Aramco World

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THE LITTLE PEOPLE OF IRELAND

cept when his crock of gold is stolen by mortals. "A leprechaun without a pot of gold is like a rose without perfume, a bird without a wing, or an inside without an outside," James Stephens wrote.

The leprechaun is generally acknowledged to be one of the oldest residents in the Celtic mythological circle, but there is not much documentary evidence to support this. Leprechauns are only rarely mentioned in the early literature of Ireland. *The Ancient Laws of Ireland,* a collection of medieval documents, preserves a story of leprechauns who taught an Irish king how to dive and swim under water — a strange proceeding for gnomes whose natural habitat is not the water but the earth. The earliest account of genuine leprechauns, in an eleventh century manuscript in the British Museum, is entitled "The Tragic Death of Fergus MacLeide." Fergus was a king of Ulster who held a leprechaun king prisoner for five years and managed to survive a whole series of mischiefs perpetrated upon his land by the battalions of little people who tried to rescue their leader. Finally, with the aid of the leprechaun's magical shoes — "brogues of white bronze, of virtue marvelous which travel over land and sea" — he was able to slay a marine monster who had been making his life miserable but in the process incurred fatal wounds.

Like the first two parts of *Gulliver's Travels* — which is also an Irish story and quite probably inspired by stories about leprechauns — "The Tragic Death of Fergus MacLeide" exploits all the comic possibilities that develop out of a contrast between the world of human beings and the world of little people. In scenes which suggest Gulliver's adventures among the Lilliputians, one leprechaun is dropped into a goblet of wine for the amusement of the spectators and then rescued and wiped dry on a table napkin, while another leprechaun is nearly drowned in a bowl of porridge.

In this early contribution to leprechaun history, the leprechauns behave in many respects like the leprechauns of later legend, but they do not repair shoes nor do they guard hidden treasure — obviously later additions to the myth. And yet they are unquestionably the same melancholy little people who gave birth to the tradition that gradually grew up over successive centuries.

In essence their story is based on the tenuous relationship that exists between two worlds — the land of the mortals who must age with years and the land of the fairies who are ageless. To each world is attributed certain obligations and certain rights. The leprechaun has a right to his privacy, the sanctity of his pad and the ownership of his treasure. When these rights are violated, fairy forays into the land of the mortals to claim retribution are inevitable and, in a sense, perfectly ethical. Perhaps it is this sense of right — backed up by the threat of mischief, no doubt — that has preserved and even justified the Irish countryman's superstition. Who is to say that he is wrong? ■

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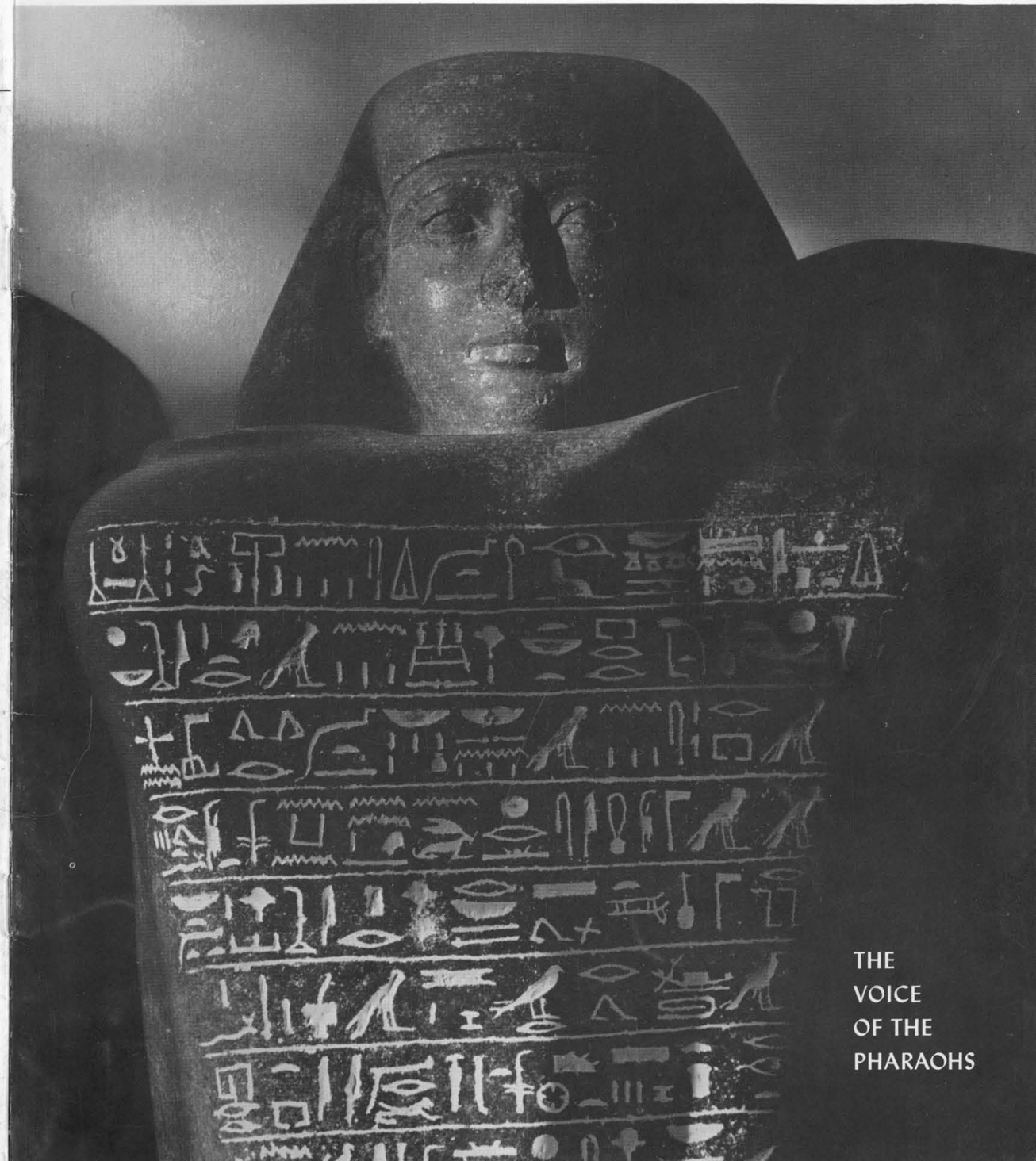

THE VOICE OF THE PHARAOHS

Aramco World

MARCH 1961 VOLUME 12 NO. 3

FRONT COVER: The black granite statue of Yamu-nedjeh from ancient Egypt's Eighteenth Dynasty rests today in the Cairo Museum, where it was photographed by Étienne Sved for **Egyptian Art,** published by Arts, Inc., New York. But about 3,500 years ago Yamu-nedjeh, cross-legged and wrapped in his cloak, sat in a temple at Qurna, Western Thebes, his hieroglyphic inscription invoking the gods Amenre of Karnak and Osiris, "Ruler of Eternity," for a share of the offerings placed in their temples, as well as less material benefits such as the privilege of "leaving and entering the necropolis."

CLOSING IN ON MALARIA 3

The mosquito Anopheles stephensi is evidence that the female of the species is often more dangerous than the male, although in Saudi Arabia's Eastern Province "Steffie" has had her deadly doings brought under control.

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It takes a skilled hand—and patience—to apply the cosmetic make-believe that transforms an actor into somebody else.

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A 3½ foot slab of broken black basalt helped French scholar Champollion put the finishing touches on two decades of effort in cracking the code of the Pharaohs.

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In an effort to answer the why's, how's, and when's of engineers and geologists, the men of Aramco's oil operation laboratories actually create a kind of miniature oil industry inside the lab.

BOOKS ON THE MOVE 16

Since 1905, when they first came into use, bookmobiles have rolled right over such obstacles as low budgets and bad roads, until today these mobile libraries are bringing books and people together in all parts of the country.

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Basically, leprechauns practice a "live and let live" policy, but when they're crossed, they can dip into a bag of mischievous and naughty tricks.

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CLOSING IN ON MALARIA

In the Eastern Province of Saudi Arabia, the malaria-spreading habits of the mosquito Anopheles stephensi have been greatly curtailed by Saudi Arab Government and Aramco medical teamwork.

DR. ROBERT PEFFLY, Aramco entomologist, peered into the microscope and put it into focus. Then he motioned to his visitor.

"Take a look – there she is."

And, there she was – an evil little female who's been causing misery for centuries: a mosquito known as *Anopheles stephensi* – better known as "Steffie."

Because of her, and about 60 other species of anopheline mosquitoes, 1,200,000,000 people in 148 countries live under constant threat of malaria. Every year, on every continent, she leaves millions of her victims weak, listless – and too often dead.

"Malaria," says the World Health Organization, "is man's most expensive disease – the world's greatest single cause of disablement."

To fight it, the World Health Organization last year launched what it calls "the greatest coordinated public health program in the world's history."

But, malaria – and Steffie – have already had their reign of terror smashed in Saudi Arabia's two great eastern

The long but successful fight against malaria began in 1947. Dr. Richard Daggy, now Aramco's medical director, is shown gathering mosquito larvae near Qatif, Saudi Arabia in 1957 when he headed the preventive medicine program.

CLOSING IN ON MALARIA

oases: Qatif and al-Hasa, where more than 300,000 people make their homes.

From 1948 through 1955, the fight was waged jointly by Aramco and the Saudi Arab Government. Since then, the Government has assumed the full burden, with Aramco continuing its annual surveys of infection and carrying on constant research.

Complete eradication has not been achieved, but Steffie has been conquered. It's just a question of how soon she and her relatives surrender unconditionally.

Her conquest is a story of a year-after-year battle of a few men against hordes of insects — a battle that had its successes and its setbacks, its hopeful days and depressing ones. It began in 1947, in the Qatif oasis.

Hidden there was an enemy that had held sway for hundreds of years. Early travelers called it "oasis fever" or "gulf fever" — in many a year, the area's No. 1 killer. Those who dwelled there expected many infants to die each spring and fall; they accepted chronic illness as part of oasis life.

Along came a little group of men: Dr. Richard H. Daggy, now Aramco's medical director and then a young public health practitioner, and a staff of assistants. They wanted to know how many people had malaria, so they went into the towns and villages to find out. Their samplings showed that in village after village, *all* infants were infected; 70 to 98 per cent of all other children examined were infected. (Examination of infants and children is the means by which malaria-infection rate is determined.)

The year 1947 was a bad one in the oases: everywhere an epidemic raged.

"So many were stricken," Dr. Daggy recalls, "that Aramco didn't have enough hospital beds for even its own employees. Beds had to be allocated arbitrarily to those with fevers of 102° or higher. The rest could only be given medication, then returned to their quarters."

Early the next year, the Government accepted Aramco's proposal for a joint program of malaria control. That fall the mosquitoes of Qatif got their first spraying with DDT.

But before the battle started against Steffie, it had to be determined just what kind of creature she was — and the term "she" is used advisedly: only the female mosquito transmits malaria.

Steffie begins as an egg, laid at night. Her birth place is in protected water that isn't too warm or too cool. Considered ideal by her parents is a drainage ditch that's clogged with grass or weeds, affording shelter against sun and larva-eating fish. Other favored breeding places are seepage areas, swamps, temporary ponds and puddles, and shallow wells.

It takes Steffie about eight days to evolve from egg to larva (or "wiggler") to pupa (or "tumbler") to full-fledged mosquito; after that, her life may last a week to a month.

She has her first meal of blood during her first night after emergence from the pupa state. Thereafter, she continues to choose night time for her meals, with the most popular hour being just before midnight. And the gals enjoy getting together after dinner, when as many as 600 engorged females have been discovered clustered on a 15-square-foot wall surface.

This dinner-at-night custom, incidentally, is a boon to malaria fighters. They enter Steffie's hangouts only in *daytime,* when possible. If they must go in at night, they take preventive medicine. An interesting gastronomical note is that man isn't really Steffie's favorite morsel — she much prefers cattle.

She likes to be where it's warm and moist, but not too hot or too moist. Give her a choice, and she'll take it around 90° F., with about 80 per cent relative humidity. Short exposures to temperatures of 104° to 113° can kill her. That's why she spends her days resting indoors, in the palm-thatch and adobe dwellings of the oasis villages. She's fussy, though, about *where* she rests. If the ceiling is too warm, she'll move to or near the floor, or cluster with her friends around "sweating" jugs, or in hidden crevices.

Steffie is as harmless as can be until she meets somebody who has malaria. Only by drawing blood from such a person can she pick up the parasite that causes all the trouble. After that — if she bites someone — ten days to two weeks later, that person becomes sick.

When the spraying teams did their first work in 1948, the results were immediate and dramatic. In the Qatif oasis, the infection rate among infants was slashed from 100 per cent to 44; among all other children, it dropped from 85 to 52 per cent.

"By 1949," Dr. Daggy relates, "the results had become spectacular. For Qatif oasis as a whole, the infection rate had dropped to 14.4 per cent; for infants, to 3.3 per cent."

These great gains were maintained during the next three years. DDT was doing just fine. And, then . . .

In 1953, the number of malaria cases rose for the first time since control began. In 1954, the rate went up again. Making things worse, the man who had been the entomologist had returned to the States. Dr. Daggy had been assigned to administrative work. No one was available to dig out the reasons for the rising malaria rate.

Finally, in October, an important clue showed up. Only a few weeks after the spraying, Steffie began to reappear in treated houses — a striking contrast to 1948, when the spray's effects lasted more than a year. The obvious explanation was that *Steffie had gained the ability to resist DDT.*

Those were bleak days, indeed, for the anti-malaria teams. They thought they had Steffie on the ropes, but now she was making the rounds again. Furthermore, the same DDT resistance was showing up in Greece, Java, Lebanon and the United States.

With prayerful gratitude, the insect fighters saw a ray of hope. During 1954, they'd received some experimental supplies of another insecticide: *dieldrin.*

When Steffie began reappearing that fall in houses that had been sprayed with DDT, *she did not show up in those that had been test-sprayed with dieldrin.*

Optimism was great. Naturally, all during the fall of 1955, spraying was done with dieldrin. And, *down* went the malaria rate. *Down* it went again in 1956 — to about one-eighth what it had been in '54. By 1957, it hit the lowest rate ever. The infant infection rate was down to *zero;* among other age groups in Qatif, just over 6 per cent; in al-Hasa, less than that. Dr. Daggy then reported:

"Malaria transmission had been stopped, for all practical purposes, by the end of 1957."

Surveys in 1958 and 1959 bore him out. *Control* had definitely been achieved, and *eradication* was just around the corner — or so it seemed.

In 1960, the situation remained excellent in al-Hasa. But, in Qatif several malaria cases were reported. Not many, but enough to raise the question: "What's going on?"

Dr. Peffly thinks he may know. Dieldrin is still felling Steffie, but there's another little witch named *fluviatilis.* This species had never been a major trouble maker in the two oases. She still isn't. But, *any* malaria-spreading is too much, and the disturbing part is that Dr. Peffly has proved in his laboratory that *this mosquito sneers at dieldrin.*

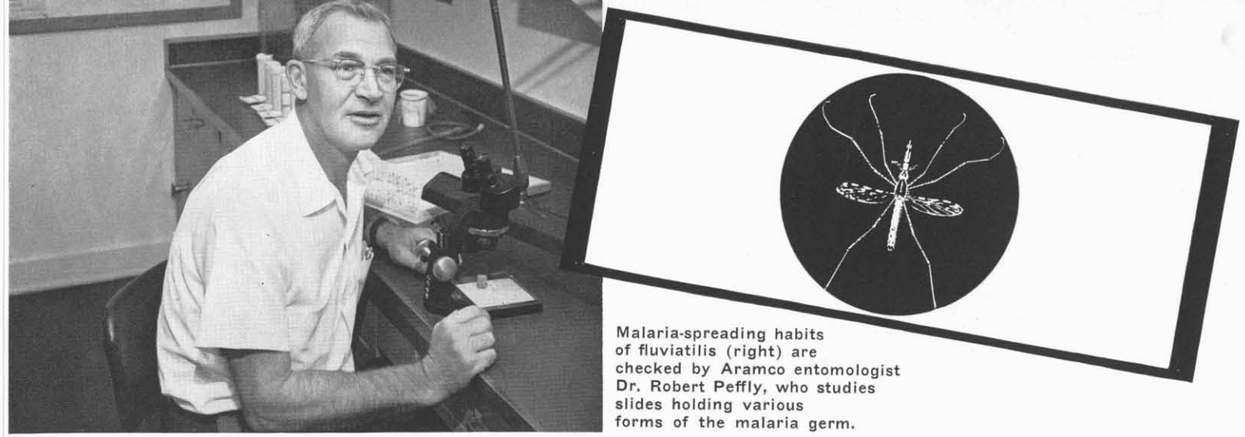
What, then, can be done? The answer is that it isn't necessary to destroy all mosquitoes to stamp out malaria. The parasites usually disappear from the blood of their human hosts after three years. If new infections can be prevented over that period, the transmission cycle can be permanently broken.

As for *fluviatilis:* although she resists the dieldrin that kills Steffie, she *does* yield — so far — to the DDT that Steffie ignores. It's been suggested that a "one-shot" combination of dieldrin and DDT be tried.

Also, there are other weapons: better water control to prevent overflow and seepage; larviciding of major breeding places and filling in of smaller ones; introduction of larva-eating fish; health education. And, new and better drugs for treating malaria are being developed continually.

The Ministry of Health has launched a full-scale push for eradication, in cooperation with the World Health Organization. All oasis villages are to be surveyed so that drugs may be administered to everyone found with malaria.

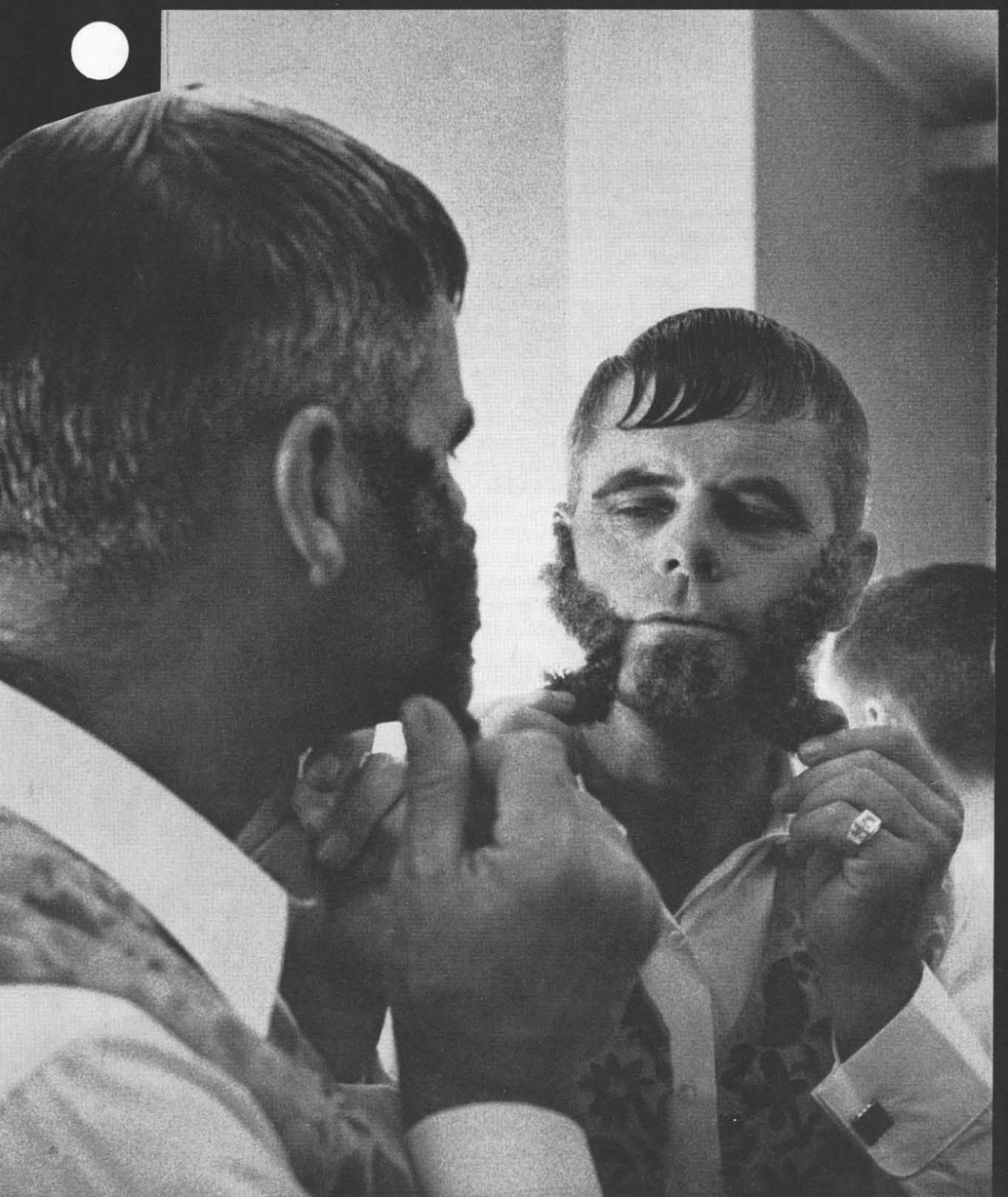
Once the enemy is licked, the job thereafter will be "maintenance." If it works, Steffie and Fluvie and all their relatives will find life pretty frustrating in the oases of Qatif and al-Hasa. ■



Malaria-spreading habits of fluviatilis (right) are checked by Aramco entomologist Dr. Robert Peffly, who studies slides holding various forms of the malaria germ.

Both Steffie and Fluvie like to hide in palm-thatch roofs, but a spray combining DDT and dieldrin hunts them out.

Art of 1000 Faces



When the curtain goes up, there on stage are faces that were created in the dressing room minutes before

THE stage lights dim. An old man, broken and defeated, is near death. His back is bent. We feel the pain in his measured limp and sit forward tensely in the dark. His eyebrows bristle above eyes that are barely more than sockets of dead flame. His craggy nose is moist with tears. Breath by breath his life runs out. The curtain falls.

There is a long span of silence. Then our wonder gathers into waves of applause. In a little while we blink in the sudden brightness of the house lights and straggle out into the night. The face and anguish of a man we did not know three hours earlier is burned into our memory.

Backstage, the "old man" flings off his padded hump and peels away his clay nose, his *crêpe*-hair beard, his grey wig. He sinks his fingers into a huge jar, then laves neck and cheeks, forehead and ears with the smooth, cool cream. With a soft towel he wipes the finger-paint blur of grease and pigment from his face – a face only lightly weathered by thirty-three years. Already friends crowd into his dressing room with congratulations.

The next evening: an hour before curtain time. The dressing room is silent. The actor lays out his sticks of grease paint on the make-up table. He ties a plastic shoulder cover around his neck.

First, the wig. He gums his upper forehead. While the gum dries, he shakes the wig lightly and dresses it with a comb. Then, firmly gripping the back of the band, he pulls it on.

Wilton Lackaye, a master of make-up at the turn of the century, once said: "When an actor comes on properly made up, he has played his prologue."

Now, the beard. The actor gums his chin. A bit of *crêpe* hair just above the jawbone; now some under the jaw. He combs the strands together.

Again, the gum – for the nose this time. He warms some nose paste in his closed palms. A soft, thin layer. Then, with greased fingers, he shapes the broken nose in several light layers. A few strokes with a brush and the nose is covered with a base-color paint.

A mirror acts as critic for Frank Byrd, who applied sideburns and beard for his role in "The Great Western Melodrama," presented by the Aramco Abqaiq Players in Saudi Arabia.

Minutes tick away. The face: first a quick film of grease. On and off! Only the barest coating. Now the grease paint base. No. 5, the right age tint to underlay the deep lines and shadows.

The London* Sporting and Dramatic News in *1875 bowed to the patient art of the man at the dressing-room table: "Cleopatra at her steel mirror, or Beau Brummel arranging the folds of his neckcloth, are less eloquent representations of care and taste . . . than a leading gentleman preparing to face the footlights."

Fingers work slowly, spreading the grease paint evenly to the wig-band, nose and beard. The flesh tones must blend without demarcation into each false part.

The lines in a man's face attest to his life. Out from the corners of his eyes spread crow's feet. Across his forehead, down from the corners of his nostrils, along his throat, lines are graven deeper, year by year.

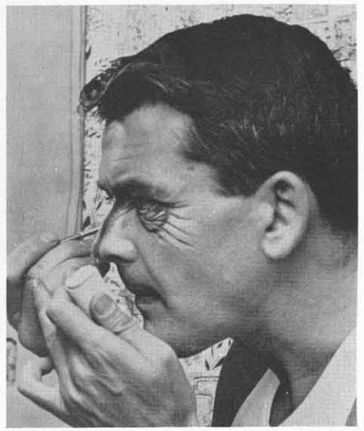
The actor, now intensely involved, pushes the fine point of an orange stick into the blunt end of a stick of grease paint. *Crimson lake* (an old theatre color; more purple than its name suggests). On go the face lines from the tip of the orange stick. Not too heavy. The lights search out every flaw; the front rows see every excess.

Now the sharp tip jabs into some No. 20 grease paint – white. Over each of the old man's lines goes a thin highlight. Not too little. The balcony must *feel* the life buried under these furrows.

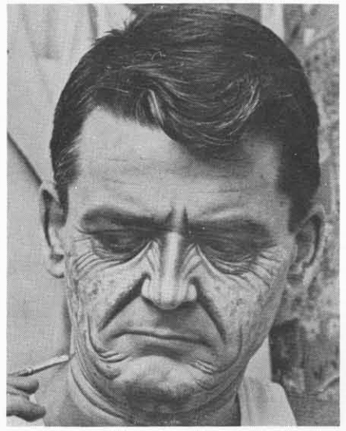
Close or distant? Where is the target? No one knows. One night, making up for* Awake and Sing, *Morris Carnovsky shrugged his shoulders over the question: "Probably the best general rule is to make up for the first ten rows."

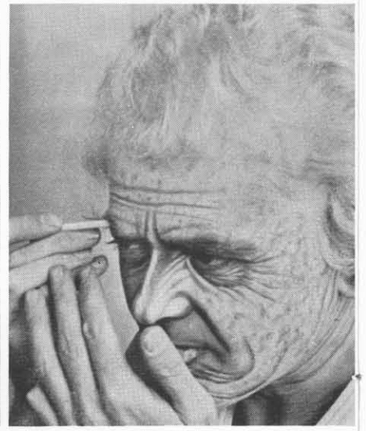
The eyebrows: the actor strokes boldly with a black pencil. His face is hot in the blinding glare of the bulbs that ring the make-up mirror. A touch of *crimson lake* across the break in the nose. Highlight: a subtle thread of white.

White. The tragic mask of Clown. In the last century, death lurked in the lead-based white. George L. Fox, the

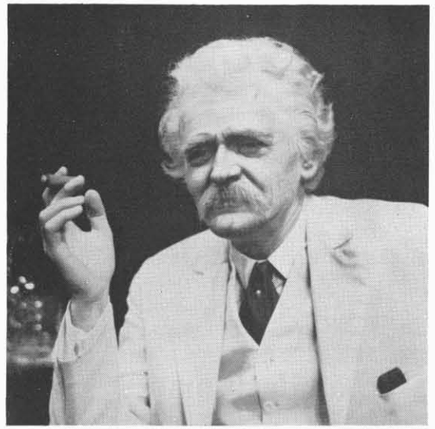


A remarkable transformation occurs when Hal Holbrook, who is 35, makes up to impersonate author-lecturer Mark Twain.





With bold strokes first, then with more subtle touches of grease paint and powder, Holbrook creates stage face that presents illusion of age.



After more than three hours at the make-up table, Holbrook appears as 70-year-old Twain.

ART OF 1000 FACES

finest American clown of his day, died early from the bismuth in the sad face that brought the curve of joy to children's lips.

Age looks back from the actor's mirror. Next, No. 9 grease paint, and a mixed-blue — for shadows to go under the cheekbones.

The focus of intensity sharpens; the "old man" commands the breath and being of the young actor. Above his eyes, on the round upper lid, he works *crimson lake* from the outer edges of the ball toward the center. The eyes recede.

In Russia, custom encouraged actors to become thrilling make-up artists. Audiences applauded the fine make-up created by a master like Michel Chekov of the Moscow Art Theatre.

"First call." A rapid knock on the door. "Thank you." Now the powder; a light sun-tan, barely dusted on with a soft puff, softer than the rabbit's paw once commonly used. Quickly. A dark line between the fingers, around the knuckles, up the back of the hand. "On stage, please . . ."

Once more the magic of make-up, the ancient art of cosmetic make-believe, has created a character whose tale and being will penetrate the deep and guarded emotions of the audience.

Sometimes the art of make-up has been carried to alarming extremes. For example, the Grand Guignol theatres of Paris have long shocked thrill-seekers with realistic torture and murder in a world peopled mainly by the malformed and monstrous.

In the United States, Lon Chaney, Hollywood's "man of a thousand faces," became famous in silent films for his astonishing make-up. His Quasimodo in *The Hunchback of Notre Dame* was a cosmetic masterpiece.

Curiously, the ancient origins of make-up are most evident in the world of grotesquerie. The root of the word "grotesque" is found in the *grotto* theatres of ritual drama, the primitive forebear of Greek theatre. The performers, or *bacchantes* smeared wine dregs on their faces, and The Young Satyr of Greek "old comedy" wore a brown mask for instant identity as an African slave and covered himself with dappled skins.

If grotesquerie, with its roots in prehistory, is one pole of the art of make-up, the other pole is naturalism which rejects all theatrical artifice. At the very moment that French bravura theatre was carrying the still-crude art of face make-up to startling excesses, Eleonora Duse in Italy came forward as Juliet (1873) to start a career based on austere simplicity both in acting style and in her refusal to use make-up.

In contrast, the French actor of that era changed his make-up right in front of the audience by hiding extra make-up in his hands. At the dramatic climax, he would turn away from the audience and pass his hand over his face "in seeming agitation and achieve a transformation." When he again faced the audience, the actor (or actress, of course) was seen to be "hot with shame . . . livid with anger . . . or pale with grief."

Paris and London newspapers in the 1870's exulted over the great art of "Mlle. Croizette and her now famous death scene." In one hand she held a mirror and in the other the colors she required. Just before her final stage agony she would conceal her face from the audience and "quickly compose the expression and complexion of a woman dying from poison."

The Abbey Theatre in Dublin revivified the theatre in the decade following World War I. The opposed views — to make up or not to make up — were brilliantly presented by two leading Abbey players, Barry Fitzgerald and Sara Allgood. Fitzgerald's famous characterizations were reinforced by outstanding make-up. Sara Allgood depended almost entirely upon the authority of her insight and the power of her acting. Her ability to "age" in front of an audience while using little or no make-up was memorable.

When Will Rogers became a famous personality in the *Ziegfeld Follies,* he refused to wear make-up. He stuck to this position in making motion pictures. In one Rogers film the director ordered *all* the actors to play without make-up. But, he announced that he would allow the actresses to wear their usual make-up. "Otherwise," he said, "no one would know them."

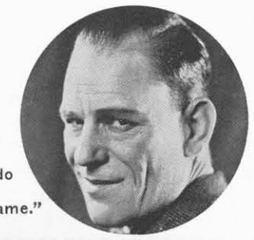
The make-up mirror is tutor and critic. An actor cannot do without it. William Crane, "conceded to be the chief exponent of the art of character," was extremely nearsighted. In 1900, when he played David Harum, a special mirror of great magnifying power had to be made for him so that he could see to make up.

Crane, incidentally, provided a close look at the crudities of the pre-grease-paint era. He once told a reporter: "When I began to act, there was no such thing as grease-paint. We used chalk instead, and for reddening, in place of rouge we used Chinese vermillion. The lines of the face we emphasized with India ink."

Actors started using grease paint regularly in the last decade of the nineteenth century. Lighting had progressed from the smoking torches that Hamlet lit at Elsinore for the strolling players, to gas, to calcium lighting, to electric lighting. In 1904, *Theatre* magazine credited a German actor named Baudin with devising grease paint. "Baudin made face make-up an art," the magazine said. And it might well be added that the probing brilliance of the electric light made it a circumspect art.

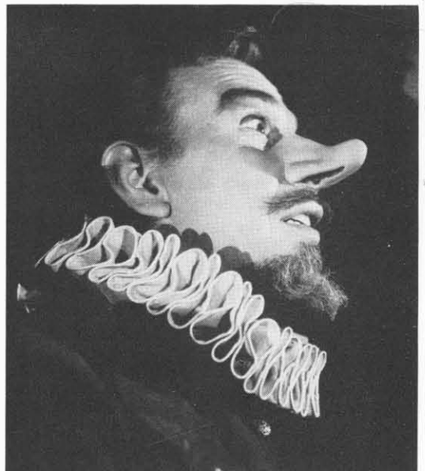
Motion pictures and television have created subtle make-up problems that seem more closely related to the physics and chemistry of light, lenses and film emulsions than to the cosmetic art. Experts have, of course, appeared, but none quite so odd as the Hollywood "fly man." Grease paint is vitamin-rich and contains a sugar. Movie studio flies are aware of this. So, while actors and actresses await the camera call, the "fly man" brushes the insects from their faces, which the performers dare not touch.

Make-up has prospered in the grottos of Dionysian rite, in the rustic dances of Italian city and countryside, in the theatres of Molière and Garrick, and in the drama of the new world. It has stained the anguish of tragedy and given wing to mirth. Today it is involved in a new venture. Office-seekers now have to learn the art of television make-up. The poor pigments, the modest grease, and the aery powder of the theatre dressing room have now entered into the fate of nations. ■



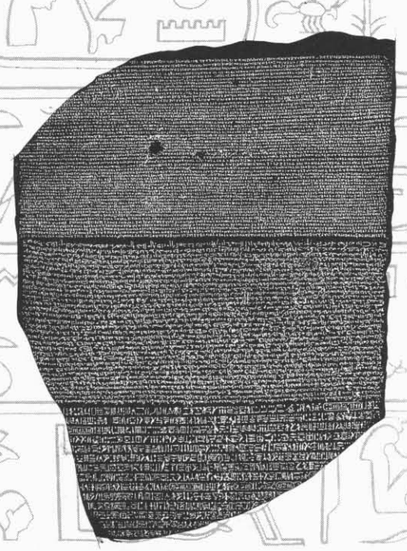
Grotesque make-up helped Lon Chaney create his noted role as Quasimodo in "The Hunchback of Notre Dame."

A beard, mustache and elaborate nose transformed José Ferrer into French poet-soldier Cyrano de Bergerac.



The face — and the mind — of the aging Victoria were captured by Helen Hayes in "Victoria Regina."

Egypt's past was hidden in words no modern man could read, until a Frenchman used a stone slab and 20 years of sleuthing to unlock



THE VOICE OF THE PHARAOHS

JEAN François Champollion walked briskly into the Royal Academy of Inscriptions at ten o'clock on the morning of September 17, 1822. The crisp air of Paris this autumn day intensified his excitement.

A conclave of venerable scholars had gathered in the great chamber to hear about the momentous discovery that the youthful genius from La Dauphiné had made. Jean François appeared even younger than his 32 years in the presence of this elderly assembly.

Monsieur Dacier, secretary of the academy, introduced Champollion with a few words. Then he left him alone at the lectern. Jean François took the top paper from the sheaf he had carried with him. He began to read:

"This is the ninth year. The month is Xandikos, the fourth day. Under the majesty of Horus-Ra, the Pharaoh hath ascended upon the throne of his father, lord of the crown of Upper Egypt and of the crown of Lower Egypt, mighty one of strength . . ."

The old gentlemen listened with fascination. They knew what Champollion had accomplished. He had at last deciphered the hieroglyphics of Egypt. He was reading a translation of the writings on the famous Rosetta Stone, found near the old Arab fort at Rashid on the Rosetta branch of the Nile delta. Here was the key to open the secrets of Egypt's lost past.

Champollion went on. He read about the good works of Ptolemy V Epiphanes. This Pharaoh had presented gifts to his troops, reduced taxes, granted amnesty to prisoners of war and abolished the gangs for the navy. It was all written on the stone. Champollion was putting the breath of life back into ancient Egypt.

A scholar whispered to one of his colleagues: "This is the voice of the Pharaohs speaking again."

So it was. For 15 centuries, the voice of the Pharaohs and their people had been mute. Mute as the Sphinx but infinitely more enigmatic. For 15 centuries, the writings of the ancient Egyptians had taunted linguists and cryptographers. The "sacred carvings" adorning temples and tombs and crowding papyrus rolls had presented an unfathomable riddle in the ages after the demise of the old dynasties. The meanings behind the neatly hewn hawks and hands and unidentifiable symbols had remained one of the mysteries of the centuries.

How the writing of the Nilotic people was deciphered stands as an exciting footnote to history. It is linked with the names of personages no less renowned than Cleopatra and Napoleon. Its main character, however, was Jean François Champollion who had struggled for twenty years to crack the code of the Pharaohs.

The story really begins 5,000 years ago. The oldest samples of Egyptian hieroglyphics date from about 3500 B.C. The first method of writing was straight picture drawing. For example, a Theban merchant sold half a dozen chickens to a traveler from Memphis. He drew six chickens on a papyrus as a record for the tax collector. This rudimentary way of keeping track of business served well for basic needs. But, what about more intricate expression? How would a warrior tell posterity about the conflict with the Ethiopians? How could anyone put down abstract concepts like joy or sorrow?

An alphabet that enables a person to write any thought that comes to mind took centuries to evolve. A move away from the limitations of a purely picture language came when some writer used pictures for whole words. Tousled hair, for instance, would signify grief. A palette and a reed stood for writing; while those two pictures plus one of a man spelled out scribe.

Admittedly better than the first crude writing, this method was cumbersome. It took a good memory to retain the herds of symbols and their combinations. At the zenith of its complexity, the Egyptian script counted more than 600 separate pictures.

The big stride toward establishing a script that represents *sound* rather than *idea* probably started in this fashion: The Egyptian word for "go out" sounded like the word for "house". Why not then sketch a picture of a house to express "go out", a scribe reasoned. So he etched a box with a little door in its side to denote that verb. A modern English equivalent would be drawing an eye to depict the pronoun "I."

Chuckles were surely heard up and down the Nile when this new approach to writing got off to a start. Scribes must have vied with each other to devise clever ways to simplify the unwieldy script. Little by little, an alphabet, close to our definition of one, was developed. The Egyptian word for mouth was *ro*. Some unremembered scribe must have said one day, "Why not use a picture of a mouth to symbolize the sound of 'r'?" The word for owl started with an "m." Thus the scribe utilized a picture of that nocturnal bird to represent the letter "m". He applied this method to all of the consonants so that each one had a hieroglyph of its own. A crane stood for "b", a throne for "k", a hand meant "h" and so on. Combinations of different pictures served as complicated diphthongs. The Egyptian scribes *never wrote* vowels.

An alphabet based on sound permitted the Egyptians to capture the most intangible or abstract ideas in their writing. In time, they introduced a hieratic (priestly) script employed exclusively for sacred carvings on houses of worship and royal sarcophagi. Another script, called demotic, became the everyday handwriting for business and other secular purposes.

Egypt had now given to the world what many consider to be her most precious legacy.

Egypt fell. The banks of the Nile swarmed with Assyrians, then Persians, then Macedonians and then the legions of Rome. The hieroglyphics gave way to alien scripts. Slowly, the once-popular pictures of hawks, hands and thrones slipped beyond the recognition of even the oldest scribes. And who cared? Old Egypt was dead—dead as the Pharaoh Tutankhamen sealed in his golden coffins.

The black basalt Rosetta Stone (inset) provided the key to all hieroglyphics, such as those (left) describing a decree of Ramses I, 1312 B.C., copied in Egypt in 1835 by Champollion's team.

hwd.kꜣ m prꜣ n ḏ.t m rd.t.n nꜣ.i ḥm nꜣ nb.i

I am wealthy in my funerary estate namely that which gave to me the majesty of my lord.

Ancient Egyptian writing, decoded by Champollion (above), had an alphabet that worked much like our own, except the Egyptians used pictures for sounds instead of letters.

THE VOICE OF THE PHARAOHS

The years turned into decades, the decades into centuries. The winds that swept out of the Sahara across the pyramids buried the Pharaohs and their strange way of writing deeper and deeper in eternal oblivion. From time to time scholars and travelers peered at the monuments and stones of old Egypt, but what they saw remained unintelligible. The secret of the hieroglyphs, it seemed, would defy all challengers forever.

But armies other than those of ancient peoples were to overrun Egypt after the passage of centuries. One was a French army. France in the early 1800's was in the grip of revolution and terror, climaxed in the iron rule of Napoleon. From Calais to Cairo, soldiers of Imperial France manned their posts.

Napoleon's short-lived occupation of Egypt kindled intense interest in the lost days of the Pharaohs. Shiploads of papyrus rolls and copies of hieroglyphic markings from obelisks found their way into European centers of learning.

In the tranquil oasis of a French university, Jean François Champollion pondered the exotic script of the Egyptians. He had already mastered the better known languages like Greek and Latin. He possessed a thorough knowledge of Sanskrit, Arabic, Hebrew and at least a dozen more Oriental languages, living and dead. He knew Coptic so well that he kept his diary in that language, the successor tongue to the one the last Pharaohs spoke. The destiny of this Frenchman was clear. He would crack the code of the Pharaohs.

The romantic name of Cleopatra was one of the first two words that Champollion decoded. On an obelisk decorated with the picture carvings, he detected two sets of symbols enclosed in a cartouche (an elongated circle). This same monument also had carved at its base the Greek words for "Cleopatra" and "Ptolemy," surname of the queen-enchantress. The wizard deduced that the word cutters must always have *encircled* royal and divine names in their script. Therefore, he could work on deciphering the letters in the words "Cleopatra" and "Ptolemy." From the symbols in the cartouche, he finally extracted eleven letters. This was an excellent start—but not enough. Imagine trying to read English with a knowledge of less than half of its letters.

Then, in the midst of his laborious work, came a stroke of good fortune. A French soldier on duty as officer of engineers at Rashid, Egypt unearthed a broken black basalt slab, three feet seven inches long, two feet six inches wide and ten inches thick. In its original form, with no parts broken off, the stone must have stood five or six feet high and was probably mounted on a pedestal. Time and sand had done their work, however, and the stone, which came to be known as the Rosetta Stone, was certainly not very impressive at first glance. But close examination revealed that inscribed on it was a long passage in three scripts — 14 lines of hieroglyphics, 32 lines of demotic and 54 lines of Greek characters.

Yes, Greek! Jean François knew Greek as well as he knew his native French. This was the long-awaited chance to unravel the script and explore Egypt's written past.

Champollion translated the Greek tract into Coptic. He began matching sounds, looking for repeated symbols as he had done with the obelisk. Slowly, a pattern emerged. The hieroglyphics were indeed an alphabetic system of writing. (At least, basically.) Now the real labor started!

Twenty years passed before Champollion broke the secret of hieroglyphics. It took him two whole decades to unscramble the symbols with complete accuracy. Why did a linguistic genius need so much time? First, Egyptian script had no punctuation. It was one flow of uninterrupted symbols, some reading right to left, some reading up and down. The script employed no vowels. This meant that the symbols "m" and "n" standing together could be interpreted as "man", "moon", "mean", "mine", or a score of other words. Then too, Egyptian was a flowery language. The scribes and stone cutters never abandoned fully their practice of adding unnecessary and antique symbols that stood for whole words. A single picture, as an example, placed next to a Pharaoh's name might mean the "great" or the "merciful" or something else. It was a challenge that would have defeated a lesser mind than Champollion's.

But, it was worth it all. That morning was the highlight of his life. He spent 25 minutes reading the contents of the Rosetta Stone, reciting the closing passage slowly:

"This decree shall be engraved upon a tablet of hard stone in the writing of the words of the gods and in the writing of books and in the writing of the Greeks . . . and it shall stand by the side of the Ptolemy . . . the beloved of Ptah, the god who appeareth, the lord of benefits."

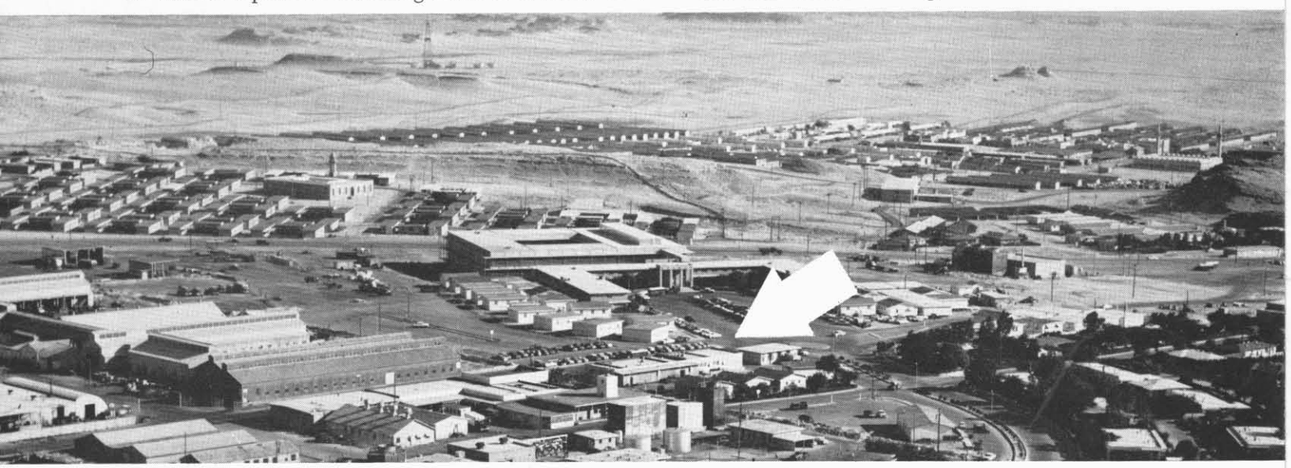
Champollion's voice trailed off into silence. The chamber of distinguished scholars remained quiet. Another task lay ahead: all the words of ancient Egypt were now waiting to be translated. In a way, Champollion's triumph on that September morning 140 years ago was a personal triumph and one that was not to be fully recognized until many years later. Like other pathfinders who have put forth startling discoveries or theories, Champollion had to suffer his share of disbelievers and skeptics. But to him the meaning of his accomplishment was clear – as clear as the meaning of once-strange hieroglyphics. ■

gas) is contained in the porous limestone a mile and a half under a drilling rig at Khursaniyah. Or what proportions of methane, ethane, propane and butane are found in the natural gas separated from crude oil being produced at the giant Ghawar field. Or almost anything else that has to do with current or future oil operations in Saudi Arabia.

And nobody is asking these questions as part of a quiz program. Every answer the lab comes up with means money saved or trouble avoided.

To solve such problems takes equipment much more complicated than a plumber's box of tools. The Dhahran Oil Operations Laboratory has such equipment in its pale-green, one-story structure a block west of King's Road, incongruously close to the mail center, beauty parlor, barber shop and dry-cleaning depot.

A trip through Arnold's bailiwick reveals a fascinating, and often bewildering array of gear, from small mechanical devices of exquisite sensitivity to large pieces of apparatus resembling medieval instruments of torture. In one room, enclosed in a dust-free glass case, there is an analytical balance capable of measuring down to 5/10,000 of a



With the desert next door, Aramco's Oil Operations Lab (arrow) in Dhahran shares a block with the mail center, the dry-cleaning depot and a barber and beauty shop.

gram, or about the weight of a couple of grains of common table salt. In another room is testing equipment that can exert hydraulic pressures up to 10,000 pounds per square inch, so as to test safety valves and other equipment used in controlling the flow of high-pressure gases from deep underground. Of course, there is the usual paraphernalia for making chemical analyses — test tubes, glass pipettes, beakers and flasks, Bunsen burners—besides more exotic items such as the flame spectrophotometer, porosimeter and chromatograph.

The Dhahran establishment is one of three full-scale laboratories. The lab at Ras Tanura has the most workers and runs the most tests. There, Chief Chemist Harry Harrity, a transplanted San Franciscoan, and his staff of over 100 worry about quality control and quality testing of products coming out of the refinery and headed for offshore shipment. A round-the-clock check of petroleum products manufactured at the Ras Tanura Refinery is made at four points, beginning at the refinery streams and ending at the storage tanks.

Since Abqaiq is the center of Aramco's drilling and oil producing activities, much of the work done in its laboratory, which is supervised by a New Yorker named Clement Louis Marino, is aimed at making oil-well drilling more efficient. The Abqaiq laboratory, for example, keeps a continual check on the "mud" that is indispensable for drilling a well. This substance is basically a gel-like clay called bentonite, with chemicals and water added to meet certain rigid specifications. It is pumped to the bottom of a hole through a hollow drill pipe and back up again outside the pipe but inside the hole wall. In the course of this journey the mud performs several vital chores. It cools the drilling bit. It lifts bit cuttings to the surface. And, on the way up, it coats the walls of the hole with a "mud cake" — much like the mud pack in a facial treatment — which helps prevent the loss of the drilling fluid into porous rock layers.

Aramco's drillers cannot gamble on whether or not the mud they are using has all the physical and chemical properties to do these jobs well. They have to know for sure. They ask the laboratory in Abqaiq to test the drilling fluid for viscosity, since mud that flows too rapidly may be just as improper as mud that is too sluggish. They have mud samples tested also for other characteristics, such as density, before the mud itself is certified for its round trips from slush pump on the drilling platform to the bottom of the hole and back again.

Whereas the Ras Tanura and Abqaiq laboratories run specialized tests for their more or less immediate areas, the laboratory in Dhahran backs up Aramco's Arabia-wide research in oil operations. Its projects are apt to be longer range, such as the continuing investigation to determine the salinity of Saudi Arabian crude oil and refined products.

Much crude oil contains different amounts of inorganic salts, which are harmless until the big increases in temperature and pressure at the refinery or stabilizer convert the salts to highly corrosive acids. To minimize the corrosion of processing equipment, oilmen must know how much salt is contained in the oil being handled. A quick method of determining this salinity was developed in the Oil Operations Laboratory by Kenneth G. Stoffer. This method uses an instrument with a very dramatic name — a flame spectrophotometer.

This instrument works on the principle that every metal gives off light in certain known wave lengths when it is heated to incandescence. The metallic element being measured in this case is the sodium in the sodium chloride — or salt. A sample of petroleum diluted with benzene is injected into an extremely hot tip of flame. The light from the flame is separated into colors by a prism inside the spectrophotometer, and any color but the one known to be given off by the presence of the incandescent sodium is barred. Laboratory engineers can then measure the amount of salt in the test sample of petroleum by converting the light beam into electric impulses.

One whole wall of a long room in the back of the Oil Operations Laboratory is stacked with shelves which hold hundreds of deep, narrow trays. Inside each tray are carefully labeled samples of rock material such as limestone, sandstone or shale. These core samples, cylindrical in shape, have been cut by oil well drillers from strata a mile and a half or more under the ground.

Oilmen go to much trouble to bring core samples to the surface because the cores tell a clear story about the conditions, petroleum-wise, deep in the earth. A single core can give a vital clue to the presence of oil beneath a drilling rig. Careful studies of many cores, taken from widely separated points, can provide extremely useful clues to the size of an oil field and the quantity of crude oil it holds.

A geologist can look at a core sample and tell what kind of rock formation it comes from and, if the core is black and sticky, that there is oil inside. But it is the Dhahran Oil Operations Laboratory that really unlocks the secrets inside the core and reads it like an open book. The core sample must be subjected to several elaborate physical tests before reservoir engineers can know such highly technical things as its porosity, permeability, wettability and resistivity. And these tests are conducted by the Routine Core Analysis Unit, whose supervisor, Tony L. Delay, hails from Spokane, Washington.

Oil is not found, of course, in underground lakes, rivers or other "pools," but exists in certain porous sands, sandstones and limestones. These rocks were formed ages ago by sedimentary deposits and chemical action. It is of vital importance for reservoir engineers to know, for example, the porosity, or ability to contain certain fluids or gases in the pores, of each underground formation being tested for oil. Delicate apparatus is used to find the ratio of the void volume to the total or bulk volume of any material — in this case the ratio of the combined volume of all the pores in a core sample to its total bulk.

One such device, logically called a porosimeter, holds a plug of the core clamped into a small air-tight vault which is then "charged" by nitrogen gas under pressure. The porosimeter operates on a historic law of physics, set down four centuries ago by Robert Boyle, which states that the volume of a gas varies inversely with the pressure. By measuring the volume of gas which a core can absorb at a given pressure, the porosimeter determines the volume of the pore spaces.

Another section of the Oil Operations Laboratory examines the fluid properties of oil and gas as they exist in the Saudi Arabian oil fields. In nearly all the underground reservoirs in Saudi Arabia, the oil has been found to be undersaturated; that is, all of the normally gaseous components are completely dissolved in the oil, and even more gas could be dissolved if it were present. The gas-oil solution is held in the reservoir under high pressure exerted by water in the surrounding rocks. When the reservoir is pierced by a well, the oil is forced up the well by the reservoir pressure and by the force exerted on it by its own dissolved gases.

As the fluid flows up the well under all this pressure, the pressure is reduced sufficiently to allow gas to start bubbling out of the oil, much as gas bubbles from a freshly opened bottle of soda. Technicians in the PVT (for Pressure-Volume-Temperature) Unit are able to recreate, with laboratory testing equipment, various conditions similar to those down in the oil reservoir. These tests provide data on such physical characteristics as the bubble point, viscosity and gas-oil ratio of a sample of reservoir fluid.

Why is such information so significant to Aramco? One typical reason is that this test data helps the engineers to plan the size of the flowlines which deliver the oil from the well to a gas-oil separator plant (GOSP), where dissolved gas must be removed from crude oil before that oil can be loaded in tankers or sent to the refinery for processing. This test data also has been used in the design of the fifteen widely spaced GOSP's which Aramco has built on the surface of its producing fields.

After the gas has been separated from the oil, the petroleum engineers need to know its heat value, or how much heat is given off when the gas is burned as fuel in Aramco's own operations or by other industries. One way of finding out is to break down a sample of gas into its various gaseous hydrocarbons. The apparatus used to do this is called a chromatograph, and it looks like a radio ham's transmitter panel that has been put together by a chemist.

A small sample of the gas to be analyzed is introduced into the chromatograph and is carried through a special column by a stream of helium gas. In the column is an inert granular substance coated with a complex organic chemical, which absorbs the gas sample and then releases the hydrocarbons one by one, so that they arrive separately at the column outlet. The concentration of each hydrocarbon is measured electrically and recorded automatically by a pen which inks a line on a moving chart. The quantity of each component is determined from the chart, and then the composition of the gas sample is calculated.

In other words, as Tom Arnold was saying: "Our lab does service work. We duplicate in miniature every kind of oil operation the company engages in." ■

The treasures held by the bookmobile bring everyone on the run.

Books on the Move

A librarian in rural Indiana stopped her bookmobile at a lonely crossroads. One of her first customers was a little blond girl of eight or nine who hurried to the fiction shelf where books are arranged alphabetically by authors' names, searched a moment and confidently made her choice. It was this same little girl that the librarian had noticed taking home such heavy volumes as Jane Austen's *Pride and Prejudice,* Emily Brontë's *Wuthering Heights* and Charles Dickens' *Bleak House.* This time the book was James Joyce's *Ulysses.*

"Isn't that a rather difficult book for you, Peggy?" the librarian asked.

"Oh, I'm reading *all* the books," Peggy explained matter-of-factly. "I've read as far as 'J' now, and I don't want to miss any."

Peggy and thousands more like her are typical of a nation where the library is likely to be one of the most popular spots in town. But in many parts of the country, libraries are few and far between. People are hungry for books, but often the nearest library is out of reach. The answer, for a "nation on wheels" as we've often enough been called, was to put wheels under the library.

Actually, books have always been on the move. In the early West there were itinerant bookmen who hawked wagonloads of reading material to settlers. Abraham Lincoln educated himself and made his great career possible by walking miles as a boy to borrow books. A librarian in Butte County, California many years ago recorded in her diary the trips she made on horseback to isolated homes with her saddlebags crammed full of books.

The notion of sending a library collection into the countryside on scheduled rounds was originated in 1905 by Mary Titcomb, a dedicated librarian at the Washington County Free Library in Hagerstown, Maryland. She outfitted a wagon with a large black box, its hinged sides protecting shelves of books. Civil War veteran Josh Billings was hired to drive a pair of black horses that pulled the "book wagon" over sixteen routes, combing a 500-square-mile area. In 1910 the outfit met an untimely end when it was demolished by a freight train, but in 1912 a second book wagon, this time a truck, resumed the service.

Since then the bookmobile has come of age. Today's vehicles ply both rural roads and suburban streets from one end of the continent to the other, carrying history, science, adventure, philosophy, mystery and how-to-do-it advice to people in all walks of life. The latest models are brightly-painted vans that carry up to 3500 volumes — as many as can be found on the shelves of some village

Books seem to take on an added value when they come from the shelves of a traveling library

libraries. Some of them have loudspeakers on top to announce their comings and goings. A hidden generator provides power for lights, heat and sometimes even air conditioning. The librarian checks out books from a small desk at the rear door while a clerk-driver receives books being returned at the entrance in front.

Because of low budgets or road conditions, some areas are served not by huge, modern vans but by converted trucks or school buses, panel trucks or even station wagons. The first bookmobile to enter service in the state of Nevada was a converted war-surplus ambulance. But, whether people must stand in the cold to make their selections from outside shelves or a tailgate, or whether they browse inside amid custom-built comforts, their reactions never vary: They're glad to get books.

Even the smallest of bookmobiles, with only two or three hundred volumes on board, offers complete service. The entire collection of the parent library is at the disposal of bookmobile patrons, including phonograph records, film strips and pamphlets. Through inter-library loan, resources all the way up to the Library of Congress are on tap. Freckle-faced youngsters often ask for books on keeping snakes, lizards or other unusual pets. A New England mobile library once delivered a book on pretzel-making and another on early Greek music at the same stop.

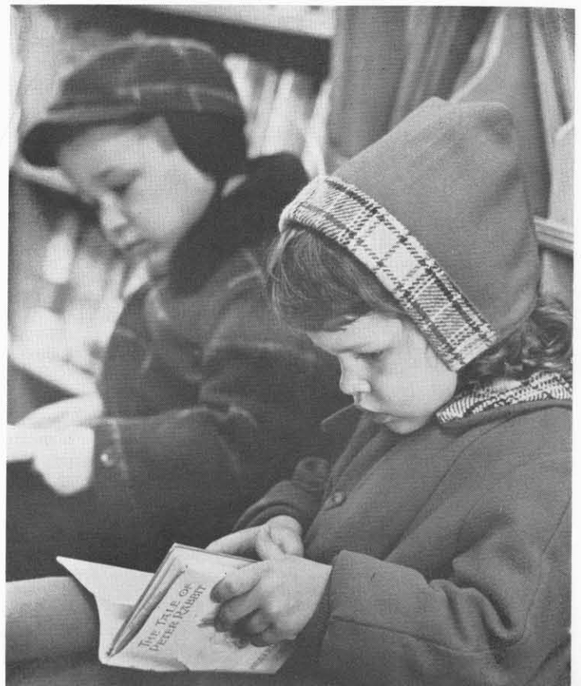
The librarian — usually a woman — may have to know how to drive a truck as well as give advice on books and answer reference questions. (Only larger bookmobiles carry a staff of two or three.) On more than one occasion a petite lady has wrestled a truck through snow or mud, perhaps changed a flat tire. And if she wondered whether it was worth it, when the next stop was reached and she saw the mixture of relief and joy on the waiting faces of people who had feared there would be no books that day — well, then she knew it was worth it.

The mobile library becomes a vital ingredient in the lives of many people, and their disappointment is profound if they miss its scheduled arrival. A vehicle that circulates in vast northern Montana was just pulling out of Yaak one day when the shouts of a boy galloping up on a pony drew it to a halt. Nearly in tears, the lad asked the driver to wait for his mother. Almost at the end of their ten-mile ride, their gunny sack of books had slipped from the mother's saddle, strewing books over the ground. The bookmobile would not return for six weeks, and the boy's concern was about exchanging a well-thumbed copy of *The Prince and the Pauper* for a copy of *Huckleberry Finn.*

Books seem to take on an added value when they come out to meet the borrower, but the bookmobile is popular for more than its stock of reading material. It often serves as a social center for housewives who would otherwise have no common gathering place. They chat as they browse, or some come to chat without borrowing any books. If they haven't already met for coffee at the house nearest the stop (in which case coffee may be taken to the bookmobile staff), they go off for coffee together when they've got their week's or two weeks' supply of best-sellers, cook books or whatever. A woman in a Chicago suburb, shy and new to the neighborhood, began to visit such a bookmobile, but over a period of several months she made her selections quietly and returned home. When she failed to appear one day, others inquired about her, then took a book the librarian was holding for her and found her at home, sick in bed. The newcomer became one of the best-liked women in the block — and an ardent supporter of the library.

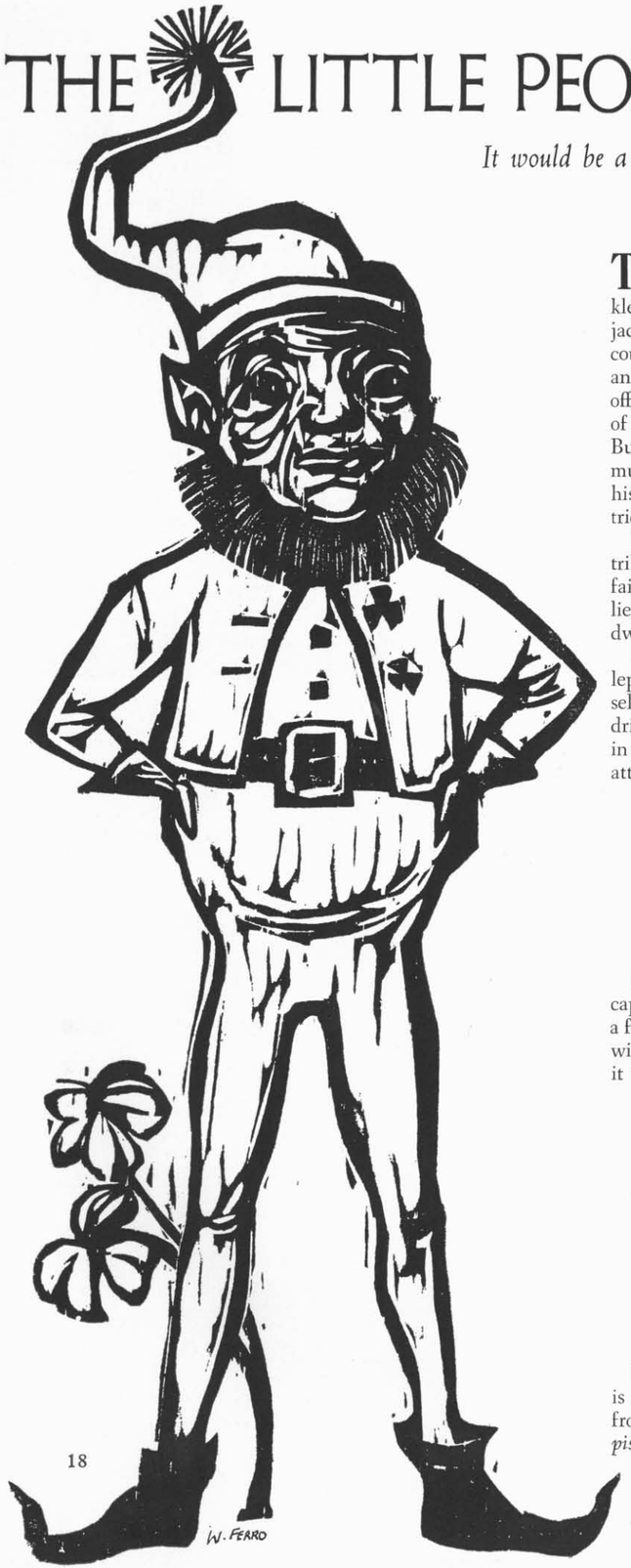
Bookmobiles may be seen within the boundaries of the nation's largest cities as well as in rural and suburban areas. They not only supply service to outlying neighborhoods but also serve to help officials determine the sites of future branches. Los Angeles and Chicago have four traveling libraries; St. Louis, three; and New Orleans, two. Of New York City's nine bookmobiles, one operates in the populous, skyscraper-filled borough of Manhattan, not plying a route as the others do but serving as a substitute for branch libraries when they are closed for renovation. Books were put on wheels in New York City as far back as 1922. A library trustee, touring Staten Island with a librarian, noted that many areas were far removed from branch libraries. He pondered a moment, then remarked, "You need a Ford." A moment later he added, "I'll give you one."

The number of bookmobiles on the nation's roads has grown from 600 in 1953 to more than 1,000 today, and they are being added gradually in all parts of the country. They serve as a practical symbol of the modern concept of librarianship: serving *all* the people in the best way possible. That means bringing books and people together, even if the books have to go half way. ■



Like older folks, young patrons find the shelves of the bookmobile fascinating.

THE LITTLE PEOPLE OF IRELAND



It would be a reckless act to transgress on a leprechaun's basic rights, but if you do – look out!

THE leprechaun looks like a miniature human being. Never more than eighteen inches high, he has a wrinkled face and a melancholy disposition, wears a green jacket and a red cap – red is the color of magic in all countries – and spends most of his time mending shoes and guarding a hidden treasure. When somebody makes off with his loot – a not uncommon calamity in the life of an average leprechaun – he leaves his last in a hurry. But he generally retrieves his pot of gold with nobody much the worse off, for the leprechaun's only weapon is his intriguing capacity for mischief. He is essentially a trick-or-treat artist.

Thus might be described the leprechaun, Ireland's contribution to the international gallery of fairies. Although fairylore differs considerably from country to country, belief in the existence of "little people" – whether elves, dwarfs, brownies or leprechauns – seems universal.

For any injustice done to the little people of Ireland, leprechauns have a whole list of tricks to avenge themselves. They are capable of souring the milk, befouling the drinking water, snipping off the heads of the corn growing in the field, stealing the family butter or launching an attack of rheumatism, aching teeth or pinching shoes.

By the craggy hill-side
Through the mosses bare,
They have planted thorn-trees
For pleasure here and there.
Is any man so daring
As dig one up in spite,
He shall find their sharpest thorns
In his bed at night.

Under extreme provocation, however, the leprechaun is capable of making off with a child. But he frequently leaves a fairy child or changeling in its place, treats the stolen child with kindness and can generally be talked into restoring it to its rightful parents.

They stole little Bridget
For seven years long;
When she came down again
Her friends were all gone.
They took her lightly back,
Between the night and morrow.
They thought that she was fast asleep
But she was dead with sorrow.
They have kept her ever since
Deep within the lakes,
On a bed of flag-leaves,
Watching till she wakes.

In any struggle with leprechauns the ordinary mortal is not necessarily helpless. The Irish countryman learns from childhood an impressive number of spells, called *pishrogues,* which enable him either to minimize or avoid the tricks of the leprechauns. Many superstitions and customs explainable only in terms of the constant threat of fairy wrath survive even today in Ireland. In some areas, for instance, a farmer never builds his gate posts with conical tops but leaves them flat-topped so that the fairies will have a surface to dance on. In other parts of Ireland no farmer builds a house or barn without first sticking a spade into the ground and leaving it there over night. If the leprechauns have not removed it by the next morning, he can assume that the building site has their approval. The bad luck that can ensue from building a house across a fairy pad is the theme of countless stories, and no intelligent, leprechaun-fearing person would dare tamper with a fairy mound.

Leprechauns do not live below trees as is sometimes inaccurately said of them. The Irish countryside is dotted with countless mounds of earth and circular-shaped earthen enclosures called *raths.* Archaeologists claim that these *raths* are actually the tombs or dwelling sites of prehistoric people. But the country folk have a more vivid imagination than the archaeologist, and they feel that they know otherwise. The *raths* are the dwelling place not of prehistoric but of contemporary residents – fairies.

The scientist may smile patronizingly at such superstition, but at the same time he is grateful for it. Because of the fact that no farmer would dream of running his plow through a fairy mound for fear of the terrible anger of the little people who live in it, the *raths* of Ireland have remained undisturbed over the centuries. The archaeologist can only be pleased that so much of the prehistoric past remains for him to sink his scientific shovel into.

Such are the basic facts about the life and times of the leprechaun. For many people they are real enough, and for those others whose lives are more likely to be influenced by science than by fairylore, let them raise a more quizzical eyebrow. But detachment is not everything, and the skeptical inquirer will have his hands full trying to throw additional light on the mystery of the Irish leprechaun.

In the first place, there is considerable uncertainty about the leprechaun's name, since it is actually spelled and pronounced differently in different localities of Ireland. In Kilkenny, for instance, he is a *lurachan,* but in Kildare a *lurikeen,* while in West Cork he is a *chlurichan.* In fact, it is only the west of Ireland that calls him a leprechaun (Gaelic – *lupracán*), which happens to be the form of the word which came into the English language in 1604.

There is equal uncertainty about what the leprechaun's name means. One etymological explanation is that it means *tiny body,* another that it means *one shoe* – the leprechaun presumably repairs one shoe at a time. There is also a theory – not very popular in Ireland – that the word came into Ireland from England and is related to *lubberkin,* a small lubberly fellow.

But whatever problems of orthography and nomenclature the leprechaun may present, there is no problem in classifying him. Fairies are always divided into four classes – gnomes, sylphs, salamanders and undines – and are identified respectively with earth, air, fire and water. All four are tiny and universal, but since only those in the gnome group are covetous and melancholy, it is easy to see which group the leprechaun belongs to.

Of course, all Irish fairies, whether sprites or not, have specialized functions. The *pooka,* for instance, is a water sprite and quite obviously an undine, although it might be argued that he isn't really Irish at all since his name came from the Norse and he is probably a distant relative of Shakespeare's Puck. The *banshee,* on the other hand, who is a distinctly Irish creation like the leprechaun, is not a sprite but a normal-sized female fairy. Her job is to comb her hair and cry outside a house where somebody is about to die. The funeral cry of countryfolk, known as keening, is supposed to be an imitation of the banshee's wailing. But of all Irish fairies the leprechaun seems to be the only one of the lot who is constructively employed, ex-

The Leprechaun's Relatives

Even though they exist in a world that is populated primarily by normal-sized humans, the little people of Ireland have no reason to feel lonely. Leprechauns have plenty of relatives who are not much bigger and sometimes smaller.

Like the leprechaun, these relatives live, work and play in all the secret places—caves on hillsides, secluded woodland glens, hidden ponds. Often they dwell in the perpetual twilight of towering, primal forests. In fact, so secretive are most of the little people in their abodes that it's hard to escape the conclusion that they much prefer their own company and want as little traffic with humans as possible. But despite the little people's ability to steer clear of us, we humans have managed to learn a lot about them, especially through the folklore of many a nation.

While the leprechaun makes it a point to avoid humans unless he feels that he has a legitimate gripe against them, the leprechaun's cousin, the **fairy,** often intervenes in human affairs to do a good turn, and it must be admitted that most fairies are better looking than leprechauns. Another cousin who is more likely to be helpful than mischievous is the **elf.** He has the distinction of being the most frail of the wee ones, and his females are said to be the most attractive of all the little people. The **brownie** has the best disposition of all. He's always good-natured, despite the fact that he works late hours, for it is after midnight when he comes out of hiding to perform his helpful services.

The leprechaun, being of a chronic melancholy disposition, perhaps feels more at home with the other side of his family—the mischievous, sometimes grouchy, all too often downright mean side. Most **gnomes,** for example, are not very cheerful fellows. They are often the guardians of mines or quarries and have the ability to move through earth like a fish through water. The **gremlin** is a foot-tall creature whose impish behavior is responsible for the malfunction of machinery or, in some cases, its strange disappearance. **Trolls** are never kindly disposed towards humans and should be avoided whenever possible, especially when they appear as giants instead of small fellows. Trolls seem to prefer northern climates, such as in the Scandinavian countries, and feel at home in damp caves or under bridges. Although an occasional **goblin** is playful, most are malicious or evil. Goblins are extremely unattractive little people, and that perhaps explains their nasty dispositions.