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

THE FLOWERS TALK

grance increases and burning acid is distilled from the calyx. But the victim is unconscious and passes unhurt into death through splendid dreams, giving up his body to the plant for food.

Equally fearful is the kerzra flower of Persia. Should you but breathe the air which has passed over it, you will die!

Dieffenbachia — the green-leaved plant so often used decoratively in our modern buildings and homes, was known in tropical South America as "dumb cane," the plant whose juices could paralyze the vocal chords of shrewish wives.

Why do we attribute human qualities to specific flowers? Why the *bashful* peony, *friendly* ivy? Physical appearance accounts for only a few. The language and hidden meanings ascribed to most flowers have evolved from centuries of folklore. Ever since Cupid spilled nectar on its petals at a feast of the gods, to give it its alluring fragrance, the rose has been a symbol of love. The narcissus has extended a Roman legend into a branch of modern psychiatry. And Shakespeare's Ophelia remarks in Hamlet:

"There's rosemary, that's for remembrance; pray, love, remember: and there is pansies, that's for thoughts."

Today's teen-ager who wears one sock up and the other down to show she is still "looking" for a steady beau, is only expressing in a new way a language that in Victorian times found its apotheosis in flowers. A young man at the turn of the century who sent his love a bouquet of rosemary, chickweed and *Franciscea Latifolia* was clearly saying: "Remember our rendezvous, but beware of a false friend." Each plant had a well-established meaning. Single flowers were simple statements: red tulips — a declaration of love. Jonquils asked return of affection. Lady's slipper reminded the lady, "You're a coquette." Larkspur said, "You're fickle."

We are still using floral symbols to speak without words. As recently as the last War, Queen Wilhelmina of Holland wore a silver reproduction of the field daisy during her exile. Its significant message: hope, courage, prophecy.

Perhaps the language of flowers may help to make the world one again. Interflora, an organization which arranges for the exchange of flowers across international boundaries, has over 100 countries participating. Says Maurice Debrie, one of the French members: "The language of flowers is truly a universal medium which translates the wishes for joy, for love and for sympathy into every tongue." ■

ARAMCO WORLD

JUNE-JULY 1960

Aramco World

JUNE-JULY 1960 VOLUME 11 NO. 6

FRONT COVER: After dropping out of sight for a long time, sundials are returning once again to grace many a suburban garden. They bring to this complex age a touch of refreshing simplicity. A story about them starts on Page 6.

PICTURE CREDITS: Front Cover, page 7—Aramco photos by Carl von Hoffman. Page 3—Aramco photo by Owen Oxley. Page 4—Aramco photos. Page 5—Aramco photos by Khalil Nasr. Pages 7 (top and center right), 14 (lower left), 21 (lower), 22 (center, right), 23 (center)—Bettmann Archive. Pages 8, 9 (left)—Fred H. Stocking. Pages 9 (top right), 11, 12—A. Devaney, Inc. Page 9 (center right)—Tiffany and Co.; (lower right)— Maury Garber for Rockefeller Center, Inc. Pages 14 (top), 15 (lower)—United Press International. Pages 14 (right), 21 (top), 22 (left), 23 (left and right)—Culver Service. Pages 15 (top), 19 (lower)—Aramco photos by T. F. Walters. Pages 16, 17—Aramco photos. Pages 18, 19 (top)—Aramco photos by E. E. Seal. Pages 22 (lower)—Ewing Galloway. Page 24—A. Acciani.

A publication of the Arabian American Oil Company — A Corporation — 505 Park Avenue, New York 22, N. Y.
T. C. Barger, President; J. H. McDonald, Vice President and Secretary; E. G. Voss, Treasurer
Editor — Leonard Turk

Manifold valves at shore control station of Tapline's terminal at Sidon, Lebanon.

BARREL X TAKES A TRIP

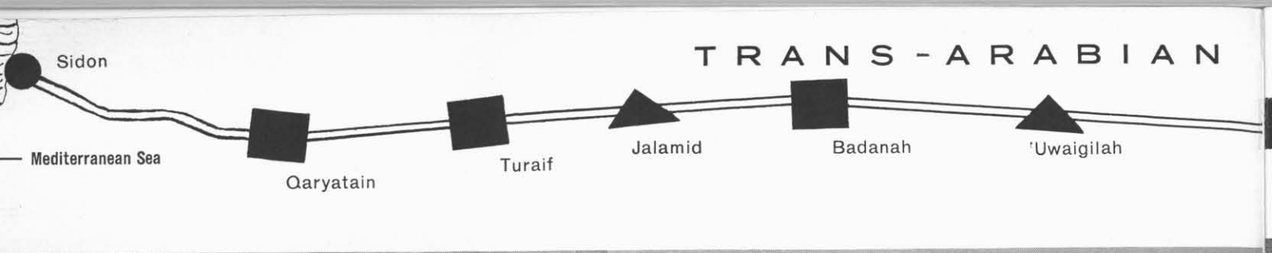
A barrel of Arabian oil goes on an 11-day, 1000-mile pipeline trip to the Mediterranean

LET'S call it Barrel X — 42 gallons of crude oil from a well at Abqaiq in the Eastern Province of Saudi Arabia near the Persian Gulf. Over a thousand miles to the west, a 200,000-barrel tanker rides at anchor in the port of Sidon, Lebanon, on the Mediterranean Sea. Barrel X is ready for market; the tanker is waiting for a cargo. The problem is to get them together — economically, efficiently and fast.

The question is *how?*

The Trans-Arabian Pipe Line Company found an answer ten years ago: A 30-31-inch pipeline linking the Mediterranean with the heart of the Arabian desert. For 750 miles, it snakes across Lebanon, Syria, Jordan, and Saudi Arabia; then it hooks up at Qaisumah with 300 miles of line that "gathers" crude oil from the various Arabian American Oil Company fields in eastern Saudi Arabia and forms one of the largest crude oil pipeline systems in the world.

Suppose we follow one barrel — Barrel X — on its 11-day trip through the maze of pipes, pumps and tanks from the



Residential housing at Turaif Pump Station.

Portable Pumping Unit at Shu'bah.

BARREL X TAKES A TRIP

producing fields in the east to that tanker berthed off the coast of Lebanon, 1,000 miles away.

Barrel X is brought up from a well, 7,500 feet deep, and then travels for about three days through Aramco's gathering pipelines to Qaisumah where the amount of oil that moves through the pipeline is measured and made ready for an eight-day trip to the sea. So far, most of the trip has been underground. Much of the eastern section of the pipeline was "ditched," for it passes through an area of shifting sand dunes which constantly pile up under the buffeting of fiery winds from the north. In the northwestern part of Arabia, with its rocky plains, much of the line was constructed above ground.

Qaisumah is the first of four pump station communities – Qaisumah, Rafha, Badanah and Turaif – which apply pressure to Barrel X to keep it moving westward. An additional boost is given the oil by remote controlled pumps located to the east of each big pump station. Together, these stations and radio operated Auxiliary Pumping Units (APU's, as they are called), act like men in a bucket brigade, passing Barrel X along from one hand to another. Tapline normally transports about one-third of the crude oil produced by the Arabian American Oil Company in Saudi Arabia. The daily capacity of the pipeline is 470,000 barrels. Throughput (the number of barrels pushed through the line) last year averaged 337,985 barrels a day.

As Barrel X leaves Qaisumah and approaches Shu'bah, the first Auxiliary Pumping Unit, the pipeline rises above ground. The terrain here is flat, sparsely populated and underlaid with rock. The line is constructed on steel supports. Here and there, sand has been pushed up against the pipe to make an overpass bridge so that camels can clamber across. For some reason, camels refuse to step over an exposed pipeline.

From Shu'bah, the traveler – Barrel X – is boosted westward through the pump station at Rafha and the auxiliary unit at 'Uwaigilah. These auxiliary units with their powerful gas turbines and accompanying equipment, are housed in giant, portable, aluminum-clad vans. The turbine which drives the pumps draws its fuel from the oil in the pipeline.

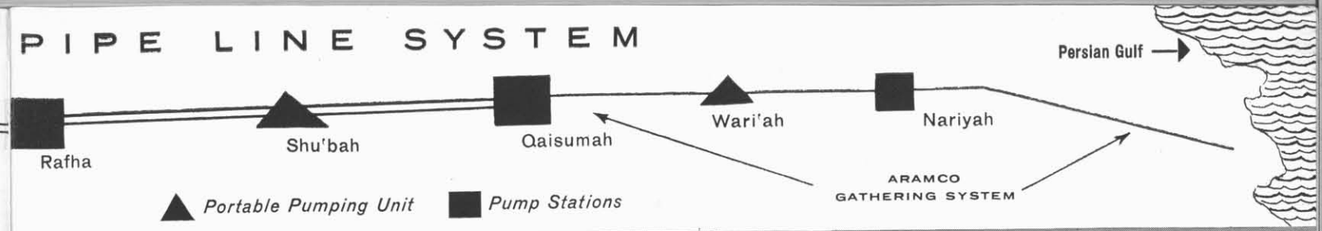
Barrel X has now traveled over 350 miles since leaving Qaisumah. The next stop is Badanah. "Stop" isn't really the right word – the oil is always moving – but when Barrel X arrives at the main gate at Badanah its pressure is almost down to zero. A series of small booster pumps takes Barrel X and moves it along to the main pump house – the major installation at Badanah–where its pressure is built up to a husky 1,040 pounds per square inch.

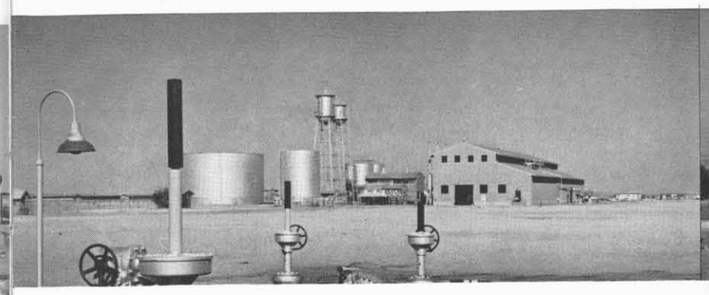
Barrel X is only one of 3,460,000 barrels of crude oil present in the pipeline at one time. On an average, 20,000 barrels pass through Badanah every hour. The tremendous quantity of crude oil handled by Tapline and the great distance it must be transported explains why pumping units like Badanah are so necessary: If Tapline attempted to propel oil directly from Qaisumah to Sidon, they would have to build up tremendous pumping pressure – at Qaisumah, the starting point. Such pressure, at least 7,000 pounds per square inch, would mean using pipe three inches thick to withstand the stress. Instead, the more practical method of boosting the pressure on the oil at key intervals along the line is used.

An elaborate electronic control panel at the pump house follows and directs the various movements of Barrel X, as it travels westward, through Badanah's auxiliary unit at Jalamid, and on to Turaif, the next station where its control is then taken over. The pumping unit at Jalamid is remote controlled by VHF (very high frequency) radio from Badanah. The 5,000 h.p. combustion gas turbine is the most powerful unit of its kind presently in oil pumping service.

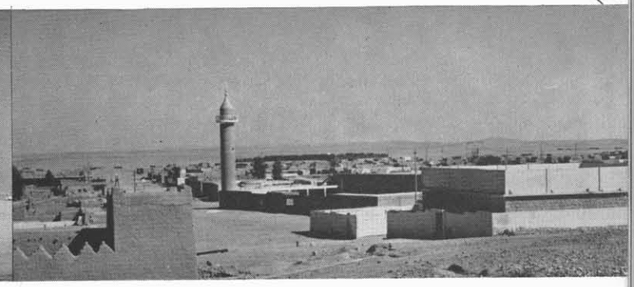
Badanah and Jalamid together produce close to 19,000 h.p. – equivalent to the power of a small ocean liner.

But these technical installations – the pump house, huge storage tanks, garage and warehouse – are only a part of the pump stations like Badanah. Like many small American towns supported by a single industry, Badanah is a community in itself. There are about 190 Tapline employees at the station most of whom live in housing provided for them. The residential and recreational areas are landscaped with shade trees–poplar, eucalyptus, chinaberry.





Pump house and storage tanks at Badanah.

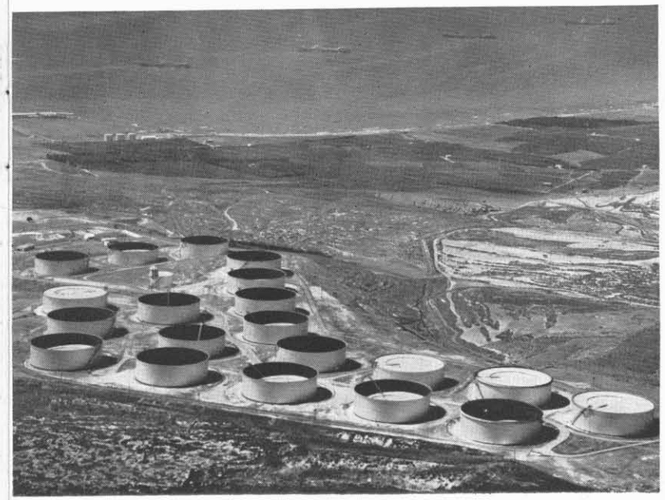


Town of Ar'ar, adjacent to Badanah Pump Station.

A community center is the focal point of social life. Among other things it offers a dining hall, library, snack bar and a lounge. Areas are set aside for motion pictures, ping-pong and billiards, and dances are often held at night on the sun-deck pavilion. A tennis court and a golf course nearby provide outdoor recreation, and behind it a modern guest house for visitors was completed early last year.

But the Tapline hospital is perhaps the most impressive of the features found in the Badanah community. A staff of 60, including seven doctors and 30 nurses, operates a modern medical center for the use of all employees and the local Arab population. This 32-bed hospital treats six to eight thousand patients each month and is set up to handle anything but the most specialized of surgical operations. It works closely with the local government in treating disease and fighting epidemics; and it has cooperated with the American University of Beirut on a number of medical research projects.

Looking down at Tapline's Marine Terminal at Sidon, Lebanon. Tankers take on oil, lined up at submarine loading berths.



The adjacent town of Ar'ar, founded only 13 years ago, grew step by step with Badanah and has since become the administrative capital of the Northern Province of Saudi Arabia. Construction is going on steadily at Ar'ar, prompted in part by Tapline's Home Ownership Program which offers home-building loans to Saudi Arab employees.

The town's strategic location and unique facilities have resulted in a population boom; Ar'ar alone has over 5,000 people. The *suq*, or marketplace, is developing into the commercial center of the area, and it is no surprise that the watering troughs there, in the middle of an area that has been dry for 2,000 years or more, draw thousands of nomadic herdsmen to the town each year. The troughs were provided by Tapline from water sources that had been drilled to supply thirsty pipeline workers back in the days when the big line was being built. More than 7,000 camels have been watered at Ar'ar in a single day.

Meanwhile, Barrel X has climbed 1,778 feet above sea level on its trip to Badanah. As it moves on toward Turaif, the land continues to slope upward toward the mountains in the west. After crossing the border of Saudi Arabia a few miles beyond Turaif, the 80-mile stretch across Jordan is covered with hard basalt and volcanic lava, disintegrated into chunks ranging from a few pounds to as much as several tons. This is the location of the last of the turbine pumping units at a place called Qaryatain.

Beyond Jordan, Barrel X moves across the southern tip of the Syrian Region of the United Arab Republic – a land that closely resembles west Texas and New Mexico.

At the Syria-Lebanon frontier, Barrel X begins its descent into the beautiful Bekaa Valley, which runs northward between two mountain ranges, the Lebanon and the Anti-Lebanon. The next stop – and this time the stop is a real one – is the Sidon Terminal in Lebanon and the hold of a tanker riding the blue Mediterranean. ■

SUN CLOCKS

Talk about clocks that operate on a grand scale! The simple sundial depends on the sun for its shadow hand and on the earth's rotation for its mainspring

STROLLING along a Babylonian plain about 4,000 years ago, a scholar stopped to watch the lengthening shadow cast by a tree as the sun traveled across the sky. By scratching a few lines in the dirt, he found he could chart the movement of the rays in spaced time intervals.

The ancient scholar created what was probably the world's first sundial.

Today, with all our modern means of clocking the hours, we are still intrigued by the classic sundial which, with no moving parts, can translate the suns shifting position into time.

A seven-ton bronze dial graces the entrance to New York's ultramodern Rockefeller Center, and a professor at a California university recently perfected a global dial by which he can tell at a glance what the sun is up to in any part of the world.

The early Babylonian dials consisted of a vertical shadow-casting rod or *gnomon*, not unlike the tree the inquisitive scholar saw. They filled a longfelt human need to apportion the day into segments more detailed and exact than could be done by the ebb and flow of the tides.

Word of the new invention quickly spread to Egypt where scientists created the "L" shaped dial. Simplicity in itself, the "L" was turned to the East each morning and the West each afternoon. One of these dials on display in a Berlin museum is believed the earliest known in existence.

About 300 B.C. the great Chaldean scientist Berosus introduced a hemicycle dial to Greece. It consisted of a hollow hemisphere placed with its rim perfectly horizontal. One famed hemicyclium, with Greek letters used to mark the hours, was found at the foot of Cleopatra's Needle in 1852 and is now in the British Museum.

One of the most interesting of the ancient gnomons was the Tower of Winds in Athens. The tower was shaped like an octagon, on the walls of which the eight major winds were represented. Over them were eight dials.

It wasn't long before Rome took up the fad and by 293 B.C., a dial was set up in the courtyard of the beautiful temple of Quirinus. Another was brought to Rome from Sicily by Valerius Messala during the First Punic War. What Messala did not know was that a dial constructed at the latitude of Catania, Sicily, would not function accurately in Rome. He learned this to his great consternation when he tried to calculate a battle timetable north of the Eternal City.

References to the sundial soon crept into Roman literature and today we read that the death of the great Roman orator Cicero was foretold by the omen of a raven striking off the shadow rod of a dial in Tusculum.

Before long, Rome was so cluttered with sundials that the playwright Plautus was moved to grumble:

"Confound him, too, who in this place set up a sundial to cut and hack my days so wretchedly into small pieces! When I was a boy, my belly was my sundial. . . . This dial told me when was proper time to go to dinner. . . ."

Arab scientists of medieval times took the Greek sundial, simplified and perfected it. Egyptians under the reign of Fatimid Caliph Al-Aziz (A.D. 975-96) founded an astronomical observatory in Cairo. In pursuit of their studies, the Egyptians perfected the astrolabe, a member of the sundial family that could not only depict the sun's movements, but served oldtime navigators as a sort of sextant.

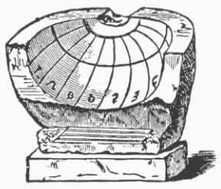
Abul Hassan, noted thirteenth century Arab writer, introduced the cylindrical dial and the hour system for dividing time. The classic dials of Arabia bore, in addition to the line marking the solar movement, a line which pointed to Mecca.

During the Middle Ages, sundials became the vogue throughout Europe. Fashioned of ornately carved stone and wrought iron, they were esteemed as suitable presents for kings and other eminent personages. Architects of the period decorated cathedrals, castle courtyards and public buildings with sculptured dials.

These time-tellers came into full flower during the Renaissance period, and designers outdid themselves with unique designs ranging from tiny pocket dials to great pillar dials for the homes of nobles and vertical dials to adorn churches.

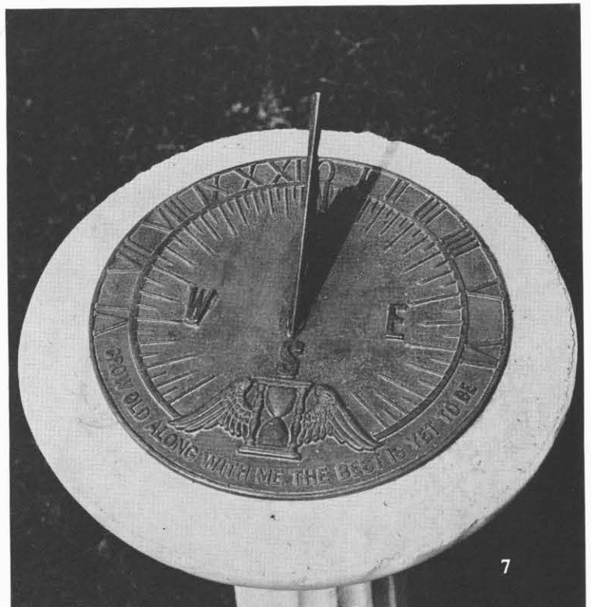
The famed painter Hans Holbein designed an elaborate combination sundial and water clock as a New Year's gift for King Henry VIII.

Perhaps the most unusual dial ever created appeared during this period. This Rube Goldberg-type invention was set up in a Paris square where it drew large crowds. It consisted of a cannon set atop a great flat dial. When the sun



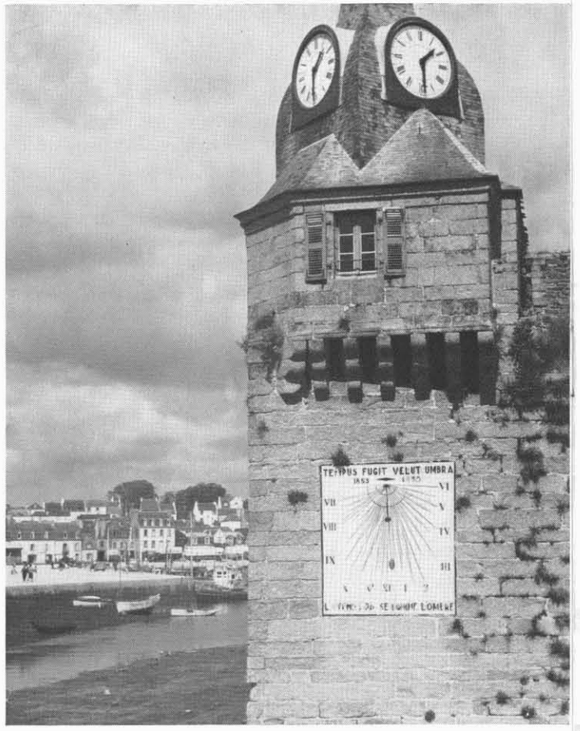
This type of hemicycle dial was introduced to Greece in about 300 B.C.

Pocket sundial of 1547 was called journey-ring.



A beautifully wrought bronze dial reads 1:50 sun time. Manufacturers warn against inferior dials which are poorly made and will be accurate in only one latitude.

Gracing the wall of a thoroughbred stable in Massachusetts, this dial has a Latin motto from Ovid: "Time glides with rapid foot."



Sundial in southwestern Brittany, France, reads 12:20 while clock says 1:29. One reason is that clock shows daylight time.

SUN CLOCKS

reached its zenith, its rays focused on a magnifying glass which in turn ignited a fuse and the cannon boomed the noon hour.

The portable dials sported by Renaissance dandies were ornate affairs which served the same purpose as a watch — as long as the sun stayed out. Made from delicately chased gold or silver, many of these dials were encrusted with precious gems. One such type, the Shepherd's dial, which tells time by the altitude of the sun, is still used by peasants in the Pyrenees Mountains.

Also popular was the ring dial which consisted of a brass ring with a small hole through which the sun's rays cast a beam on an inner ring, opposite, and by its position indicated the time.

The sphere dial, a sort of skeleton universe, has been made famous by the model on display in front of New York's Rockefeller Center. The great bronze sphere held by Atlas is inscribed with the 12 signs of the zodiac. The axis of the sphere points to the North Star. It is 15 feet high and has a diameter of 21 feet.

Even this dial is dwarfed by the monster erected in India in 1730 by the Maharajah of Jaipur. The gnomon of this giant dial, which was restored in 1902, towers 90 feet and extends 147 feet at the base. Its shadow moves about a foot every five minutes.

One of the most unusual timepieces in existence is the 300-year-old specimen that lies in the garden of Calder House, venerable seat of Lord Torpichen in Calder, Scotland. This many-faceted instrument actually contains 41 separate dials all stemming from the same base.

Dials have outlived their usefulness as time checks and aids to navigation. But they are still popular the world over as ornaments in gardens and on college campuses. Such dials can be purchased in the United States at virtually any price from a few dollars to several thousand.

President Eisenhower had a dial specially made several years ago for his Gettysburg farm. It has a large "E" built into the gnomon and on it is inscribed the exact astronomical address of his farm.

One of the most charming aspects of the sundial is the ancient custom of inscribing mottos on the face. Some are scholarly, some point up a moral, others are whimsical. The motto inscribed on the Eisenhower dial runs in philosophical vein:

TIME IS

Too Slow for Those Who Wait
Too Swift for Those Who Fear
Too Long for Those Who Grieve
Too Short for Those Who Rejoice

But for Those Who Love

TIME IS ETERNITY

Contrast this with the terse slogan on a dial at the Royal Military Academy at Woolrich, England:

"Either Learn or Go." ■

*"It was natural to a scholarly and reflecting mind to point the moral of passing time in the brief sentence which inspires thought."**

Sundial Mottoes

On this moment hangs eternity.

•

Time and tide tarry for no man.

•

Time as he passes us, has a dove's wing,
Unsoiled and swift, and of a silken sound.

•

Grow old along with me,
the best is yet to be.

•

As a shadow, so is life.

•

Snatch the present hour and fear the last.

•

A stitch in time saves nine.

•

Today for me, tomorrow for thee.

•

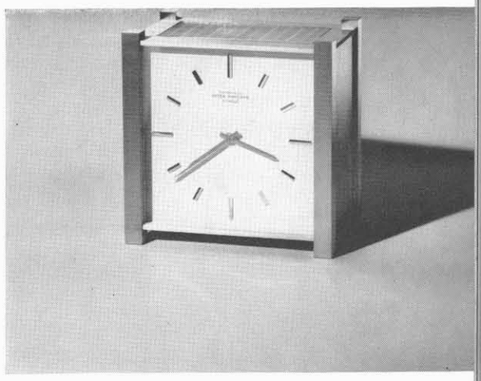
Walk while you have the light.

•

One day telleth another: learn.

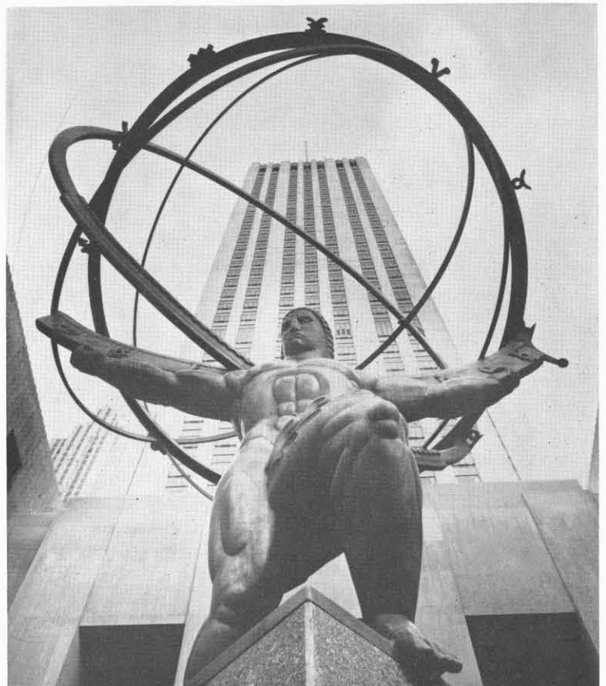
*The Book of Sundials — Mrs. Alfred Gatty

Watches were already in wide popular use, but 17th century schools continued to teach their students all about sundials.



The clock that is wound by light! Electric cell uses light energy to run this 5½-inch-square clock.

Swiss church shows decorative possibilities of sundial even when modern clock in tower records sunless hours.



At Rockefeller Center, 45-foot Atlas dial has armillary sphere 21 feet in diameter. On outer ring, sphere carries twelve signs of zodiac.

Why We're Hot

Strange as it may seem, we feel most discomfort from the heat when that body of ours is trying hardest to keep us cool

THE thermometer in the shade of the clubhouse stood at 96 degrees. Out on the center court of the Forest Hills Stadium, the naked sun blazed down on the two contestants who were in their fifth set of fast savage tennis. Suddenly, reaching for a volley, one of the players collapsed. He was treated with ice packs, for heat prostration, and was unable to complete the match.

An extreme case? Perhaps. Thousands of persons, however, suffer from the heat each year, without exerting themselves unduly or going anywhere near a fire. Just from getting too hot. All of us, when we become overly warm, feel discomfort.

What causes this, exactly? When the outside temperature goes up, or we engage in physical exercise or grow nervous or excited, does our body temperature rise?

It had better not — or we're in serious trouble. In fact, we don't feel right when our body temperature rises even one or two degrees over the normal 98.6 degrees Fahrenheit that remains constant at all times. It does not change with the weather, but adjusts to it.

The reason that we feel uncomfortable when we get too warm is that our whole body is working strenuously to get rid of the excess heat. Blood vessels expand so that they can carry blood to the surface and throw off heat. More blood is circulated, and for a while, until additional blood can be manufactured, it is thinner, more dilute. This accounts for the lethargic feeling we get during the first hot spells of spring or summer. There is also a slowdown in our metabolism — that chemical process in living cells by which energy is generated and new material is assimilated to replace what was lost. And our sweat glands, triggered by the nervous system, step up their activity.

Perspiration cools us off through evaporation; this is the most important means we have of getting rid of excess heat. When perspiration stops — as sometimes happens when the humidity is very high and there is too much water in the air for it to absorb perspiration — the body temperature rises; this can lead to a heat stroke, such as the one described above.

Besides evaporation, body heat is also reduced by conduction (coming in contact with cooler substances, such as in swimming and in walking on a tile floor) and through radiation (throwing heat off to cooler surfaces surrounding the body).

Some people, the very young and the very old, the very thin and the infirm, require more heat than others. Those who have become accustomed to hot climates are not as bothered by high temperatures as those whose bodies must work harder to adjust. Generally speaking, human efficiency is at its lowest when the mercury is at its highest.

Nearly everyone finds high humidity oppressive, but contrary to popular belief, we are at our healthiest and most efficient in fairly moist, rather than in dry weather. Dryness, in itself, is not beneficial, as we know when we put pans of water on the radiator. Moisture in the air is absolutely essential. A relative humidity of 65 per cent is most desirable for health and work, medical authorities say. The ideal temperature is about 64 degrees outdoors and 70 degrees indoors.

Sharp changes in temperature, these authorities assert, are the things to watch out for. In experiments, men have withstood temperatures of over 200 degrees, without ill effects, when gradually administered. Others who fly from the north to the tropics and step out of air-cooled planes into 90 degree heat are flattened. Those susceptible to such changes are advised to take two or three days if they travel south in winter—gives them time to adjust.

Lightweight, light-colored, porous, absorbent apparel is recommended for hot weather. Indoors, it is important to keep the air moving by cross-ventilation or by a fan.

Some day, it is claimed, we will be able to control the weather, just as now we make the desert bloom. That Utopia — if, indeed, it would be one — is still a long way off. In the interim, we'll have to depend on air-conditioners and electric fans, on frosty drinks and balmy breezes — and on our own blood vessels, sweat glands and common sense in exercising physical and emotional restraint — to keep us cool when the thermometer soars. ■

First Stop in Space

What awaits man on the **Moon,** that radiant steppingstone to the heavens?

IT is an awesome inhospitable place — a place of blinding light and utter blackness, of searing heat and inhuman cold, of towering mountains and enormous craters, of deadly rays and choking dust. Not a tree is to be found on this bleak barren wasteland, not a plant, not a single blade of grass. Not a trace of life, as we know it. No water. Only rock. A huge boulder could be crashing down on you, and you wouldn't hear it. There is no sound here: only perpetual soul-chilling silence. For there is no air.

When the first visitor from earth lands there, a few years hence, he will not be charmed.

Yet, from the distance of a quarter of a million miles — a little more or less, depending on its orbital position — this satellite of ours (the one that has been spinning around us for some two billion years, not those pipsqueak man-made newcomers) is truly a wondrous thing. No other jewel in the dazzling night heavens is so near to us and can so bewitch us with sheer beauty and charm. Throughout the ages, its lovely mellow radiance has lightened man's darkness and beguiled his senses and heart.

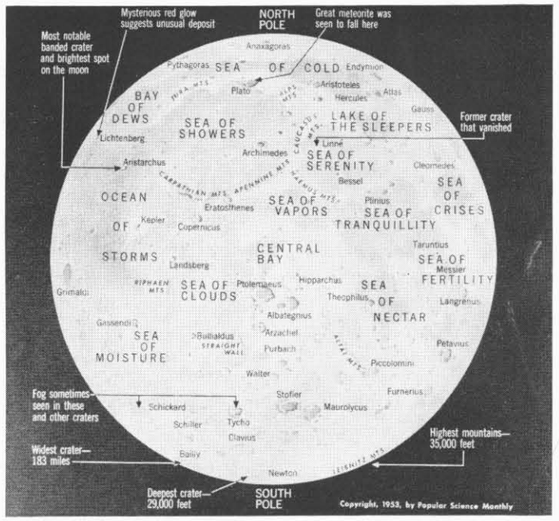
The ancients worshipped the moon, and used its light as their principal means of night illumination. The Greeks named Selene the Moon Goddess, in tribute to its splendor. Mariners have always looked to the moon as the guardian of the tides, and as a comfort on their lonely vigils. Poets, composers, artists have always found it indispensable. And lovers — what would Anthony and Cleopatra, Romeo and Juliet, all the world's lovers, have done without this very embodiment of romantic inspiration?

For thousands of years, man has dreamt of visiting the moon. Literature abounds with fanciful stories of such a conquest. Now that we are on the threshold of an actual voyage, many conjectures on what we will find there are being voiced. But until the first spaceman lands on the moon, or circles it at close range, our observations must be limited to those that have been made from the earth.

Although it has the appearance to us of a crescent or disk, the moon is actually spherical in shape — a huge rocky ball, 2,160 miles in diameter. While a quarter the size of the earth, it is only 1.23 per cent of its weight. Because of a much lower moon mass, the gravity is only 16 per cent of the earth's. This accounts for the relative "weightlessness" on the moon — the fact that if you weigh 150 pounds on earth, you will weigh only 25 pounds on the moon. Fortunately for spacemen, this will enable them to get around with heavy space suits and equipment.

The moon travels around the earth, in an elliptical orbit — accounting for the slight variations in distance — at an average speed of 2,300 miles an hour. It completes one orbit approximately every thirty days. As it takes the moon the same time (one month) to make one full rotation on its axis, this always keeps the same face towards the earth. Because of this, we never see the moon's other side from the earth — and the earth remains fixed in the lunar sky, never rising or setting.

There is little evidence to suggest that the "dark" side of the moon (which is hidden from us but which also re-



Much of moon was mapped in 17th and 18th centuries after the invention of telescope. Astronomers named "seas," craters and mountains after the great scientists and philosophers of the past.

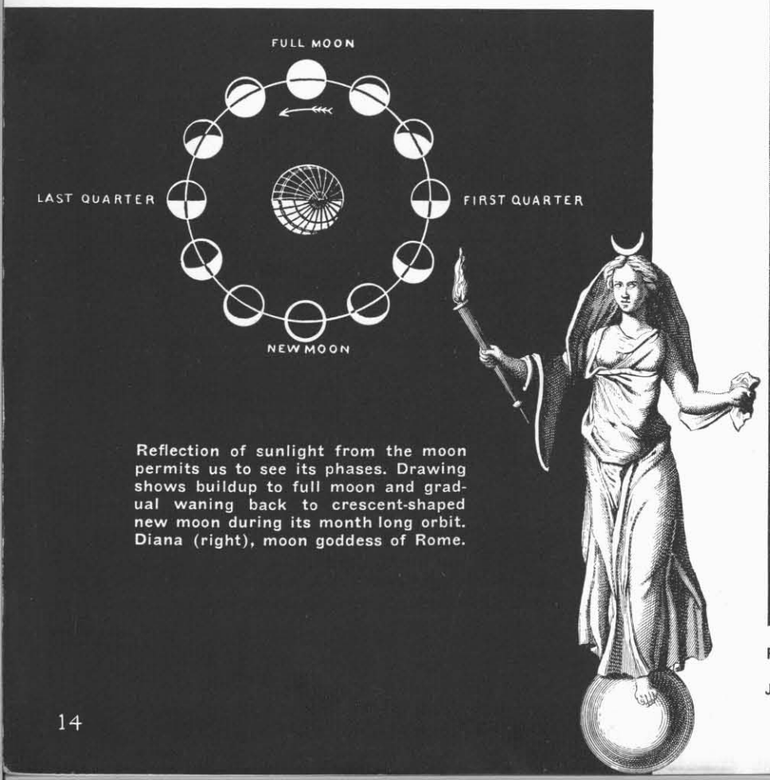
FIRST STOP IN SPACE

ceives sunlight) is much different from the side that is turned to us. The visible surface of the moon is very rugged, studded with mountains, some of which are as high as Everest, and craters, some of which are thousands of feet deep and hundreds of miles wide. (Heights and depths are determined by taking angular measurements of shadows cast in sunlight). Recent studies made with high-powered telescopes and from photographs taken from artificial satellites have provided added detail about this pock-marked surface, but no important new discoveries.

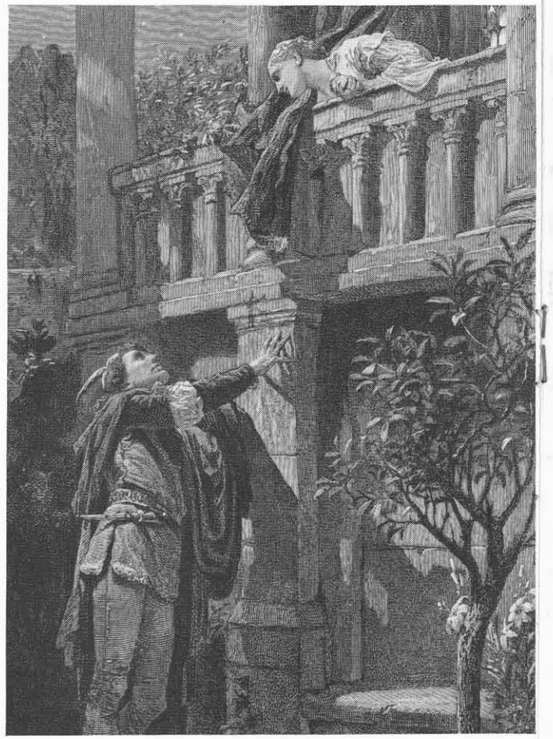
When, after the invention of the telescope, the moon was mapped in the seventeenth and eighteenth centuries, astronomers named the giant craters after the great scientists and philosophers of the past – Aristotle, Plato, Archimedes, Copernicus, Brahe. Galileo named the largest chain of mountains after the Apennines; and, assuming that the large dark areas he saw – which were relatively free of mountains and craters – were stretches of water, named them "seas" – the Sea of Serenity, the Sea of Tranquility, the Ocean of the Rains, the Ocean of Storms. These romantic appellations have remained, despite the fact that the absence of water on the moon has long been established.

We say that the moon shines, but it does not, of course, generate any light of its own, as do the sun and the stars. That heart-warming silvery glow we receive is simply the light the moon reflects from the sun. When one of the other planets, which also do not give off light of their own, comes between the sun and the moon, the moon is eclipsed.

In the course of its revolution around the earth – taking one lunar month – the moon goes through various phases. When it is directly between the sun and the earth, the side facing us is dark – this is the "new moon." Gradually, as the moon moves, we see it as a thin crescent, then as a half circle. When it is a full circle, we call it a "full moon."



Reflection of sunlight from the moon permits us to see its phases. Drawing shows buildup to full moon and gradual waning back to crescent-shaped new moon during its month long orbit. Diana (right), moon goddess of Rome.



Romeo: Lady, by yonder blessed moon I swear
That tips with silver all these fruit-tree tops, —
Juliet: O! swear not by the moon, the inconstant moon,
That monthly changes in her circled orb,
Lest that thy love prove likewise variable.

On the second half of its orbital journey it shrinks, or wanes, until it is wholly obliterated again from our view.

As the moon waxes and wanes in its cycle, so does the height of our tides. The tides are a response of the moving waters of the oceans to the gravitational pull of the moon and the sun. As the moon is much nearer to us, its pull is much stronger – more than twice that of the sun. Each day the moon rises about fifty minutes later, on the average, than the day before, which explains why it is that we sometimes see the moon in the morning and afternoon.

The time of high tide is also later. Twice each month, when the sun, moon and earth are directly in line, and the pull of the moon and the sun are combined, we have the highest of high tides (called the springs). Twice each month, when the sun, moon and earth form a triangle and the pull of the moon and the sun are opposed, we have the lowest tides (called the neaps).

By the friction caused in changing the tides, the moon acts as a brake on the rotation of the earth; and, because of this braking process, the moon in turn is being slowly pushed farther from the earth. Hundreds of millions of years ago, the two bodies were much closer together, revolving and rotating more rapidly, and causing gigantic tides. Gradually, as they slowed down and moved farther apart, the length of their days increased, and the strength of the tides decreased. This process will continue in the future. The distance between the earth and the moon will continue to grow; the pull of the moon and the tides will lessen. The earth will rotate at a diminishing rate, lengthening our days – until the time, several billion years from now, when it will come to a complete stop; then the earth will have the same face toward the moon at all times.

There are several theories concerning the origin of the moon. Some believe that it was never part of the earth; that it was created, separately, from the sun. Others hold that it was torn from the earth when that body was still in a molten state. Those who support the latter theory point to the decreasing tides; and also to the great scar or depression on the earth's surface that holds the Pacific Ocean. The floor of the Pacific, unlike those of the other oceans, is not lined with a layer of granite. Could the granite floor of the Pacific, geophysicists ask, have been shorn away when the moon was born?

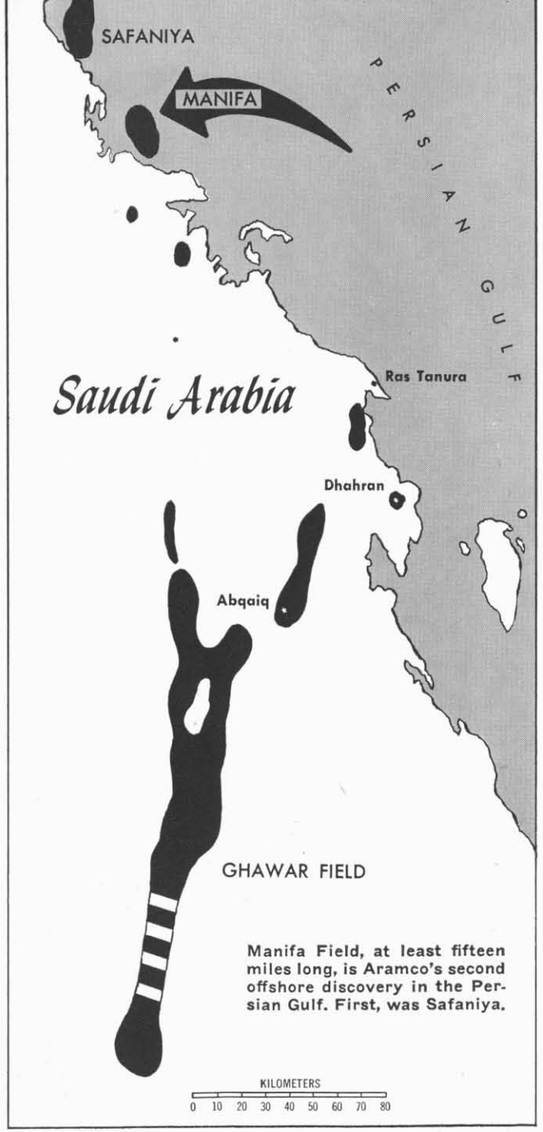
Samples from the moon's surface should settle this question. They should also settle the debate on how the craters were formed – by meteorites, as is claimed by some, or by volcanic activity, as is held by others.

Moonlight emblazons the waters of the Persian Gulf off the east coast of Saudi Arabia. The ship is a lateen-sailed fishing dhow.

Other important matters await the investigation of the first earth travellers who will shortly visit our next door neighbor in space. These will have to be hardy and courageous pioneers. They will have to bring their own air and sound and water and food, and protect themselves against temperatures that reach 212 degrees F. during the day (at which water boils) and plunge to minus 238 degrees F. at night. They will have to combat radioactive rays and weightlessness, sheer precipices of towering rock, treacherous crumbling surfaces, veritable quicksands and oceans of dust. And loneliness – a piercing paralyzing loneliness that, like so many things up there, is akin to nothing we have on earth.

They will persevere, though, as pioneers have always persevered. And they will be richly rewarded. For they will unravel many of the mysteries of the universe, and, perhaps, some of those of life itself. And from this first stepping-stone to the heavens, this local stop in interplanetary and interstellar travel and exploration, they will go on out into space. ■

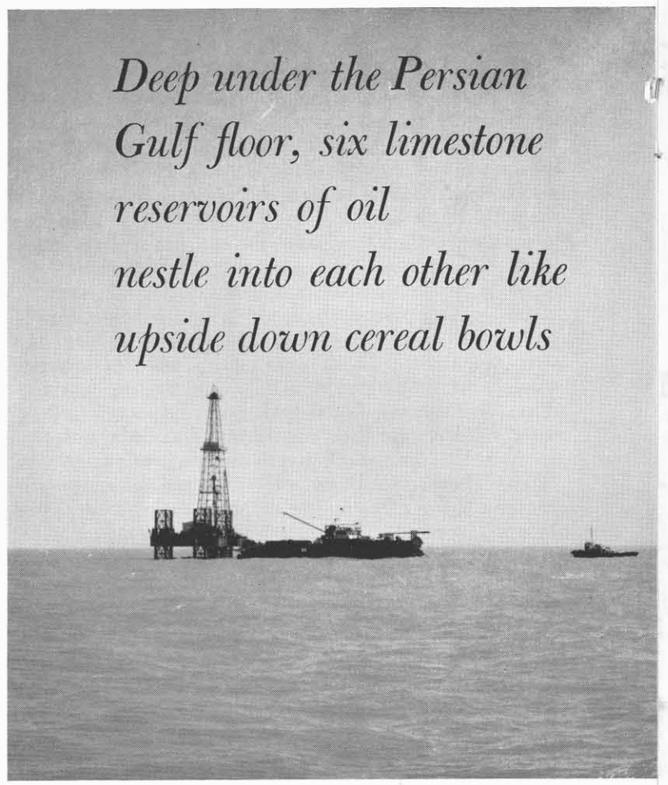
Drawing shows how a man-made satellite might look from a vantage point out in space. Our oldest satellite is the moon.



Manifa Field, at least fifteen miles long, is Aramco's second offshore discovery in the Persian Gulf. First, was Safaniya.

MANIFA: OIL FIELD UNDER THE SEA

Deep under the Persian Gulf floor, six limestone reservoirs of oil nestle into each other like upside down cereal bowls



Aramco's mobile drilling platform and drilling barge at work in the Persian Gulf on well No. 7 of Manifa Field.

THE water taxi sliced a furrow through the emerald green of the Persian Gulf and splashed the white spume against the cockpit windows. As the Saudi Arab helmsman steered ENE by the compass, he worked his windshield wiper to brush away the caked salt. Although he was in contact by radiotelephone with the rock-filled Manifa pier astern and with the unseen floating island ahead, he had to thread his way through a maze of coral reefs lying athwart his 14-mile course. One by one, he picked up the navigation buoys and lights and gave them a wide berth.

"Don't you write anything nasty about those coral reefs," Sam Zimmerman, the burly chief geophysicist of the Arabian American Oil Company, was saying, as he shielded his camera lens from a splash of spray. "Maybe they are a hazard to navigation. But they came in mighty handy at one time. They made a nice solid platform, jutting out of the sand and mud on the floor of the Gulf. On just about every one of them, we set up a light rig and bored a shallow hole. We wanted to see what sort of rock structure lay underneath, to see if there was a good enough chance to warrant the costly gamble of drilling a deep well."

What was learned from structure drilling was enough to whet the appetite but not enough to place any bets, Zimmerman went on, as a porpoise arched up off the starboard beam and slid away again. "So we took another hard look, back around 1950. We made a seismic survey, setting off a series of artificial earthquakes in the water so we could record the echoes and learn the shape and depth of the rock layers below.

"We used a surveying boat equipped with radar for precise ranging. We used a recording boat to tow the sensitive seismometers to pick up the echoes. We used a shooting boat to suspend a nitramon charge five feet beneath the surface of the water. Each time we blasted off, a geyser shot out of the Gulf, just like Old Faithful."

The seismic work confirmed the structure drilling. Aramco now knew enough to gamble on the wildcat well that discovered the Manifa Field at the end of 1957. "So you can credit a combination of the structure drill and the seismograph with the discovery of this underwater field," Zimmerman said.

Sam was just on a busman's holiday. As a geophysicist — an earth physicist — he had long since completed his pioneering work at Manifa and had turned to farther reaches of Aramco's concession area in Saudi Arabia. But he wanted to see what had happened at Manifa since his days there.

Joe Turner squinted through the spray as he pointed a pudgy finger. "See that speck up there to the north? That's one of our wells." Nobody doubted that Joe could see that speck. He wanted to. As Aramco's offshore drilling foreman, he had drilled that well and had a paternal affection for it. But nobody else could really make out the Christmas tree — the cluster of fittings, valves and gauges which poked up a dozen feet out of the water, the only visible evidence of an oil well bored 8,000 feet down through the rock layers below the bottom of the Gulf.

"And down south there, looking into the sun? You can't see it, really, but there's another well, just over the horizon. I know, one of you visitors is going to want to shoot a pair of our wells on a single piece of film. You can't do it. They average three to four miles apart."

"How much of this stuff are you producing?" someone asked.

"Oh, we aren't producing any, yet," Joe replied. "Just a few samples for testing. We also used a little to oil that airstrip you saw back near the Manifa pier. But mostly, we're just drilling, just trying to find out what it is we've found, so Aramco can plan properly, can make the right decisions as to when and how to bring the field into production. We already know how far the field stretches on its western and southern flanks. The well you're visiting today will help mark the eastern flank. Then we'll go north. We're drilling what we call delineation wells."

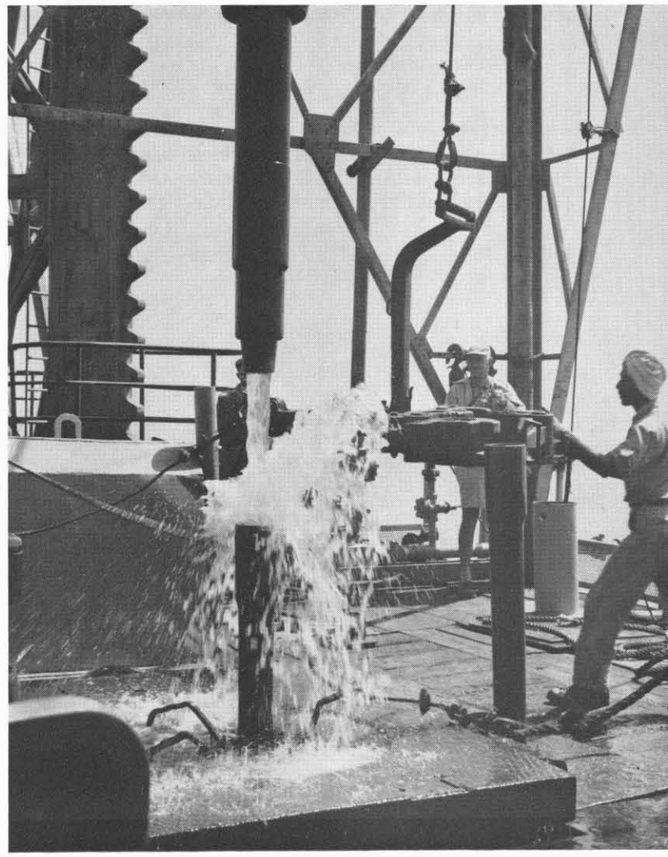
From the drilling so far, Aramco knew that the oval-shaped field stretched at least 15 miles along its north-south axis and five miles across. Beyond the possibility of doubt, Manifa was a big discovery, although presumably not as big as the Safaniya Field, a little farther north, which was the first offshore field discovered in the Persian Gulf and the largest offshore field yet discovered anywhere in the world.

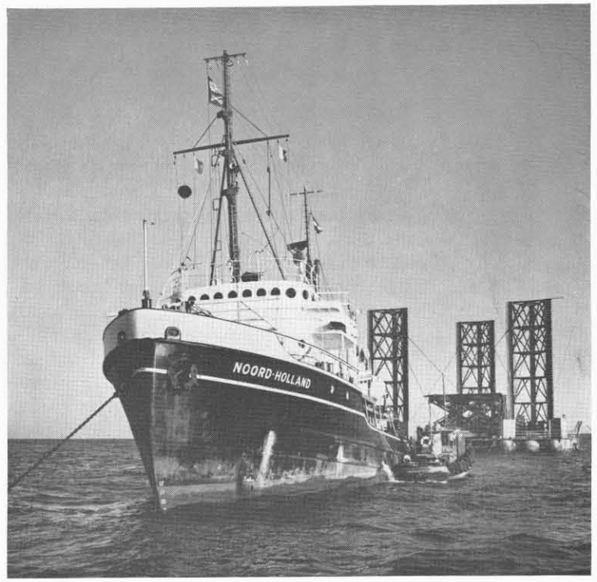
Admittedly, the initial drilling at Manifa was disappointing. The wildcat well, Manifa No. 1, was drilled more than a mile deep into the same sandstone that is so productive at Safaniya, only to find no oil there. Later on, that wildcat was carried down to nearly two miles through the most productive limestone reservoir in Aramco's onshore fields, only to find it water-logged. Sandwiched in between those two failures, however, Manifa No. 1 discovered not one but six reservoirs of porous limestone, all nestling into each other like a series of cereal bowls turned upside down, and all saturated with oil. These elongated bowls, known as anticlines, were the type of structural formation in which oil might accumulate. It was this sort of formation which the early structure drilling and seismic survey had revealed.

In three of these six rock layers Aramco had never before found oil anywhere in Saudi Arabia, either on land or at sea. The other three had previously proved only mildly productive in certain onshore fields. In none of the six reservoirs was the oil identical. It ranged from a heavy crude oil with a high fuel oil content, to a lighter crude with more gasoline. One of the six, the Manifa Zone, was the thickest layer and contained the most oil.

Now the helmsman was heading the water taxi's prow

Lengthening the drilling pipe on Manifa No. 7. A 30-foot length of pipe is being added in order to drill deeper.





Dutch tug, Noord-Holland, averaged 3½ knots towing huge platform half way around the world from the Gulf of Mexico to the Persian Gulf.

Arrived off Saudi Arabia, after 115-day, 10,000 mile tow, platform is rigged up and made ready for jobs in Manifa Field.

MANIFA

into the waves to moor alongside a broad-beamed lady officially carried on Aramco's books as Barge 136, but known affectionately as the Queen Mary. A little tug bobbed astern at the end of a long hawser, like a poodle on a leash. A few fishing lines hung limply, awaiting perhaps a tasty bass-like *hamur,* perhaps a speckled whitefish.

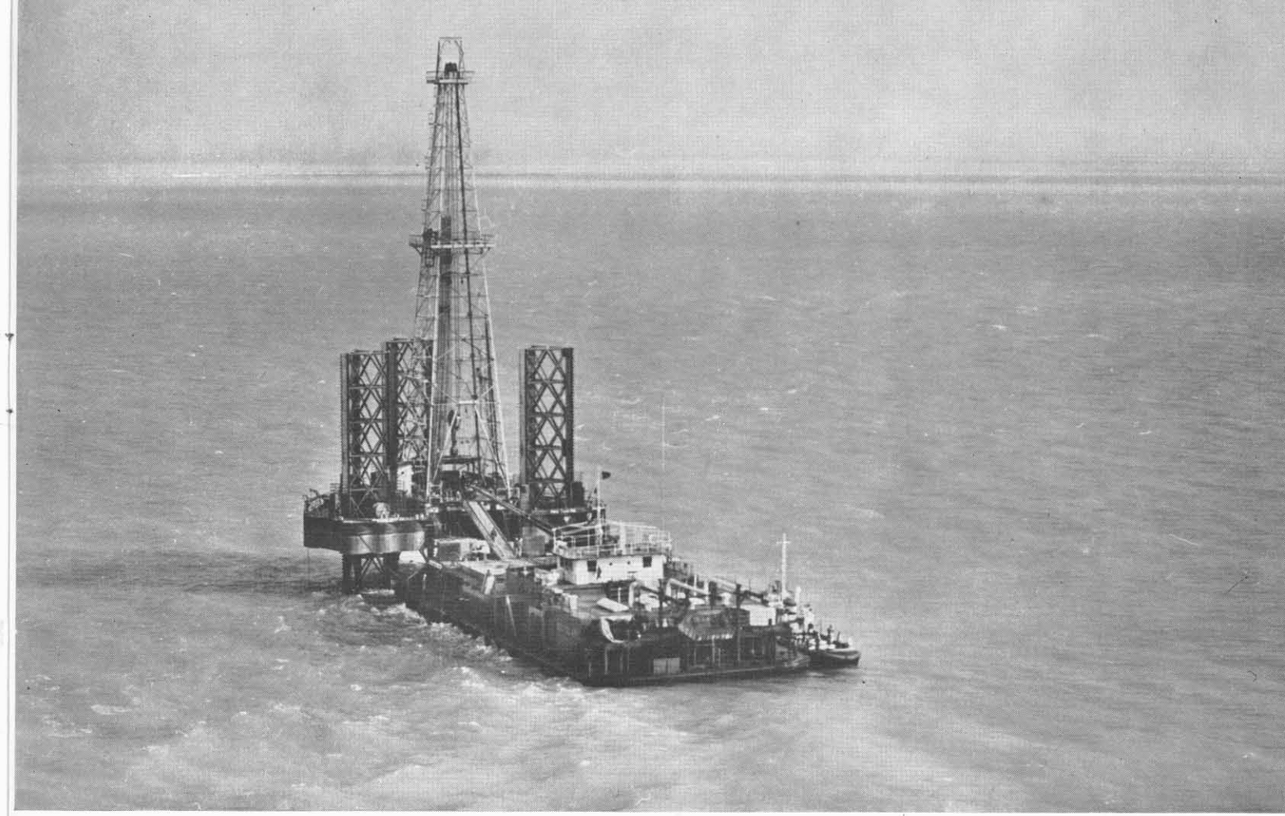
One of the passengers leaped on board, to be greeted by the roar of her diesel engines and the belch of her exhausts. The Queen wasn't putting on party manners for anyone. She was all business. Her measurements were a shapeless 174 by 70 feet, with squared-off bow and stern, but she was seaworthy enough to have survived a 10,000-mile tow from Lake Maracaibo in Venezuela. She was so plain and simple that little time was ever lost due to failure of fancy gadgets. She even slaked her thirst from the Gulf by distilling 50 gallons of drinking water every hour and by using sea water for mixing the drilling mud. All she asked was that her make-up be kept neat, by four men wielding paint brushes right around the calendar.

Proudly Joe Turner showed off, on the Queen's lower deck, the mud pumps, mud storage, shale shakers, laboratories, tool room, and, on the weather deck, the handling crane, casing racks, drill pipe racks, galley, two staterooms, anchor winches, even lifeboat. But the Queen was aging a little, and Joe had found a younger love. With an extra bounce to his step, he strode up the steep ramp connecting to a stately princess. She didn't have a nickname as yet, but she needed one, for who could wear such a formal title as "Aramco Mobile Drilling Platform No. 1?"

She was a floating island who, to mangle a metaphor, lifted herself up by her own bootstraps. When her trim triangular hull was floated into position for drilling Manifa No. 7, she jacked her three triangular legs of latticework steel down through the 36 feet of water and 19 feet of mud until they hit coral bedrock. As she kept stretching down her tripod legs, one foot per minute, her 800-ton hull rose slowly, like a huge elevator, until it cleared the surface of the waves by a good ten feet. Then she skidded into position her 136-foot-high drilling derrick from amidships to her stern, right over a little platform which in time would support a Christmas tree.

"Maybe she did cost us $1,000,000!" Joe Turner was shouting above the whine of the platform's rotary table. "Maybe it did take us 115 days to tow her from the LeTourneau works at Vicksburg, down the Mississippi, across the Atlantic, through the Suez and around the Arabian Peninsula. But she's paying off at $100,000 per well. We don't have to drive a steel pile platform, heavy enough to support the drilling derrick and drawworks, down to bedrock at each well location. We don't have to go to the trouble of erecting the derrick from scratch at each site."

Just then, the cry of "Yalla!" (literally, "Come on, with the grace of God!") split the air. The Saudi Arab driller, at the controls, stopped the mud pumps and slowed the rotary table to a halt. His ten-man drilling crew, all Saudi Arabs, had to "make a connection" – to add another 30-

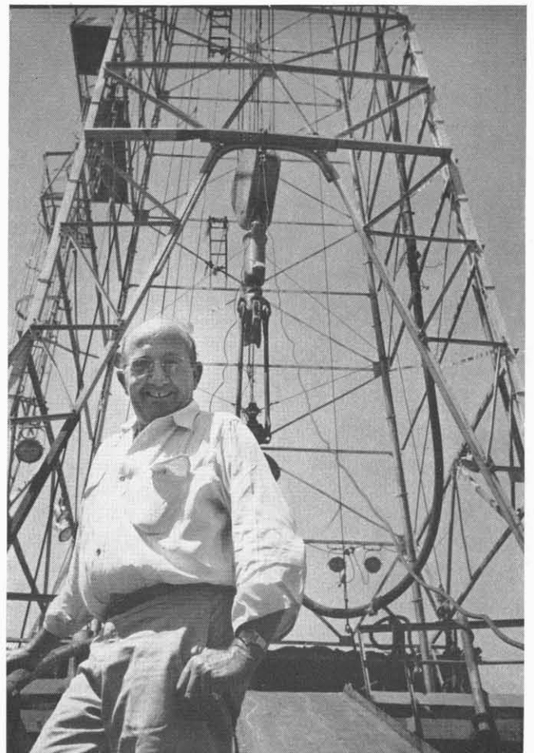


Mobile platform makes unnecessary the costly and arduous job of driving steel piles down to bedrock at each well location for sturdy support to hold derrick and equipment.

foot joint of steel drill pipe – before the drill bit could bore any deeper than the present 3,157 feet. Now a finely trained team weaved on and off the floor of the derrick as if they were on a basketball court. The driller hauled the drilling string 30 feet out of the hole. One rigger secured the drill pipe with the serrated teeth of the "slips." Others broke the connection between the round drill pipe and the square "kelly." The driller lowered the kelly into the "rat hole" for safekeeping. A rigman detached the hook from the kelly and attached the hook to a new joint of drill pipe. The driller raised the new joint, set it down on top of the drilling string, and spun the new joint in. Machine wrenches tightened the connection. Then the kelly was hooked on again, hauled out of the rat hole, spun into the new joint, and tightened with machine wrenches. The driller started up the mud pumps, lowered the whole drilling string and felt for the bottom of the hole.

The cry of "Yalla!" provided a punctuation mark at the end of each step. With a final "Yalla!" the driller restarted the rotary table and resumed drilling – for another 30 feet.

Making the connection had taken only six minutes. ■



Aramco's offshore drilling foreman, Joe Turner, has worked the Gulf ever since first discovery well at Safaniya in 1951.

The Battle called

BUNKER HILL

The first flexing of American military muscle wound up as a British victory—and oddly enough didn't even take place on the hill it was named after.

JUNE 17th is a holiday in one small corner of the United States: Boston, and surrounding Suffolk County, Massachusetts. Yet all Americans might well observe the date of Bunker Hill. That fierce fight made it possible for us to celebrate Independence Day on July 4th. Of all our Revolutionary battles for liberty, the most crucial was that we call the Battle of Bunker Hill — a British victory, fought on another hill.

In June 1775, a disorganized colonial army waited uneasily around Boston, without artillery or ammunition to attack the British, who were encircled. (George Washington had not yet been appointed commander-in-chief.) The British, in spite of the fighting at Lexington and Concord in April, could not believe that these rough colonists were dangerous.

On the night of June 16, General Artemas Ward sent about a thousand Yankees to Charlestown, to fortify Bunker Hill. Arriving officers looked at the two adjacent hills, Breed's and Bunker's (where Mr. Breed and Mr. Bunker pastured cows), and decided on Breed's. Every man took pickaxe or shovel and set to work in the darkness. At dawn, an American redoubt crowned Breed's Hill.

The astonished British prepared to accept this challenge. They could not guess how many Americans were behind the redoubt. They did not suspect that the Breed's Hill detachment was isolated, without food, water or sufficient ammunition, and with no plans for relief in case of attack.

Sir William Howe, protecting his Redcoats with a harbor bombardment, ferried 2,500 men from Boston to Charlestown. They assembled at the foot of Breed's Hill, ready for attack. According to army regulations, every British soldier wore a heavy uniform and carried a firelock, an ammunition box and a knapsack with provisions for three days! — 125 pounds to carry up a steep hill tangled with long grass and bushes. In training, they had been taught to fire in volleys, not to aim.

The Americans, looking down from their redoubt, were weary, hungry and thirsty, but they were there because they wanted to be; and they knew, as did all frontiersmen, how to handle firearms. They were eager to start; Colonel William Prescott held them back: "Powder is scarce. Don't fire until you see the whites of their eyes."

Closer and closer came the British ranks, until they were only 15 paces away. Then American muskets blazed, and every shot seemed to find its mark (British volleys, too high, were useless). Hundreds of British fell dead or wounded, and disordered companies fled out of range. But again they formed ranks, and again marched up the hill. Again the Americans waited, fired, and again cut the Redcoats to pieces and drove them down the hill.

Howe ordered the heavy knapsacks discarded and the remnants of his army began the ascent again, over ground strewn with dead and wounded. A later British ballad told their feelings:

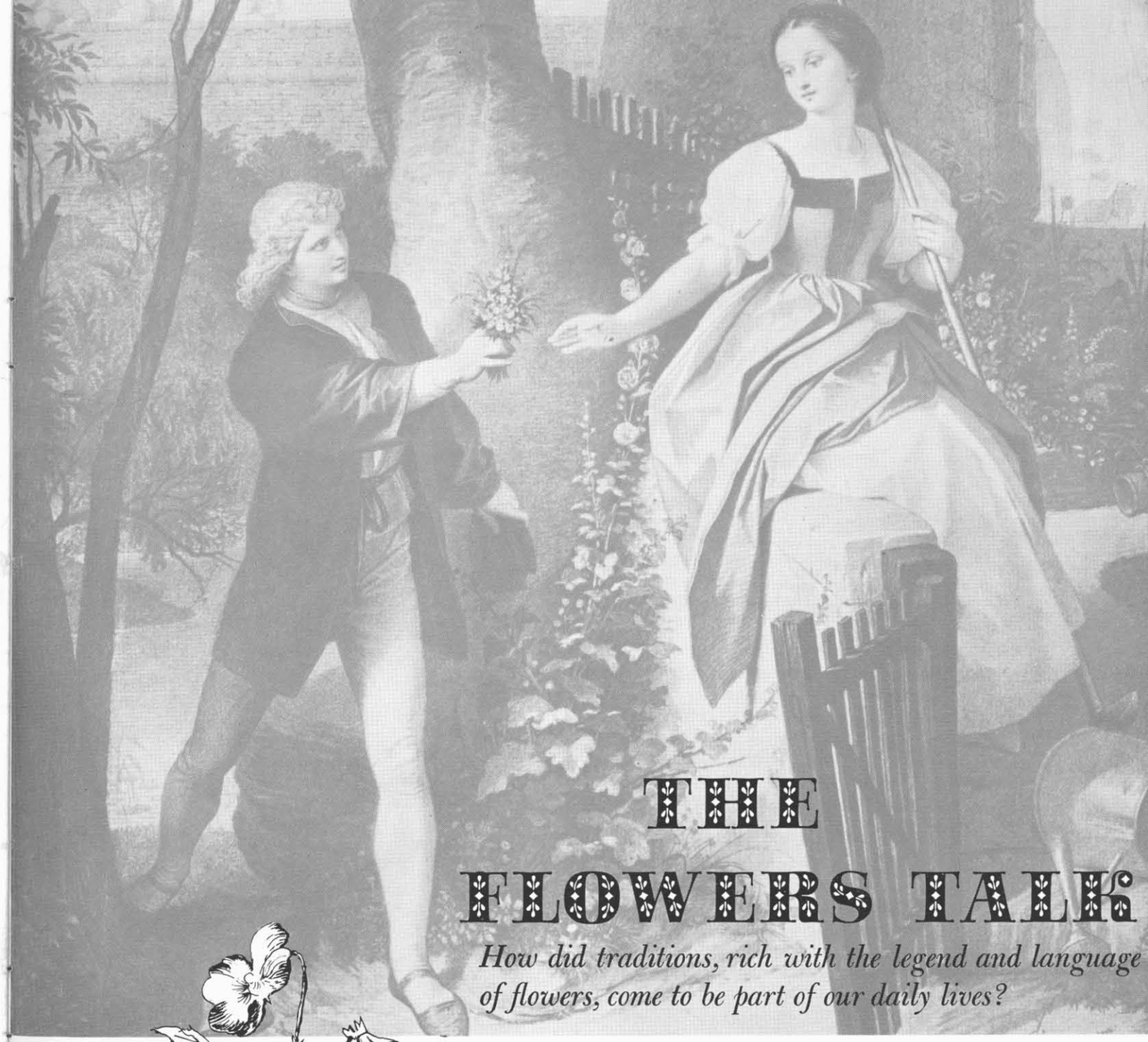
> "But oh! the cruel scene to paint,
> It makes my blood run chill,
> Pray heaven grant I never more
> May climb up Bunker's Hill."

But they did climb, this time in columns, with bayonets ready to attack the redoubt. American ammunition was exhausted, and few men had bayonets. Somehow they managed to retreat, covered partly by reinforcements nearby who had arrived too late to fight.

The British had won the redoubt, but General Howe paid with more than half his men for a useless hill in Charlestown. The British killed and wounded numbered more than 1,200; the Americans lost less than 500. Britain never forgot Breed's Hill, and no officer in that battle ever dared an open attack against the Americans during the rest of the Revolution.

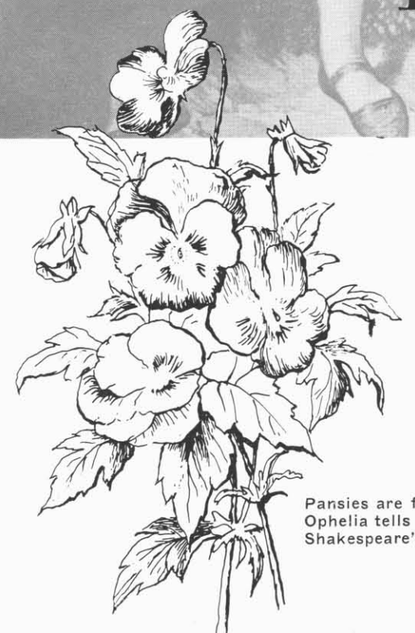
Boston and Charlestown (now a part of Boston) remembered that day of June 17, 1775, too. On the fiftieth anniversary, General Lafayette came to lay the cornerstone for a memorial on the site of the redoubt; old veterans of the battle cheered him, and Daniel Webster gave the address. The Bunker Hill Monument it was — and is — called, though it crowns Breed's Hill. It took 18 years to collect the needed $150,000 for the monument, but on June 17, 1843, it was finally dedicated, with Daniel Webster back to give the oration.

The 221-foot granite column marks a historic site, and the beginning of American independence. To one who studies the battle errors on both sides, it may seem to stand for the terrible stupidity and sacrifice of war. But above all, Bunker Hill speaks of courageous men: Americans who waited at the redoubt for a force three times their number; British who marched bravely into the deadly fire. ■



THE FLOWERS TALK

How did traditions, rich with the legend and language of flowers, come to be part of our daily lives?



Pansies are for thoughts, Ophelia tells us in Shakespeare's "Hamlet."

WHEN children ask, "Where do flowers come from?" the Spanish tell their sons and daughters a beautiful legend about the creation of the world. When the work was finished, they say, the angels assembled on a rainbow to view the magnificent panorama of mountains, deep blue lakes and lush forests. The rainbow became so weighted with angels, it shattered into a million pieces and fell to the earth. As the pieces touched the ground, the plants — which until then were without flowers — blossomed in all the glorious hues of the rainbow.

The happy bride who tucks orange blossoms into her bouquet is continuing the centuries-old symbolism of flowers. She probably chooses them for their beauty and fra-

White roses expressed the purity of heart of sainted Princess Elizabeth of Hungary in 13th century. Red roses (right) often symbolize man's unfolding spirit.

Heal-All took its name from wide range of curative powers it was supposed to have.

Orange blossoms have always graced the bridal bouquet as an expression of wedded bliss.

Scientists now confirm healing value of shrub, St. John's Wort, long heralded by the ancients.

A garden walk bordered by tulips. In background are azaleas, bleeding hearts and pansies.

THE FLOWERS TALK

grance, or because her grandmother carried them. But the orange tree, which bears both fruit and flower at the same time, has been, since the Middle Ages, our symbol of a wish for fruitfulness in marriage.

How did traditions such as these, rich with the legends and language of flowers, come to be part of our daily lives? Each custom has its own unique history; many born in the unwritten past and revised in their meanings by geography and time. This December, we'll hang mistletoe, not, like the Druids, to ward off evil spirits, but to welcome joyous ones. At Easter we'll display the flower that is the favorite symbol of majesty and innocence, the pure white lily; brought to us, not from the Holy Land but from Bermuda, carried there by a sea captain from Japan. In ancient Egypt it was the custom to present each dinner guest with a small bouquet. Today, the floral centerpiece at a dinner party is still the fragrant insignia of hospitality.

In courtship and love, birth and death, success and accomplishment, man uses flowers to express his affection, sympathy, admiration, loyalty for fellow human beings.

After the disastrous fall of Paris in 1814, Napoleon I abdicated, and a month later was banished to Elba. But he boasted to his friends, "I will return with the violets!" His followers adopted the violet as their secret sign of loyalty to "Corporal Violet," and all wore rings and watch guards of violet color. On March 30, 1815, when he reentered France, Napoleon was welcomed with showers of violets — then in full bloom.

Flower symbols have left their marks in every civilization. The young man chosen by the Aztecs to be their Tezcatlipoca, "god of gods," for one year before becoming a human sacrifice at the festival called Toxcatl, was bedecked with garlands and other ornaments as befitting his high dignity. The Romans, borrowing from legend, made a crown of laurel leaves one of the highest honors they could bestow upon a citizen. In the Christian Era, the miracles of several saints were expressed through flowers.

Dorothea was martyred in the reign of Emperor Diocletian, about the year 303 A.D. As she was walking to her execution, the judge's secretary, Theophilus, scoffingly said to her: "Be sure to send me some fruit and roses, Dorothea, when you get to Paradise." Immediately after her execution, while Theophilus was at dinner with companions, a young angel appeared, bringing him a basket of apples and roses with the simple message, "From Dorothea."

St. Elizabeth was a Princess of Hungary in the thirteenth century, who devoted her life to deeds of charity. One day as she was leaving the castle with a supply of food, she met her husband returning from the hunt. He demanded to know what she had under her cloak, and when she hesitated, fearing his displeasure because she deprived herself to give to the poor, he drew the cloak aside. He found only . . . to Elizabeth's surprise as well . . . a basket of beautiful white roses.

Linnaeus, the eminent Swedish botanist whose classification of plants became a foundation of modern botany observed that certain plants opened or closed at prescribed hours of the day. He constructed a flower clock of plantings which verified the observation.

Botanists in other countries altered the basic plantings with blooms from their own latitudes which opened at different times through variations in climate. A typical Flora's dial, or flower clock follows:

Flowers which open or close at the time given

1:00 AM	Scandinavian sow thistle closes	1:00 PM	Common purslane opens
2:00	Yellow goat's beard opens	2:00	Purple sandwort closes
3:00	Common ox-tongue opens	3:00	Dandelion closes
4:00	Hawkweed opens	4:00	White spiderwort closes
5:00	White water lily opens	5:00	Jalap opens
6:00	Spotted cat's ears opens	6:00	Dark crane's bill opens
7:00	Garden lettuce opens	7:00	Naked stalked poppy closes
8:00	Scarlet pimpernel opens	8:00	Orange day lily closes
9:00	Field marigold opens	9:00	Cactus Opuntia opens
10:00	Red sandwort opens	10:00	Purple bindweed opens
11:00	Star of Bethlehem opens	11:00	Night blooming catch fly opens
noon	Ice plant opens	midnight	Late flowering dandelion closes

Part of the traditional mystery of flowers is bound up with their use in healing. Today's pharmacy has advanced from superstition to science. We no longer believe that waning moonlight and a quick rub with chick-peas will remove warts, and we see sketchy value in a prophet's sleeping on the "dream herb," *pulsatilla pateus;* but much of folklore, says Dr. F. H. Lucas, Professor of Horticulture at Michigan State University, has actual factual basis. Recent experiments showed, for example, that there is a bactericidal substance in St. John's Wort, a large group of plants that include herbs and small shrubs found in rock gardens. Folklore tradition had already pointed out the correct "recipe," advising patients to use only the petals and not the calyx of the plant. Scientists verified the wisdom of the advice when they discovered that only the petal extracts inhibit bacterial growth.

Some early medicine men, however, ascribed an unbelievably wide range of healing powers to a single wonder drug. Its reputed curative powers for sore throats, inflammation, internal bleeding, headaches, bruises, falls *and* hydrophobia gave *prunella vulgaris* its common name, Heal-All.

Other plants are not so friendly. Several in the world's history have been suspect of evil mastery over the humans who came in contact with them. A small atoll in the heart of the South Pacific still trembles the lips of nearby natives when you inquire. It is El Banoor, the Island of Death. The atoll is the name of the legendary Death Flower — a plant so big a man may enter it. A gorgeous cave of color and perfume, but a dangerous one. Lulled by its overpowering fragrance, a man is tempted to lie down on its lower petals and so fall into a pleasant but deep sleep. The fra-