in her eyes. Ora said to Marie, '*This* is your art form. Why not do more of this?'"

As Marie Balian began to paint tile murals, "her creativity blossomed," says Van Beek, "and then we thought, 'Wouldn't it be great if we could have an exhibit in the Smithsonian?'"

Two years later, the exhibit opened in the Smithsonian's Ripley Center. The effect of the panels was of an idyllic Levantine paradise glimpsed through a window, or perhaps through an archway. It was so well-received that the gallery extended its stay.

Marie Balian does not speak easily of herself or her achievements, but the exhibition prompted her to look back at her life as a painter. Sitting on a bench near a gurgling fountain, she pondered her legacy.

"My contribution to Middle Eastern art," she says, "is all the designs. They are all original except for the Hisham Palace. I tried to bring more Armenian art to these panels—by adding trees and birds—to renovate this art, to bring my own cachet."

"I'm so happy when I start something new that I forget where I am," she explained. "My inspiration comes only from seeing nature. For example, a bird. You can put your soul on it and fly someplace else in peace."

Balian's style, experts say, fuses the Armenian tradition with its animals and birds with the purer Islamic style of arabesques.

"Marie is painting ancient art in modern times," said Ora Van Beek. "She had the good fortune of living in a family environment that nurtured her talent. And she's been living shoulder to shoulder with Palestinian women who embroider a whole world of flora and fauna on their dresses." (See *Aramco World*, January-February 1991)

"But she has advanced this art form because she's a modern woman. The animals in her pictures have human characteristics."

Neshan, Marie's 36-year-old son, represents the third generation of Balian potters, and says he feels compelled to continue the family tradition. He has studied ceramic engineering, and has been working in the suburbs of Washington, D.C., designing Balian painted tiles for custom-made kitchens and baths. Still, he feels the pull of the Middle East.

"The unique thing that my mother has is the primitive style when painting on tiles. It's her niche, with no competition. She still has a lot of geometric and symmetrical Arab influence, but the asymmetric floral movement is all my mother's. Here, I experiment a lot with new methods and materials," he says, "but in Jerusalem, I sit at the same wheel where my grandfather sat. You can't ignore that."

Of the original three Armenian families from Kutahya, only the Balians continue the craft in its original form. The Karakashians, on the Via Dolorosa since the 1960's, still hand-paint their wares but buy the vessels ready-made. In Hebron, a profusion of factories now scrap over what has become a lucrative pottery market, copying the Islamic-Turkish-Armenian motifs with assembly-line precision and selling the wares in the tourist shops of Amman and Jerusalem.

At Palestinian Pottery, Setrak Balian, now in his 70's, shapes the vessels on his wheel and fires them in the family kiln, day after day. Gradually he is ceding the wheel to his son Neshan who returned recently from the US. Marie, when she is not working on a tile design, outlines the decoration on the pots. Colors are painted in by younger Palestinian craftspeople the Balians have trained. The pots are then dipped in glaze and fired a second time, the way it has been done for centuries.

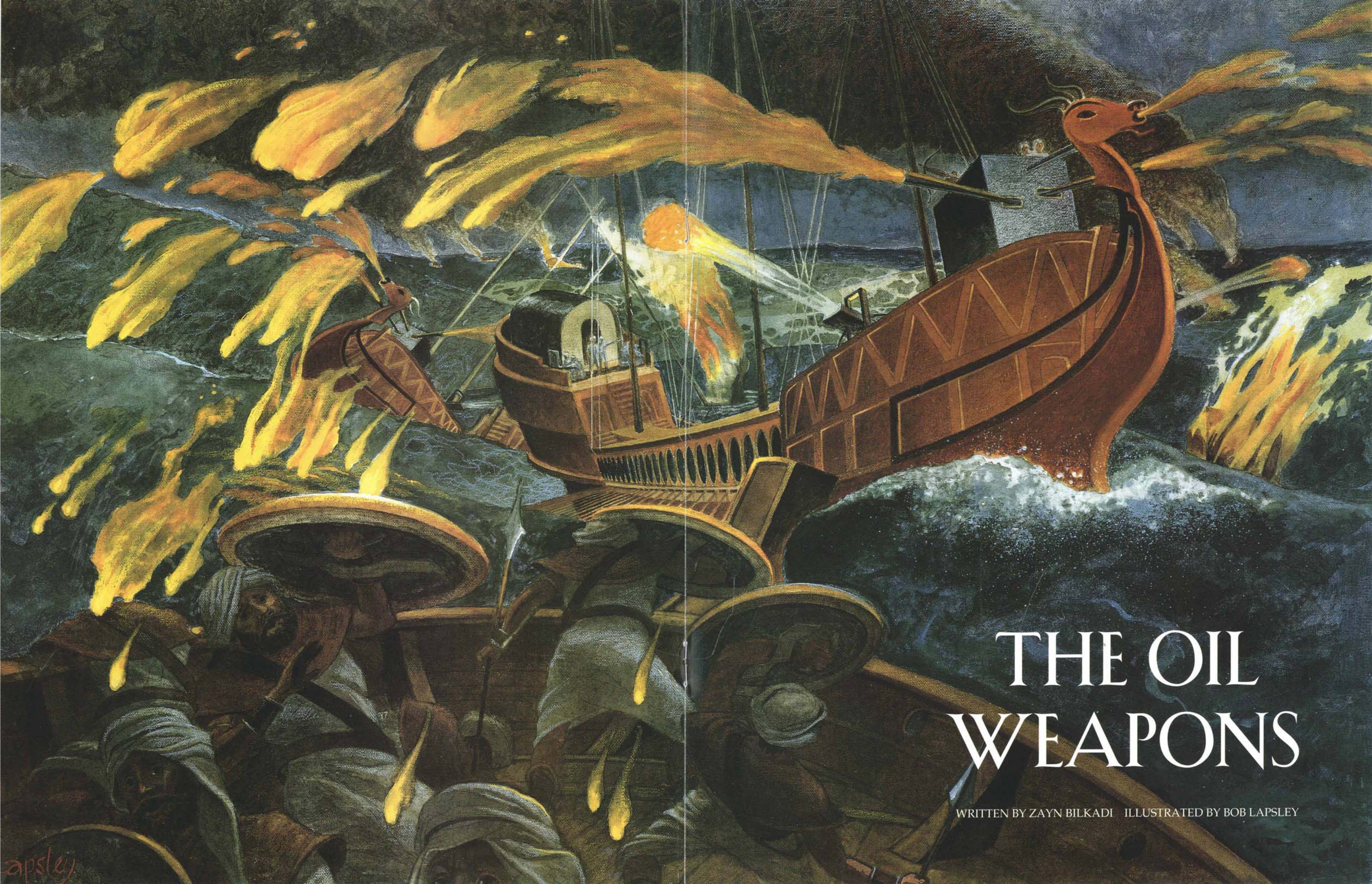
Will the tradition that started nearly 4000 years ago in Mesopotamia, took root in 15th-century Turkey and thrived 500 years later in Jerusalem find a bridge into the next century? Marie Balian is optimistic.

"It will survive," she says. "It survived until now. The world renews itself. One artist dies and another one comes."

Washington freelancer Jane M. Friedman was a foreign correspondent in the Middle East for CNN and The Christian Science Monitor.

Balian tile gardens can be found throughout Jerusalem.

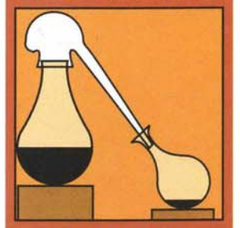
PHOTO GARO (5)



THE OIL WEAPONS

WRITTEN BY ZAYN BILKADI ILLUSTRATED BY BOB LAPSLEY

ANCIENT OIL INDUSTRIES



PART 2

THE MEDIEVAL MUSLIM OIL AGE OPENED WITH A TALE OF TREASON.

Sometime in the early years of the 15th century, an old man of Persian descent came to Makkah to perform the Hajj, the pilgrimage. His name was Abu Tahir al-Fayruzabadi, and he was one of the foremost scholars of his time. After spending most of his life traveling in the Mongol-devastated lands of the Middle East, soaking up what knowledge he could find in the remaining schools of Baghdad, Damascus and Jerusalem, Abu Tahir had only one ambition left: to write a lexicon of the Arabic language that would have no equal.

Makkah, the old man found, was just the place he had been longing for. Away from the turmoil and misery of his time, it offered him the tranquility he needed to fulfill his dream. Seven years later, he finished his monumental work, more of a condensed encyclopedia than a lexicon, titled *Al-Qamus al-Muhit*, or *The All-Encompassing Dictionary*. To this day, it remains one of the best references ever written on the Arabic language and Arab culture.

Al-Qamus, it turns out, contains a remarkable section that deals with oil. Not only does Abu Tahir dwell on the origin and nuances of the word *naft*—then the Arabic word for natural naphtha, today meaning "petroleum"—but he elaborates: "The best grade of naphtha is the water-white. It is a good solvent, a diluent and an expectorant. Taken internally, it relieves cramps and aches of the belly, and, when applied topically, it can sooth skin rashes and infections.... The word *naffatah* has three meanings," he continues, "a naphtha well or fountain, a naphtha lamp used for lighting, or the brass instrument used to throw naphtha."

What Abu Tahir is telling us is not only that oil was known to his Muslim contemporaries, but that it was commonly sold as a medicine and as a fuel for lighting, and that it was used as an incendiary in what must have been a type of military flame-thrower. In fact, we can legitimately infer from this passage all the elements of a thriving oil industry, in the modern sense of the term, if on a medieval scale and powered by fire and by human and animal muscle rather than machines. Laborers evidently worked the oil wells, or *naffatah*, to obtain the oil; cameleers and merchants transported and sold it in the cities as lighting fuel; craftsmen built lamps to burn the oil and weapons of brass or bronze to use in war; and pharmacists made an assortment of remedies from it.

But the most intriguing word of Abu Tahir's passage is his statement that "water-white" naphtha was the best kind, implying that there was another grade of inferior quality. Could "water-white naphtha" be the 15th-century Arabic term for kerosene or another light petroleum fraction, as opposed to the darker crude oil? If so, then the Muslims of that era must have practiced some form of crude-oil refining, and there must have been refiners and other associated technicians in this line of work.

Fortunately, we don't have to rely on guesswork to reconstitute the story of oil in medieval Islam. Many other Arab scholars before Abu Tahir had written in more detail on the subject, including physicians, historians, travelers, philosophers, military experts, alchemists and even poets. What might be called the Early Muslim Oil Age began more than 700 years before Abu Tahir's book, and it opened with a tale of defection and treason worthy of the best modern spy thrillers.

Sometime between the years 670 and 680, wrote the Byzantine historian Theophanes, roughly 40 years after Muslim armies added Syria to the growing Islamic state, a discontented Umayyad subject from Damascus sought refuge in Byzantium. Hardly anything is known about the identity of this man except what Theophanes wrote about the secret he gave the Byzantines, which may partly explain why his Byzantine name, Kallinikos, means "handsome winner." Kallinikos likely had served with the Muslim military, perhaps as a naval recruit in the service of the young Umayyad navy stationed in Antioch—now Antakya—in Turkey.

Kallinikos brought with him information that the Byzantine navy, then besieged by the Muslims, welcomed very warmly. He was, as we would say today, a petroleum consultant, and he taught the Byzantines no less than a secret formula for a petroleum mixture that would burn even in water. All the Byzantines had to do was to build on the bow of one of their ships a large siphon to squirt the liquid. The Emperor Constantine IV, Theophanes wrote, saw this as a chance to eliminate the Muslim threat to Constantinople. He ordered his high command to work with the defector in strictest secrecy.

In the seventh year of the siege, in 680, the fire of Kallinikos, later erroneously called "Greek fire," was used in naval combat in what became known as the Battle of Kyzikos. For the Muslim navy, the consequences were disastrous, Theophanes wrote. The entire flotilla, manned mostly by Syrians and Egyptians, was burned at sea. Theophanes put the losses at 30,000 men, although his figures are likely much overstated. In any case, the siege was broken, and the Muslims signed a 30-year truce. Thus, if we are to believe Theophanes—and there is little reason to doubt at least the general outline of his account—the oil weapon must have been an awesome invention, for the Muslim navy that suffered its lethal effects had only a few years before destroyed 500 Byzantine ships in a single battle.

There is no mention of oil, fire or Kallinikos in any surviving Muslim account of the battle. That Kallinikos fled Syria makes it more than likely that the secrets he took with him were already known to the Muslims, though as yet unadapted to their navy. By one account, however, when news of the debacle at Kyzikos reached Caliph Mu'awiyah ibn Abi-Sufyan in Damascus, he promptly sent word to his dockyards in Alexandria, home of some of the best shipbuilders in the Eastern Mediterranean, to equip his galleys with the "firespouting devices" of the Byzantines. This raises a historical question: Could Kallinikos have changed sides just as the Muslims were about to bring their own petroleum-based weapons to the battle scene? The answer lay not at sea, but in the heart of Arabia.

Shortly after the defeat at Kyzikos, Mu'awiyah lay dying, causing a crisis far more serious than the failure of his designs on Constantinople. He called Yazid, his son, and warned him that he must soon face 'Abd Allah ibn al-Zubayr, the rebellious governor of the Hijaz, who would surely contest Yazid's succession. Yazid, the Caliph advised, should send his trusted friend Ibn 'Uqbah to strike at 'Abd Allah. In 683 the conflict began.

Ibn 'Uqbah, a frail, one-eyed man nearly 70 years old, was summoned to Damascus from his farm in the mountains of southern Syria, and was put in command of a crack army of 20,000. Knowing that resistance from Makkah was likely to be fierce and protracted, he spared no effort in equipping the expedition with the latest in siege equipment, including a new piece mentioned for the first time in Muslim annals: a *manjaniq*, or mangonel, a kind of heavy-duty catapult, designed to bombard enemy fortifications—or cities—with projectiles of flaming naphtha.

Probably attempting a surprise, the men, horses and camels loaded with the deadly weapons began their march south across the Nafud Desert in August, when the temperature in the shade hardly ever dips below 43 degrees (110°F), and there is no shade. No invader had ever dared cross the Nafud in summer, and the heat proved unforgiving. Ibn 'Uqbah himself had to be carried most of the way.

Three days after arriving outside Madinah, he gave the holy city three more days to surrender. Then he sacked it with all force, leaving his bed only once to incite his hesitant troops. On discovering that 'Abd Allah had slipped away to Makkah, he set off in pursuit, only to die of exhaustion a few kilometers down the road.

Under a new commander, the Umayyad troops then embarked on a siege of Makkah. Reluctant to enter the holy city, the Umayyads mounted a battery of their fire-hurling mangonels on a nearby hill and began a systematic bombardment that was to last nine weeks. In desperation, 'Abd Allah ibn al-Zubayr sought refuge in the *haram*, the holy precinct that surrounds the Ka'bah. Despite Umayyad efforts to spare the shrine, a flaming projectile struck the Ka'bah midway through the siege. At first the *kiswah*, the black cloth covering the shrine, caught fire, and then, as the heat became more intense, the Black Stone built into one corner of the Ka'bah split into three pieces. At the end of the disaster, the house of God, according to a Muslim writer, "looked like the torn garments of mourning women."

For another month, neither 'Abd Allah nor the Umayyads were willing to budge. Then, just as 'Abd Allah was considering surrender, the Umayyad forces received word to withdraw immediately, for Yazid had died and the troops were needed in Damascus.

SACKLER MUSEUM, HARVARD UNIVERSITY. GIFT OF EDWARD W. FORBES

In this 14th-century Persian miniature from the Demotte copy of the "Shahnama," the Iron Cavalry of Alexander the Great rides wheeled, fire-spouting mechanical horses filled with naphtha—a variation on the naphtha-based weapons common in the artist's era.

Nine years later, another Umayyad army returned to the holy city with its mangonels, catapults and oil incendiaries. For more than half a year fires raged around the *haram* until 'Abd Allah was finally slain and the authority of the Umayyad caliphate over Makkah was restored.

The extent of the use of petroleum-based weapons in the two campaigns against 'Abd Allah ibn al-Zubayr, the first one only three years after Kallinikos taught the secret of the new fire to the Byzantines, demonstrates that the Muslim forces in Syria had access to oil and could transport it and deploy it anywhere in their empire. But the Umayyad army, it turns out, was not alone among the Arabs to have used oil as early as the seventh century.

While fighting was raging at Makkah in the summer of 683, a physician named Masarjawah was busy in the city of Basra, in what is today southern Iraq, translating the first medical text ever put into Arabic. That this book was written at all was no small feat, for at that time, written Arabic as we know it today was in its infancy. But Basra was then the largest military camp in the Gulf area, and the Muslim commanders were eager for a manual with which to train their medics. Masarjawah, the most prominent physician in the city, was commissioned by agents of the caliph to work on the project. What resulted was *Kitab Qiwa al-'Aqaqir*, or *The Book of the Powers of Remedies*, a collection of herbal recipes taken from a text originally written in Greek by an Egyptian priest and later translated into Syriac, the common language of many parts of the Middle East in pre-Islamic days. It was in this book that the term "water-white naphtha" was first used in Islamic medicine.

Masarjawah's book, much of which is now lost, was the first work in Arabic to teach the benefits of ingesting oil—naphtha—for fighting disease and infection. From that time onward, right up to the beginning of the present century, every other Muslim physician echoed, in more or less the same words, what Masarjawah wrote: "Warm naphtha, especially water-white naphtha, when ingested in small doses, is excellent for suppressing cough, for asthma, bladder discomfort, and arthritis."

How the Muslims obtained the oil is another story. In many areas of the Muslim world, especially the lands that now comprise Kuwait, Iraq, Iran and the newly independent republics of Azerbaijan, Turkmenistan and Uzbekistan, oil upwellings and gas vents had been known since the beginning of time. The Mesopotamian peoples who built some of the first civilizations were also the first to describe crude oil oozing from natural wells. Akkadian clay tablets from about 2200 BC referred to crude oil as *naptu*—from which derives the root of the Arabic *naft* as well as the Greek *naphtha*, the Hebrew *nepht*, the old Persian *naptik*, and the modern Farsi *neft*. In the modern era, it was these same surface seepages that attracted Western oil prospectors to the region. The first productive oil well in Iraq was sunk in 1927 at Baba Gurgur, some 225 kilometers (140 miles) north of Baghdad, almost within view of a natural oil spring called "Eternal Fires" that had been burning continuously since at least 600 BC.

When the Muslim armies first arrived in Iraq and Persia around 640, they found hundreds of open oil pits. Arab records from the 10th century show that the province of Faris, in Persia, paid an annual tribute of 90 metric tons of oil to light the palace of the caliph. And an early Muslim historian, Ibn Adam, wrote that the Arab governors of northern Iraq refrained from taxing the oil- and mercury-producing industries in their districts as an incentive to boost production. Clearly the demand for oil was high.

Of these oil pits, the largest and most famous in medieval times were at Jabal Barama, east of the Tigris in the north of Iraq, and the well of Dir al-Qayyara near Mosul. The caliph leased this latter well to private entrepreneurs, we are told, and derived thousands of dirhams of annual revenue from them. So vast and strategically important was the pit at Dir al-Qayyara that at one time it had to be guarded day and night; it provided not only crude oil but most of the bitumen used by the state to pave roads. In the early 13th century, the geographer Yaqut described how "asphalt" was made from this pit:

> There are workers who collect [bitumen] from the spring in woven reed baskets and pour it over the ground. They also have large iron kettles placed over cauldrons which they load with known proportions of bitumen, water and sand. They then light the cauldrons and heat the mixture until the bitumen melts and mixes with the sand while the workers are continually stirring it. When the stirred mixture reaches the right consistency it is poured over the ground as pavement. People visit this site on outings and to drink the water that comes out with the bitumen. They also bathe in the water, for it is as good in clearing pustules and other diseases as public baths and other remedies. This spring is under guard at all times.

The heated cauldrons and constant stirring of the medieval roadworkers were in fact not fundamentally different from today's more mechanized methods. Yet in Europe, roads paved with anything but flagstones or cobbles were unknown until 1838, when asphalt was first laid on a street in Paris.

By the early ninth century, the strategic and economic importance of oil led the Abbasid caliph in Baghdad to appoint what we might today call an "oil czar" in every major producing district. The *wali al-naft*, as he was called, acted as the eyes, ears and, above all, the tax-collecting arm of the caliph in the lucrative oil works. An excerpt from a poem addressed to such a *wali* by a disillusioned friend reads:

> You, where is your modesty?
> As if you'd been given the throne itself!
> If by guarding the stinking wells
> You have gained such aloofness,
> How would you behave if instead
> You were guarding amber and musk?

Two developments around the year 850 increased the power of the oil czars. The first was the increased demand from a new fighting

BY THE EARLY NINTH CENTURY, THE ABBASID CALIPH HAD APPOINTED AN "OIL CZAR" IN EVERY MAJOR PRODUCING DISTRICT.

AMERICAN NUMISMATIC SOCIETY

Byzantine Emperor Constantine IV used oil-weapon technology from Umayyad Damascus to break the Arab siege of Constantinople, leading to the misnomer "Greek fire."

KEROSENE LAMPS WERE IN EXISTENCE IN THE MUSLIM WORLD MORE THAN A THOUSAND YEARS BEFORE THEY BECAME KNOWN IN THE WEST.

corps established in the regular Abbasid army called the *naffatun*, or naphtha troops. The second was the introduction of refined lamp oil, or kerosene, manufactured from crude oil by distillation. This was what the Muslims called white naphtha, or *naft abyad*. It was made then much as it is today, except that instead of high-volume, continuous-process distillation towers, the medieval Arabs used an apparatus called *al-inbiq*, a batch-process still whose name we have taken into English as *alembic*.

Essentially, the alembic consisted of three parts: a gourd-shaped lower flask called the cucurbit in which the crude oil was heated; a cooled, spouted condenser that sat atop the cucurbit and received the vapors that rose from the oil; and a receiver at the end of the condenser's spout in which the clear distillate was collected.

In Abbasid times, every school of chemists had its own variation of the alembic. Some were made of blown glass like today's labware, others were made of ceramic, copper or brass. Some were built for laboratory use, while others were much larger and might properly be called industrial stills. The Syrian naturalist al-Dimashqi wrote that in the early 13th century there was a quarter of Damascus known as *Suq al-Qattarine*, the distillers market.

The first Muslim scholar to write about the distillation of petroleum was the Persian-born Muhammad al-Razi, who spent most of his adult life in the late ninth century as a physician and chemist in Baghdad. In his *Kitab al-Asrar*, or *Book of Secrets*, he mentions the use of *naffatah*, or kerosene lamps, for heating and lighting, establishing that such devices were in existence in the Muslim world more than a thousand years before they became known in the West. He gives two methods for making kerosene, one using clay as an absorbent and another using sal ammoniac (ammonium chloride). The distillation is to be repeated until the distillate is perfectly clear and "safe to light," meaning that the volatile hydrocarbon fractions had been substantially removed.

Distillation made possible the use of kerosene throughout the entire Middle East, bringing it to such places as Palestine, Yemen, the Hadhramaut and Egypt, none of which had any surface deposits of oil to speak off, but all of which had substantial deposits of either oil shale or bitumen. With either of these substances, a reasonably good grade of kerosene could be obtained by first extracting the oil by heating the rock, and then distilling the oil in the alembic. Speaking of the shale found around the Dead Sea basin, al-Dimashqi wrote: "The so-called 'stone of Moses's tomb' (may God bless his soul), found east of Jerusalem, releases naphtha when it is broken to pieces and then distilled in the alembic in the same manner as rose-water. When you light this rock it burns like wood."

As knowledge of oil grew, so did further refinements of its military applications. With the systematic exploitation of the large pits, enough oil was obtained to burn down both Baghdad and Cairo, two of the region's largest cities, in catastrophes that far surpassed the siege of Makkah.

Baghdad in the year 800 was the undisputed capital of the Muslim state and the seat of Harun al-Rashid, one of the most powerful rulers of his time. The city's position on the west bank of the Tigris put it in contact with all parts of the then-charted world. One-third of the city's area was occupied by the Golden Gate, the royal palace, and the rest of it included, in addition to the dwellings of more than one million inhabitants, hospitals, paper mills, a postal headquarters, a military academy and several institutes of higher learning. However, by 813 the royal palace was gone, and much of the city lay in ruins.

Between 809 and 813 Iraq and Persia engaged in a civil war that pitted two of Harun al-Rashid's sons, Amin and Ma'mun, against each other. After two battles in Persia, in which Amin's forces were crushed, Ma'mun hoped to trap his brother in Baghdad. He had one of his commanders, a Turk named Tahir, march on the city from the west, while Ma'mun attacked it from the north and east. Tahir was determined to take the city even at the cost of its total destruction. He had his naphtha troops, equipped with hundreds of mangonels, bombard a section of the city called Harbiyyah with barrels of burning naptha. The resulting fires eventually engulfed the rest of Baghdad, causing its residents to flee. So total was the destruction that it was not until six years later, in 819, that Ma'mun, who had succeeded his father, reentered the city and began its reconstruction.

Cairo's turn came three centuries later, in the thick of the crusades. By that time, petroleum-based weapons had reached further levels of sophistication.

In 1167, the crusader king of Jerusalem, Amalric I, decided that the time had come for the Christians to make a final attempt to annex Egypt to their holdings in the Levant. He had already crossed the Sinai on four previous occasions to intrude on the crumbling Fatimid regime (See *Aramco World*, September-October 1994). This time, however, his own crown was at stake, threatened by the Syrian Atabegs, who had vowed to evict the crusaders from the lands of Islam. A victory in Egypt would provide the resources to resist Syria.

At the head of an army of several thousand, Amalric crossed the Negev and Sinai deserts and arrived at Bilbeis, northeast of Cairo, which he sacked after slaughtering nearly all its inhabitants. He then set up camp just south of Fustat, or Old Cairo, and sent word to the Egyptian caliph 'Athid, then only 18 years old, to quit the city or face the fate of Bilbeis. But 'Athid was upstaged by his vizier, Shawar, who not only had his eyes on 'Athid's throne, but who had also, years ago, been allied with Amalric and betrayed by him. In revenge, Shawar swore to deny Amalric the satisfaction of capturing the city intact. "Instead of Fustat," he is said to have shouted, "they will get a mound of rubble!"

The horrors of the ensuing days were recorded vividly by the Egyptian historian al-Maqrizi:

> Shawar ordered that Fustat be evacuated. He forced [the citizens] to leave their money and property behind and flee for their lives with their children. In the panic and chaos of the exodus, the fleeing crowd looked like a massive army of ghosts.... Some took refuge in the mosques and bathhouses...awaiting a Christian onslaught similar to the one in Bilbeis. Shawar sent 20,000 naphtha pots and 10,000 lighting bombs [*mish'al*] and distributed them throughout the city. Flames and smoke engulfed the city and rose to the sky in a terrifying scene. The blaze raged for 54 days....

That the whole city could be set alight with "naphtha pots" on relatively short notice is an indication that during the era of the Crusades oil was readily available in military warehouses and that, in Cairo at least, it was available in large quantities. The oil in Cairo may have been imported from Iraq, Persia or the Caucasus, but most likely it was brought from the wells of Jabal Tor on the southwestern edge of the Sinai, a seepage which had been exploited since Roman times. Of it, an Arab writer of the 10th century wrote, "There exists one variety of naphtha known there as 'oil of the mountain' and its finest is the kind that is pure, transparent white, and volatile."

Nothing in the writings of Egyptian historians about the burning of Cairo gives clues as to what exactly these "naphtha pots" were. It was not until 1916 that two archeologists, Ali Bey Bahjat, director of the Cairo Museum, and Albert Gabriel, a Frenchman, unraveled a mystery that tells a little-known story of Muslim technology at a time when Islam was threatened simultaneously by the crusaders and the Mongols.

The two men set out to excavate in the rubble of Old Cairo in search of the peculiar broken clay pots, resembling hand grenades, that Egyptian "night diggers" occasionally sold to Western visitors. Years before, in fact, Gabriel himself had purchased one from a street peddler. He had taken it back to France for examination and concluded that it might well be one of those pots used to burn the medieval city.

By 1916, Bahjat and Gabriel had gathered dozens of nearly intact "naphtha pots" of different types, and fragments of hundreds more. Indeed, the pieces had been found throughout the old city, lending support to Maqrizi's account of the tragic events of 1167.

In the 1940's, the pots caught the attention of yet another French scientist, Maurice Mercier. He noticed that those that had the strongest walls and the most aerodynamic designs often had their tops broken off, while the rest of the body was intact. Only a powerful internal explosion, he reasoned, could have caused such clean, sharp fractures. He had a number of the pots carefully examined and discovered that they contained traces of nitrates and sulfur, essential ingredients of gunpowder. Apparently the several varieties of "naphtha pots" used to destroy Old Cairo, many now on display in the Cairo Museum and the Louvre, were each something between a Molotov cocktail and a crude hand grenade, filled with a volatile jelly of kerosene, nitrates and sulfur.

Clearly, the makers of the firebombs were technicians with a sophisticated knowledge not only of explosives and incendiaries, but also of soil sciences and ceramics. They must have known which clay to use with which kind of bomb and to what extent to harden and glaze it. And because these bombs were thrown not only by hand but also by mangonel, their makers must also have known mechanics and at least the rudiments of aerodynamics.

These discoveries shed further light on a unique Arab manuscript brought to the Bibliothèque Nationale in Paris in the mid-19th century and titled *The Book of Horsemanship and the Art of War*. Written in 1285 by Najm al-Din Ahdab, a Syrian officer, the book is packed with information on how to distill oil to make kerosene; how to prepare explosives from gunpowder; how to fit the multiple fuses into the various kinds of "naphtha pots"; and even how to build "flying fire"—rockets! The author includes sketches of the weapons he mentions, and one is indeed a crude missile armed with a "naphtha pot."

That petroleum was indeed known and widely used in the early Muslim world, as the author of *The All-Encompassing Dictionary* tells us, cannot be doubted. In fact, we may say that the most important period in the history of oil prior to our own age, the age of the internal-combustion engine, unfolded during the flowering of the Muslim civilizations that some have called "Islam's Renaissance." We shall see in Part 3 of this series that this was true not only in the Arabic-speaking Middle East, but in Muslim Central Asia and the Caucasus as well.

Dr. Zayn Bilkadi was born in Tunisia and studied at the American University of Beirut, the University of Rochester and the University of California at Berkeley. He is a senior research specialist at 3M Corporation and holder of nine patents.

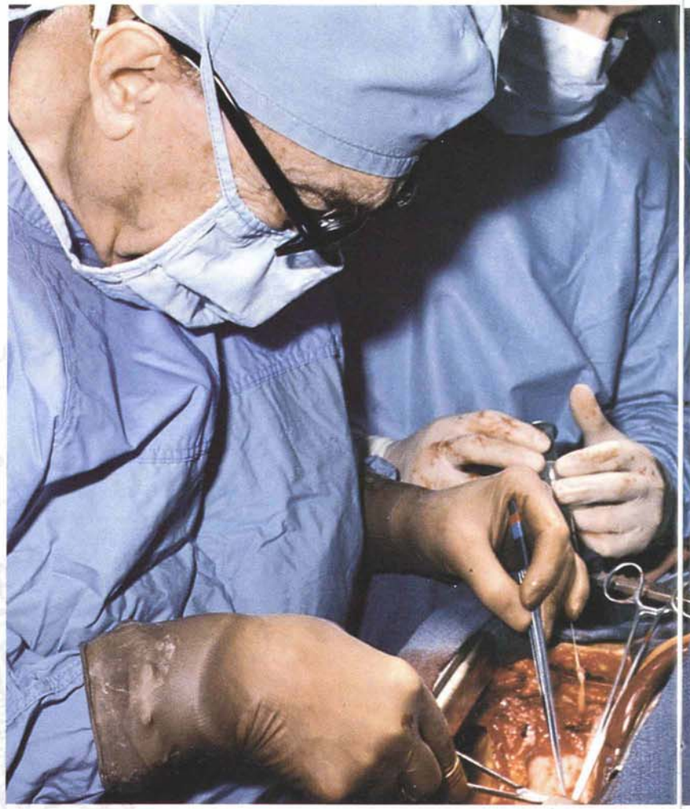
Many of the "naphtha pots" used to burn medieval Cairo were not much larger than a man's fist. Archeologists believe the explosives used a kerosene-soaked rag as a fuse.

The Doctor Doesn't Miss a Beat

WRITTEN BY ARTHUR CLARK

Is Dr. Michael E. DeBakey, the "Texas Tornado" of medicine, slowing down at age 86?

Far from it, says the Arab-American surgeon, who pioneered the techniques now commonly used to prevent strokes and treat aneurysms, and was the leader in the field of heart-bypass surgery. Instead, the dynamic doctor is still working at a dizzying pace at Houston's Baylor College of Medicine, inside the operating room and out. Lately, he's even linked up with the National Aeronautics and Space Administration to blaze new trails in medicine.



With the help of a NASA engineer on whom he performed a heart-transplant operation a decade ago, DeBakey enlisted the aid of NASA hydraulics specialists to help develop the world's first artificial heart designed for permanent implantation into humans. DeBakey thinks the small, battery-powered pump will be ready to use by 1999, allowing thousands of people with disabling heart problems to return to normal lives.

Not only that, but he's joined NASA in a "telemedicine" project that could soon make the planet's top medical resources available almost anywhere on the globe.

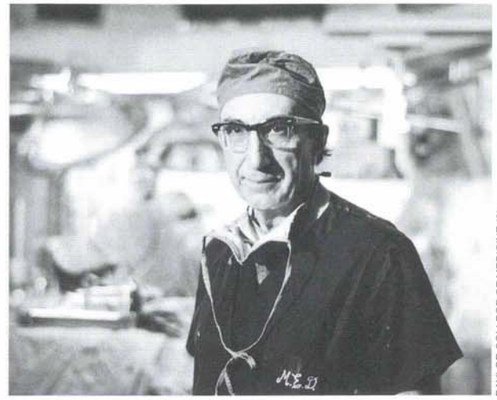
He's also continuing his long quest to find the root cause of atherosclerosis, or blockage of the arteries. It accounts for most cardiovascular disease—which is the leading cause of death in the United States and Canada, claiming more than a million lives each year in those countries, and millions more around the world.

DeBakey's colleagues once nicknamed him "The Texas Tornado" for his 20-hour days, when he sometimes spent 14 hours at a stretch in the operating room. Today he admits that the "balance" of his labor has shifted more and more from surgery toward research and writing in recent years. But his pace remains unchanged.

"I'm still consumed by my work," he says in his office at the Methodist Hospital in the Texas Medical Center. "Sometimes I feel like I'm drowning for lack of time."

The walls of his office and of the hallway outside are covered with awards, photographs and honorary degrees from around the world. He's shown with Lyndon Johnson, who awarded him the Presidential Medal of Freedom, with Ronald Reagan receiving the National Medal of Science, and with former President George Bush and the late President Turgut Özal of Turkey. There is a picture of former Surgeon-General C. Everett Koop with DeBakey, with a dedication calling DeBakey "a role model for us all."

Although he resigned as chairman of the department of surgery at Baylor's College of Medicine in 1993, DeBakey remains its chancellor and most distinguished professor of surgery. He still takes part in complicated surgery at Baylor-affiliated Methodist Hospital, and he continues a heavy correspondence with his former patients and their doctors. He still travels widely—Russia, Finland and Florida were all on his schedule in one month last summer—to lecture and to follow up on cardiovascular programs he's helped establish.



BAYLOR COLLEGE OF MEDICINE (2)

DeBakey credits his Lebanese parents with instilling in him self-discipline, social responsibility and high ethical standards.

Patients still come from around the world to put themselves in the hands of the master surgeon with more than 60,000 operations to his credit.

The surgeon who has achieved so much in six decades of work is the son of Lebanese immigrants. DeBakey's father was a pharmacist and entrepreneur in Lake Charles, Louisiana, who owned drugstores, farms and real estate. DeBakey credits his parents with instilling in him the self-discipline and social responsibility that are the hallmarks of his career.

"We weren't spoiled, but we never went without," says DeBakey. His father's business success even enabled the family to return to Lebanon to visit relatives in the Marjayoun area when DeBakey was 12. Caring professions figure prominently in his family tree: "There were quite a number of doctors on my father's side," he notes, and his maternal grandfather was a Greek Orthodox priest.

Recently, DeBakey has been reaching back to his roots. Through the Task Force on the Reconstruction of Lebanon he's been involved in the early discussions on developing a new medical school in the country, possibly in Byblos.

As the eldest of five children, DeBakey says he was expected to set the example for his siblings. He obviously succeeded: Four DeBakey siblings appear in *Who's Who in America*, in science or science-related fields.

DeBakey started medicine in high gear in 1932 and has never really slowed down.

"The thrust [in the family] was that we think and learn for ourselves," he says.

Part of the children's routine was to read a book a week in addition to their normal schoolwork. On one trip to the library, DeBakey remembers, he discovered the *Encyclopaedia Britannica*, but wasn't allowed to check it out.

"So my father got a set for all of us, and by the time we went to college we had all read the entire encyclopedia," he says.

His parents' influence wasn't all academic in nature. DeBakey's dad was an inveterate tinkerer, and his skills extended to his sons, both of whom became surgeons.

"When I was 13, my father bought me and my 10-year-old brother an old Studebaker, and we took it apart and made it run," says DeBakey. "I think his idea was that if you kept the mind busy, you kept out of mischief."

DeBakey learned to sew as a preschooler, when his mother was giving sewing classes to neighborhood girls. "I was fascinated with her artistry and became a student, too," he says.

That training has helped him in his profession, he says. Indeed, he sewed the first Dacron graft—a product used worldwide today to replace diseased arteries—on his wife's sewing machine in the early 1950's.

"Sewing makes you precise in what you do. The stitches have to be just right. And the cutting of patterns gives me an eye, so I don't have to take a measurement when I'm doing a graft replacement," he says.

DeBakey has carried out more than 60,000 cardiovascular procedures, trained more than 3000 doctors and written or co-written more than 1300 articles, chapters and books in his career. As well as writings for fellow physicians, he's also co-authored a series of books for the general public. Two, *The Living Heart* and *The Living Heart Diet*, made *The New York Times*' best-seller list. The latest volumes in the series, *The Living Heart Brand Name Shopper's Guide* and the *Living Heart Guide to Eating Out*, appeared in 1992 and 1993.

DeBakey started medicine in high gear and has never really slowed down. As a medical student in 1932, he developed the roller pump that later became a critical part of the heart-lung machine—the equipment that made open-heart surgery possible. He was also the first to use an artificial heart pump successfully in a patient, in 1966.

DeBakey has been working on a permanent artificial heart for 30 years. Previous mechanical hearts, such as the famous Jarvik model of the 1980's, were air-powered and didn't work as permanent replacements. A year ago, however, DeBakey showed President Bill Clinton his new heart pump and went on "CBS This Morning" to introduce it nationwide.

The device, which is now being tested in animals, "could replace having a transplant," DeBakey told the television audience. "Remember, there are only about 2000 donors available for transplants in this country [per year]. A third of the patients that we put on transplant lists die before we can get a donor."

There are "probably 100,000 to 150,000 patients who need this type of device to be restored to normal activity," he said.

The valveless pump weighs only about 50 grams (less than two ounces) and is just 7.5 centimeters (3") long and 2.5 centimeters (1") in diameter. That makes it much lighter and smaller than today's mechanical hearts, which weigh between 3.5 and 4.5 kilos (8 to 10 lbs.) and are used only as "bridges" until a donor heart can be found. Two of DeBakey's tiny pumps could be paired to replace both of the heart's two chambers.

The pump uses under 10 watts of power to run—about one hundredth of what the average home steam iron draws. Its battery is recharged through the skin; the user will put on a special vest and plug it into a normal household current.

The price? DeBakey reckons his pump will cost $10,000, compared with $50,000 for today's artificial hearts.

The Texan isn't the only physician working on a permanent artificial heart pump. Last August, for example, British doctors successfully implanted a battery-driven heart-replacement pump in a human patient, in the first test of such a device as a long-term alternative to heart transplantation. But DeBakey shrugs off any suggestion that that success will short-circuit his own work. "Of course not. Not at all," he says.

The pump used by the British team "is bigger and requires more power to run," he explains. It's also more expensive: Press reports put the price of the device at $60,000.

Next door to his Houston office, DeBakey also proudly shows off part of another NASA-linked project: a telemedicine "hub." From a control center that looks like the set of "Star Trek," facing two large-screen television monitors, DeBakey can direct cameras to help carry out patient diagnoses, or even surgery, at a distant location. The hub is now hooked to a "distant" room just one floor down, but soon it could be receiving data from facilities thousands of kilometers away, via satellite or fiber-optic or telephone lines.

"I think it's going to have a tremendous impact. Using a mobile unit in a van, you can consult even where there isn't a doctor available," DeBakey says. That applies equally to sparsely populated areas of Texas, or locations abroad.

DICK DOUGHTY/ARAMCO WORLD

A bust commemorating DeBakey's international legacy stands in Methodist Hospital, Houston, where he currently operates.

"Remote areas in Saudi Arabia could be linked to the King Faysal Specialist Hospital in Riyadh," says the doctor, who helped set up the cardiovascular program there in the 1970's (See *Aramco World*, July-August 1979).

Currently, DeBakey is working with officials at the Özal Medical Center in Malatya, in southeastern Turkey, to establish a telemedicine center that could meet the needs of people in isolated areas there.

Why won't the "Texas Tornado" slow down? Too many challenges remain, he says.

"There is so much yet unknown in my field," says DeBakey. "I have no plans to retire. I've got too much to do."

Arthur Clark is a staff writer for Saudi Aramco in Dhahran, and a frequent contributor to Aramco World.

TOPKAPI'S TREASURES

Topkapı Palace, once the imperial residence and seat of government of the Ottoman Empire, is still a treasure-house of precious objects collected by the sultans.

PHOTOGRAPHED BY ERGUN ÇAĞATAY

TEXT ADAPTED BY ERGUN ÇAĞATAY FROM
THE TOPKAPI SARAY MUSEUM: THE TREASURY BY CENGIZ KÖŞEOĞLU,
EDITED BY J.M. ROGERS AND PUBLISHED BY THAMES & HUDSON. COPYRIGHT 1987.

Topkapı Palace grew to be a city in itself, whose kitchens (under the domes at right, above) fed 3000 to 5000 people daily. The view in this photograph is north across the Bosporus toward Dolmabahçe Palace.

The insides of this zinc jug and flask are plated with gold; the outsides are set with turquoises and rubies. The set was made in Iran about 1500, and is registered in the Treasury inventory as ganimet*—booty.*

ERSIN ALOK

The Byzantines ruled their empire from an acropolis perched on the southern peninsula of Constantinople, commanding a superb view of the Sea of Marmara, as well as the Golden Horn and the Bosporus. Before Sultan Mehmet II, dubbed *Fatih*, or the Conqueror, took Constantinople in 1453, vanquishing what had been a Byzantine island in the midst of his empire, the capitals of the Ottoman sultans had been at Bursa and Edirne. But from this time on, the city now known as Istanbul became the new seat of the Ottoman Empire.

About 20 years later, Mehmet II moved his official residence from the Eski Saray, or Old Palace, to the acropolis; the sultan's new residence was called Topkapı Sarayı, or Palace of the Cannon Gate, a name that recalls the bristling armaments of a now-vanished sea-gate in the surrounding defensive walls.

On this site were erected many new buildings. While most of the early palace structures were made of wood—yielding to more solid stone buildings in the empire's later years—the Hazine, or Treasury, constructed in 1468 and 1469, was built from the start as a massive stone structure.

Topkapı Palace, although it functioned as the sultan's residence, with splendid reception rooms, enormous kitchens and separate women's quarters, was also the heart of the Ottoman Empire. It served as the religious center, the brain of the administration and the storeroom for the State Treasury. As the empire grew, Topkapı expanded into a self-sufficient entity with its own schools, libraries, baths, chancery, prisons and even a room containing relics from Makkah and Madinah. Between 4000 and 5000 people lived permanently in the palace.

Especially during the 17th and 18th centuries, Topkapı Palace served as the empire's administrative center, and thus contained several treasuries. The financial heart of the palace was the State Treasury, located in the Second Court, which contained mostly archives of the finance department and provincial revenue collection.

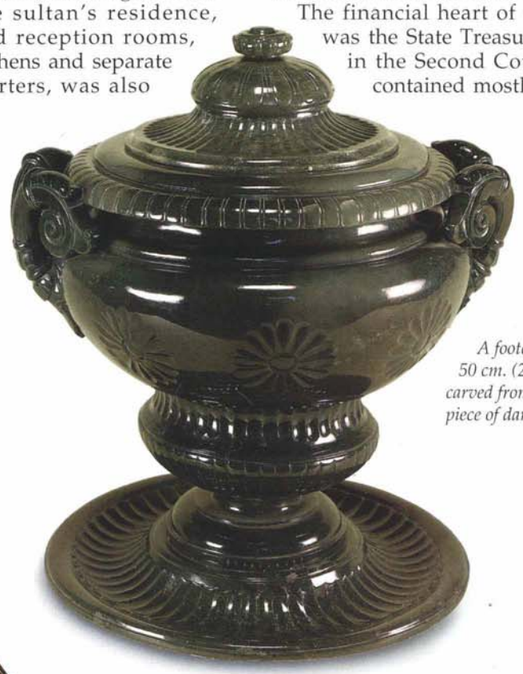
For reasons that are not quite clear, the State Treasury was divided into inner and outer parts. The Outer Treasury was apparently used as a kind of depot for robes and cloaks of honor, which were given to ambassadors before their audiences with the sultan.

The other treasuries were not state treasuries but the property of the sultan himself, and access to these was extremely restricted. The most famous of these was the Enderun (or Palace) Treasury, situated in the Third Court at Fatih Pavilion, named after Mehmet II. The officials working in this treasury were very high-ranking members of the imperial household.

The oldest description of the Enderun Treasury appears in the writings of Jean Baptiste Tavernier, Baron of Aubonne, and is based on information given him in India by two former Ottoman treasury officials.

"The Third Chamber is very spacious," he wrote in 1684, "and is more like a great hall. The first thing that entertains your Eye, is a great Coffer, the inside whereof is divided into three parts and makes as it were Three other Coffers, one upon the other: but they are open'd all on the outside, so as that if there be anything look'd for in the undermost, there is no necessity of stirring the uppermost. The lowermost Coffer contains those sumptuous Coverings for the Grand Seignor's Throne, of which I have spoken in the Description of the Hall of audience. In the middlemost are dispos'd the Housses and Trappings, enrich'd with embroidery, and some of them with Pearls and precious Stones, which are used in great Solemnities. In the uppermost Coffer, are kept the Bridles, Breast-Pieces, Cruppers, and Stirrups, which are recommendable upon the score of the Diamonds, Rubies, Emeralds, and other Precious Stones, whereby they are enrich'd: but the greatest part of them is cover'd with Turkish stones [turquoises], which they have the art of setting excellently well."

The treasuries, however, were customarily sealed with the seal of Selim I to the very last day of the empire.

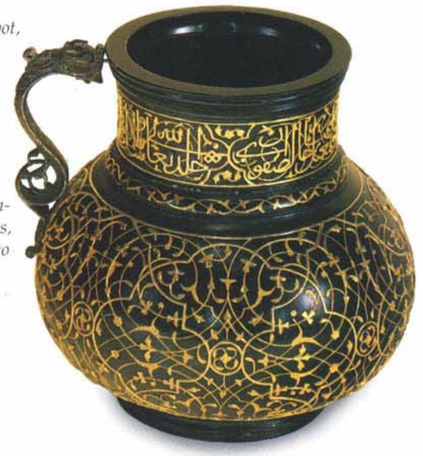


A footed tureen 50 cm. (20") tall was carved from a single piece of dark jade.

Painted carnations and leaves decorate a lacquered shield some 300 years old, but its gold-filigree central boss, set with emeralds and a ruby, may be a reused part of an older piece.

Gifts and mementoes sent to the Ottoman sultans by dignitaries and their fellow rulers included this relatively modest papal cameo surrounded with pearls, enamel and gold.

This dark-green jade pot, 14 cm. (5½") high, once furnished the Safavid palace at Tabriz, and probably passed into Ottoman hands after the Battle of Çaldıran in 1514. Before that, the dragon-headed handle suggests, it may have belonged to a Timurid ruler.



Because smoking a waterpipe was a communal pleasure, the mouthpieces used were personal possessions, each smoker attaching his own mouthpiece—like these jewel-studded amber examples—as the pipe was passed around.

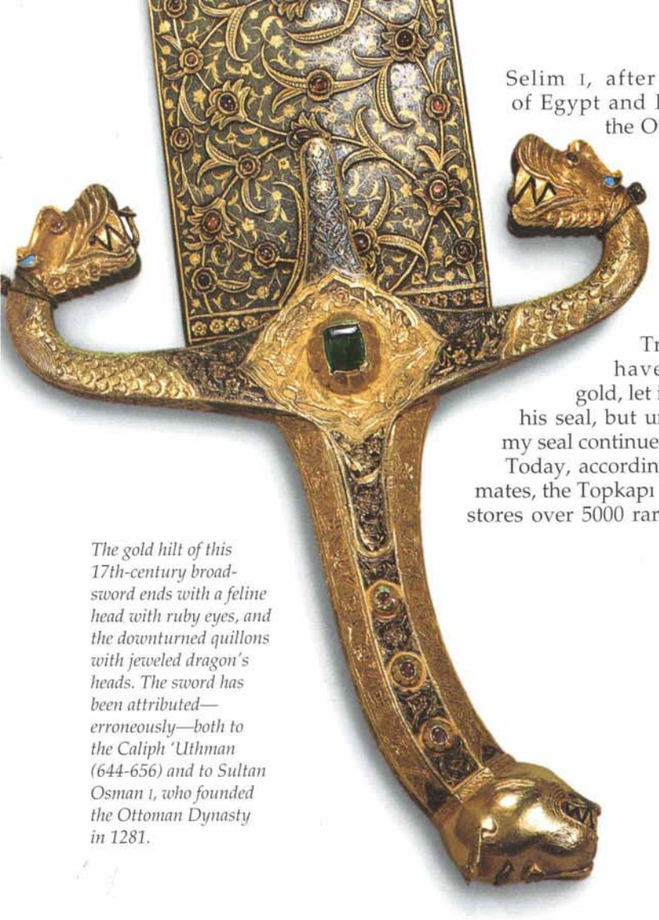
Emeralds, rubies, diamonds and garnets encrust a gold-plated bow-case that may be the one given to Sultan Mehmet IV by his mother, Turhan Sultan, at the inauguration of Istanbul's Yeni Cami, or New Mosque, in 1663.

Selim I, after his conquest of Egypt and Iran, expanded the Ottoman treasury to such an extent that in his will he commanded, "If any of my descendants adds even copper to the Treasury which I have filled with gold, let it be sealed with his seal, but until that day let my seal continue to be used."

Today, according to rough estimates, the Topkapı Palace Treasury stores over 5000 rare items personally collected by the Ottoman sultans. Of the collected pieces, very few items of gold and silver have survived to this day: Beautifully crafted creations of great artists and artisans, special gifts from Habsburg, Tartar and Özbek rulers, trays and plates from the Safavid Shahs of Iran, offerings of Moghul emperors of India, all went to the mint to be melted down for the *sikkes* coinage during hard times—an embarrassing but common practice of the day, even among Western European rulers. In addition, the Ottoman state maintained a traditional Islamic cash economy almost to the end, keeping its officials in constant search of money. Despite such historical shortcomings, the contents of the Enderun Treasury survived in large part. After the fall of the Ottoman Empire, the collection was eventually incorporated into the Topkapı Museum when the old palace was declared a state museum in 1924. Exhibition space at the Treasury is far too limited to display the complete collection. Yet even though only a selected portion can be exhibited, today Topkapı equals and in some ways surpasses the two great surviving European imperial collections, that of the Habsburgs in the Schatzkammer at Vienna's Hofburg, or Imperial Palace, and that of the Russian Tsars, displayed in the Kremlin Armory in Moscow.

For the Ottoman sultans, the Treasury was a place to store everything rare and valuable—precious stones, beautifully crafted objects, pelts and books, as well as perfumes like musk, amber and sandalwood, and even rock candy, which was very rare in those times. The list can be expanded to include religious relics and even the keys of conquered castles. In the palace archives, inventories date back as far as January 17, 1505, during the reign of Beyazıd II. This first inventory provides detailed information on each item, and includes gold-threaded silk, silver-threaded velvet and other textiles, carpets, saddles, richly decorated horse trappings, parade harnesses, bows and arrows made by master craftsmen, firearms, richly decorated swords, calligraphy of great masters, copies of the Qur'an, illustrated manuscripts, ivory, coral, tiger skins, uncut blocks of jade, clocks, chess sets and gaming pieces, Chinese procelains and fine pottery, astronomical and musical instruments, ostrich eggs, paper, and spices.

There were no general rules for inventories, which were usually held each time a new sultan ascended the throne or whenever he specifically requested it. In later years, Treasury inventories became more comprehensive and systematic, like the one in 1680, for example, held after the discovery of theft by Vizier Mermer Mehmet Paşa, who had abused his earlier position as *kethüda* (Chief Doorkeeper) of the Treasury.



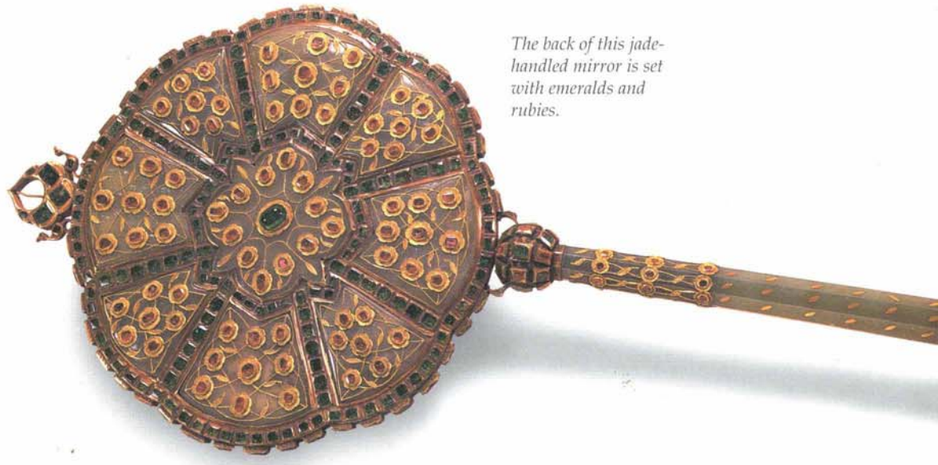
The gold hilt of this 17th-century broadsword ends with a feline head with ruby eyes, and the downturned quillons with jeweled dragon's heads. The sword has been attributed—erroneously—both to the Caliph 'Uthman (644-656) and to Sultan Osman I, who founded the Ottoman Dynasty in 1281.

Tavernier and other Westerners much admired the convenience of using a ewer and basin, Ottoman style, to wash with after eating. This solid-gold set belonged to Sultan Abdülhamid II and bears his monogram.

Forty cm. (15¾") across, this bowl too was carved from a single piece of jade.

A model Japanese palace, exquisitely detailed, was a gift from a Japanese emperor.

Cases made to protect and transport particular copies of the Qur'an were typically embroidered with gold or silver thread and enriched with seed pearls or precious stones.



The back of this jade-handled mirror is set with emeralds and rubies.

Gifts, tribute and booty were the most important sources of treasury income. *Muhalefat*—the estates of viziers and other public officials who in theory were the sultan's slaves (*kul*) and therefore barred from owning personal property—were another major source of both revenue and acquisitions. Grand viziers and provincial governors enjoyed vast opportunities for unseemly self-enrichment; such an official could face trial and eventual execution, with confiscation of his property an inevitable part of the process.

Hundreds of objects in the Treasury were commissioned by individual sultans for themselves, like the *yatağan*, or short sword, with its inlaid ivory hilt, made for Süleyman the Magnificent. Court workshops employed a large number of craftsmen, who were members of corporations or guilds and regarded as a palace elite.

Court craftsmen thrived from the beginning of the 16th century to the end of the 18th, their numbers varying between 40 and 70 at any one time, depending on the period. During the reign of Sultan Beyazıd II, there were 70 court jewelers, six foremen and three apprentices. Master craftsmen were much in demand in the sultan's court. What the Ottomans could not find in their own territories, they achieved by conquest. It became customary to recruit skilled craftsmen as soon as a city was occupied, and as the empire expanded, craftsmen were encouraged to travel to the capital to seek new fortunes. During the reign of Süleyman the Magnificent, it was recorded in the palace archives that the sultan had 98 craftsmen in his service: 56 goldsmiths, 22 damasceners, nine engravers and several others.

Gifts and presents flowed into the Treasury almost non-stop from foreign sovereigns and embassies suing for peace and treaties of alliance. In return, sultans ordered their court craftsmen to prepare special gifts to be bestowed in like manner. Perhaps one of the most interesting incidents happened in 1746-47, as the Ottoman sultans were securing their eastern borders. After the 1746 Treaty of Kerden with Nadir Shah, Afghan conqueror of India and recent usurper of the Persian throne, some of the richest gifts the Ottoman Empire had ever offered to a foreign ruler were sent from Istanbul to the shah's court. Some 70 gifts were dispatched, ranging from a golden throne to 90 Turcoman horses. The very day that the gift-bearing envoys crossed the frontier, Nadir Shah was assassinated, and the embassy hurriedly returned to Baghdad with the gifts. Today, some of these presents are on display at the Topkapı Palace Treasury.

The Treasury also holds gifts presented to the sultan on religious occasions and holidays. In 1582, during circumcision festivities for Şehzade Mehmet and other sons of Sultan Murad III, the palace received numerous gifts from merchants and craftsmen's guilds (*lonca*), as well as from foreign ambassadors and envoys.

In the course of history, Ottoman sultans enjoyed great military victories that brought immense quantities of booty from Mamluk Egypt, Safavid Persia, Hungary, Russia, Italy, and elsewhere. How much of the loot found its way to the palace is not precisely known. According to tradition, the sovereign had a right to no more than one-fifth of the spoils of battle, but it is likely that most of that amount slipped beyond the sultan's grasp. Nevertheless, Topkapı Palace still holds a number of rare items won in battle.

Since Topkapı Palace became a museum in 1924, its buildings, gardens and fountains have provided a living environment for the fabulously rich collections of the Ottoman sultans, confirming the palace's unique position among the museums of the world.

Ergun Çağatay also photographed masterpieces of the Topkapı Palace Library for Aramco World.

The Museum of Fine Arts, Houston, will display 85 treasures from Topkapı Palace from April 23 through June 11, 1995.

A golden throne and footstool, enameled and set with pearls, rubies and diamonds, was a gift from an Indian court to the sultan. The enamelwork seems to be from 19th-century Jaipur.

Diamonds decorate the trigger-guard and surround a ruby set in the butt of this flintlock pistol.

This cut-crystal lidded bowl, with a pearl-and-diamond finial, was used by Mihri Shah Sultan, the mother of Sultan Selim III, as a jam-pot.

These golden candlesticks were made for Mehmet (Muhammad) Ali Pasha, Khedive of Egypt under the Ottomans, one of the pioneer westernizers of the Middle East.

Early Ottoman rulers wore simple aigrettes on their turban-pins; elaborately jeweled turban ornaments like this one were a custom adopted from the 16th-century Persian court at Tabriz.

EVENTS & EXHIBITIONS

A ninth-century platter from Kairouan decorated with stylized birds.

The Colors of Tunisia: *25 Centuries of Ceramics* records the infinite variety of humankind's oldest craft. Built or thrown ceramic objects helped provide light, shelter, food and drink, and containers for storage and transportation as civilization took root. The craft reached North Africa between 4400 and 3800 BC. Phoenician, Punic, Roman, Byzantine, African, Arab, Turkish, Italian and French styles all left their marks and combined with native, originally Berber, symbols and forms. Examples of all these ceramics are included in the exhibition, one of more than 15 events that comprise the nine-month "Tunisian Season" this year. Institut du Monde Arabe, **Paris,** through March 26.

Egypt: *The Traditional Dimension.* Designated the 75th anniversary exhibition of The American University in Cairo, this selection of photographs by Mary Cross represents daily life among the country's traditional citizens in Cairo, the Sinai Peninsula, the Nile Valley and the western oases. The Sony Gallery, The American University in **Cairo,** February 6 through 28.

Teaching About the Arab World and Islam is the theme of teacher workshops cosponsored by the Middle East Policy Council in Washington, D.C., and conducted by AWAIR, Arab World And Islamic Resources and School Services of Berkeley, California. Confirmed sites and dates include: **Raleigh, North Carolina,** February 4; **Pasadena, Maryland,** March 15; **Cokeysville, Maryland,** March 16; **Athens, Georgia,** March 18; **Edinborough, Pennsylvania,** March 22; Missouri Western State College, **St. Joseph, Missouri,** March 30; **Walnut Creek, California,** April 1; Tyler Junior College, **Tyler, Texas,** April 8; **Alameda, California,** June 20 through 22; **Columbus, Ohio,** June 27; **Columbus, Ohio,** July 14 and 15. For details, call (202) 296-6767 or (510) 704-0517.

Current Archeology of the Ancient World is a series of talks on current research and discoveries. Among upcoming Middle Eastern or Islamic topics: "Rescue Archeology in the Northern Sinai," D. Valbelle, February 6; "Excavations at Tell Barri in Northwestern Syria," P.E. Pecorella, February 17, Auditorium, Musée du Louvre, **Paris,** 12 noon.

The Emergence of Indonesia: *Photographs by Cas Oorthuys and Charles Breijer, 1947-1949.* On the 50th anniversary of independence, 80 photographs of ordinary people, soldiers and leaders on both sides depict the decolonization of Indonesia. Museum of Ethnology, **Rotterdam,** February 11 through May 28.

Forces of Change: *Artists of the Arab World.* This major exhibition of contemporary works by Arab women artists seeks to de-mystify the region and its women. Featured are 160 artworks by 70 artists from 15 countries. Most exhibitions are accompanied by a series of lectures, films and workshops. Wolfson Galleries, Miami-Dade Community College, **Miami,** through February 25.

Mohammed Omer Khalil, Printmaker and Amir I. M. Nour, Sculptor. Work by two Sudanese artists. National Museum of African Art, **Washington, D.C.,** through February 26.

Orientalists: *An Extended View.* Nineteenth and 20th-century artifacts from the collection of the Nance Museum are shown with prints of a dozen Orientalist artists. Central **Missouri** State University Museum, **Warrensburg,** mid-March through mid-June.

The Art of Islam. Persian manuscripts, miniatures and ceramics stand out in this survey of Islamic art. Works from Mamluk Egypt, Moghul India and Ottoman Turkey are also featured. **Minneapolis [Minnesota]** Institute of Arts, through March 5.

Genghis Khan: *Treasures From Inner Mongolia* represents unprecedented collaboration between the United States and China. The exhibit explores 3500 years of culture and history in a land that produced one of the world's greatest conquerors. **Tennessee** State Museum, **Nashville,** through March 5.

Linear Graces...(and Disgraces): *Drawings from the Courts of Persia, Turkey, and India.* Not all the work of the master artists who found court patronage was intended for the ruler's eyes. This two-part exhibition provides insight into the artists' minds with drawings from the highly finished to the whimsical. Harvard University's Sackler Museum, **Cambridge, Massachusetts,** through March 5 (Part Two only).

A Precious Legacy: *Ceremonial Bridal Costumes from Palestine.* Wedding dresses, headpieces and scarves from the collection of Farah and Hanan Munayyer show each of the major regional styles of weaving and embroidery at its finest. Fuller Museum of Art, **Brockton, Massachusetts,** March 5 through July 2.

Pilgrim of the Pen: *Ghani Alani, Master Calligrapher.* Alani, an Iraqi-born artist living in Paris, has mastered all historical variants in Arabic calligraphy, and also plays a part in new developments in the field. Museum of Ethnology, **Rotterdam,** March 11 through June 11.

From Cyprus to Bactria: *The Seals of the Ancient Near East.* The seals used on objects of transaction were perfected in Mesopotamia, Iran and the Levant, and the study of seals forms a major branch of Middle Eastern archeology. Colloquium at the Musée du Louvre, **Paris,** March 18, 9:30 a.m. to 6:30 p.m.

Orientalism: *Visions of the East in Western Dress* explores, through display of 80 costumes, Western fashion's enduring fascination and repeated assimilation of the ideas and styles of the East, from the 16th century to the latest works of today's top international designers. The Metropolitan Museum of Art, **New York,** through March 19.

Greek Gold: *Jewelry of the Classical World.* Magnificent pieces from the Hermitage, Metropolitan and British Museums are featured in this tribute to the skills of Greek goldsmiths throughout the Mediterranean and Asia Minor from the 5th to 3rd centuries BC. Metropolitan Museum of Art, **New York,** through March 26.

Ancient Nubia: *Egypt's Rival in Africa.* More than 200 artifacts help trace the history of Nubia over a 3500-year period. The exhibition includes statues, inscriptions, vessels and personal adornments. **Rochester [New York]** Museum and Science Center, through April.

Nefertari, Light of Egypt. Exhibit devoted to Queen Nefertari and her era includes artifacts from major museums and a reconstruction of her tomb. Fondazione Memmo, Palazzo Ruspoli, **Rome,** through April 1.

Exhibition '95: *Literature on Islam and the Muslim World.* Book and research displays, workshops, seminars, essay and photographic competitions and a special children's program highlight the five-day exhibit. Athlone Civic Center, **Cape Town, South Africa,** April 13 to 17.

International Conference on Islamic Medicine. Seminars and research on the history, ethics and definitions of Islamic medicine will make up the first such conference to be held in North America. International Institute of Islamic Medicine, **Tampa, Florida,** April 14 through 17. For details, call (813) 661-6161.

The Saudi Aramco Exhibit. Centered on the Arab-Islamic technical heritage, this permanent interactive, "learn-by-doing" scientific exhibit relates the historical background to today's petroleum exploration, production and transportation. **Dhahran, Saudi Arabia.**

Information is correct at press time, but please reconfirm dates and times before traveling. Readers are welcome to submit information for possible inclusion in this listing.

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