STRANGE STORIES, AMAZING FACTS

STRANGE STORIES, AMAZING FACTS

Reader's Digest

STRANGE STORIES, AMAZING FACTS

**Stories that are bizarre,
unusual,
odd,
astonishing,
and**

THE READER'S DIGEST ASSOCIATION, INC.
Pleasantville, New York Montreal

Library of Congress Catalog Card No. 76-2966

Printed in the United States of America

Second Printing

About this book

While *Strange Stories, Amazing Facts* was being prepared for publication, we asked the staff to suggest a descriptive subtitle for the book. One member was enthusiastic about "a literary smorgasbord." Another strongly favored "a Disneyland for readers." Although cooler and, we choose to think, wiser heads prevailed and both proposals were vetoed, the metaphors are, in fact, apt.

This volume does offer an astonishing variety of subject matter, treatment, and tone. For example, "Will the Ice Age Return?" (a frightening and real possibility) and "Heaven's Artillery" (a story about meteorites) are enough to give one chills in a sauna, while "Bunga-Bunga" (an account of an elaborate hoax) and "Everything Has Its Price" (a tale of a remarkably persuasive gentleman who, among other felonious exploits, sold the Eiffel Tower and rented out the White House) would probably bring a smile to a wooden Indian.

In this book fascinating "hard" scientific articles about space exploration, solar energy, and the human body are companions with stories of psychic phenomena, vampires, and the curious superstitions of professional athletes. Wondrous discoveries about the earliest days of this planet are bound in with highly informed predictions about the world-to-be. History's greatest explorers, from the ancient Orientals to the astronauts, are found in the company of charlatans, real and fake artists, legendary beasts, and monumental eccentrics. The baffling questions about unidentified flying objects and the mysterious "clocks" that seem to govern all life on earth are discussed only a few chapters away from lighthearted articles about the evolution of our modes of dress and the origins of many of our most familiar phrases.

In short, we think you'll find this book a delightful companion—informative, funny, surprising, varied, thought provoking, unexpected. Here's your plate for the smorgasbord, your ticket to Disneyland.

The Editors

Contents

PART 1

PART 2

PART 3

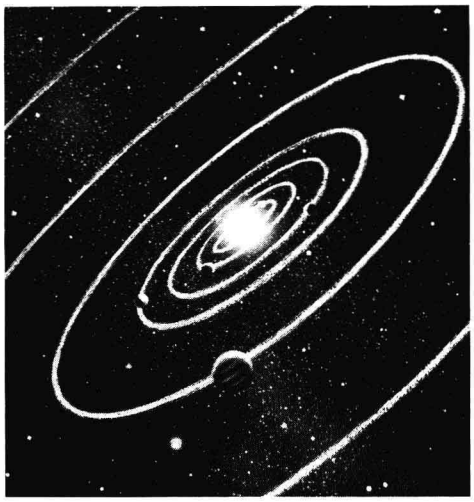
PART 4

PART 5

PART 1

The universe . . . eternally fixed or forever exploding?

The enigma of space



A DROP IN THE OCEAN OF SPACE. *When viewing his home against the backdrop of the universe, man feels humble. The earth (top left) is third closest to the sun and*

PORTRAIT OF THE UNIVERSE

How stars are born—from here to eternity

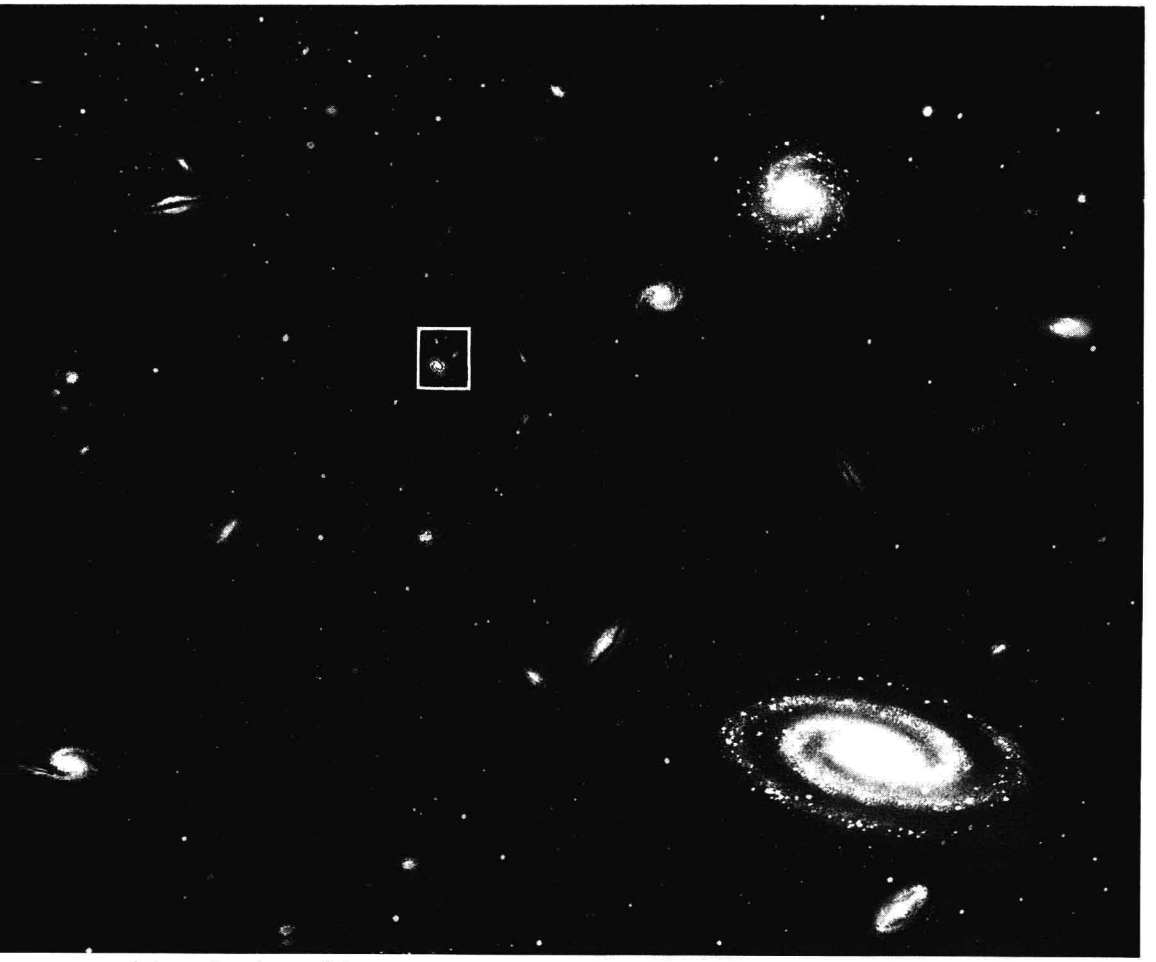
Looking at the sun and the stars is like gazing backward down a time tunnel. What is seen from the earth is not the stars as they are, but as they were when the light rays left the various heavenly bodies.

Light travels at 186,000 miles a second, and at this speed takes eight minutes to reach the earth from the sun. By the same token the closest star to the earth's solar system, Proxima Centauri, is seen not as it is but as it was 4.25 years ago.

With powerful telescopes it is possible to look back millions of years into the past of the universe and, by linking telescopes with sensitive photographic plates, even farther back—to a staggering billions of years ago.

With man's ever-increasing knowledge and use of more and more sophisticated equipment, we are more aware than ever that the earth is an insignificant dot when measured against the overwhelming backdrop of space.

The earth occupies third place from the sun in a system of nine planets—some with moons, others without—in orbit around the sun. This,



one of the smaller planets of the solar system. But the sun's vast empire is unimpressive when seen in its galaxy, the Milky Way (left), which contains innumerable suns, or stars. The Milky Way itself is insignificant when pictured against its neighboring galaxies (above), while in the infinity of the universe it is but a pinprick.

the solar system, is a tiny speck in a breathtakingly huge spiral, 100,000 light-years across, known as a galaxy.

This galaxy, in turn, is one of countless others in yet another system of galaxies so incredibly vast that it defies the imagination.

Distances between the earth and the nearest objects in space were first measured by a method of trigonometry known as parallax. This involves taking triangulated sightings on a star at six-month intervals or, in effect, using the diameter of the earth's annual orbit around the sun as the baseline of a triangle. If the baseline of a triangle and the angles at each end of it are known, the remaining dimensions of the triangle can be worked out.

Threefold success in 1838

Astronomers in the 17th and 18th centuries tried to calculate star distances by the parallax method, but it was not until 1838 that three astronomers, within a few months of each other, successfully and independently made parallax calculations of star distances.

Friedrich Bessel, director of the Konigsberg Observatory in Germany, measured a star called 61 Cygni as being just less than 11 light-years away; Thomas Henderson, Astronomer Royal for Scotland, announced that Alpha Centauri was 4.3 light-years from earth; and F.G.W. Struve, working at Dorpat in Russia, gave a value of the distance for Vega, now acknowledged to be 27 light-years away.

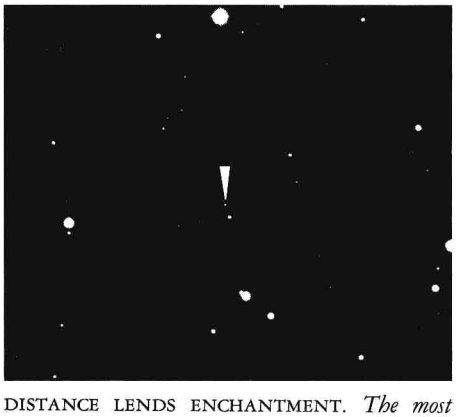
Later, the parallaxes of other stars were calculated, but beyond a distance of 100 to 150 light-years, the trigonometric method leaves an increasing margin of error—because of the very tiny angle at the apex of the triangles involved.

Star distances can, however, be measured by other methods, many based on how luminous a star is. To the naked eye all stars may seem white, or nearly so, but this is not the case.

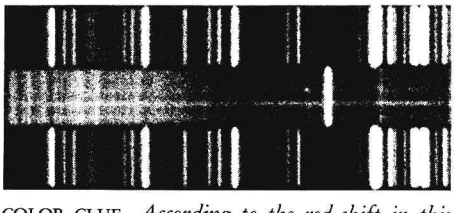
In the constellation of Auriga, for example, the star Capella is yellow. Betelgeuse, in Orion, is reddish, and Rigel is slightly blue.

An analysis of the spectrum of any distant object in space reveals its chemical elements and the temperature at which they are reacting, as well as the speed at which the body is traveling. From these clues astronomers can get an idea of the true brightness of a star, and by correlating this to its apparent brightness, as seen on earth, make an accurate estimate of its distance.

The estimation of the speed of a distant object stems largely from a scientific principle laid down in 1842 by the Austrian physicist Christian Doppler. This principle—known as the Doppler effect—is best demonstrated by relating it to the whistle of an approaching train. As a train draws near, the pitch of the whistle climbs higher, until the train passes. Then, as it recedes in the distance, the tone falls.



DISTANCE LENDS ENCHANTMENT. *The most distant known quasar is 3C-295, in Boötes, photographed in 1960 at the Palomar Observatory.*



COLOR CLUE. *According to the red shift in this quasar's spectrum, it is 5 billion light-years away. Probably there are even more distant quasars.*

The red shift

Two later 19th-century astronomers—Sir William Huggins in England and Hermann Vogel in Germany—independently made use of Doppler's principle.

When applied to light waves, the Doppler effect shows up in color. At the red end of the spectrum, light waves are longer; at the violet end, shorter. So, redness in light coming from a celestial body is taken to mean that it must be moving away from earth.

This phenomenon is known as the red shift. Conversely, light waves from a source that is *approaching* the observer tend to move up the spectrum toward the violet end, where they become stronger and more frequent.

The so-called radial velocities of many stars have been measured in this way. Thus, Sirius is approaching our solar system at 5 miles a second and Altair at 16. Aldebaran, on the other hand, is receding at 34 miles a second and Capella at 18.

Some other explanation for violet and red shifts in stars and galaxies may, of course, be possible. But most modern astronomers accept the principles of the Doppler effect.

In 1924 Dr. Edwin Hubble, of Mount Wilson Observatory in California, using the superior instruments then available, learned more about the red shift. He found that whole galaxies must be traveling away from earth at tremendous speeds. Hubble concluded that the whole universe is expanding, with everything in it moving farther apart from everything else. And as the galaxies move farther and farther away from our own, the radiation of light we get from them gets weaker and weaker. This, said Hubble, is why starlight is too feeble to illuminate our night skies.

The "Big Bang"

Why should the universe be expanding? The idea ties in with one of the main theories about the birth of the universe, expounded in 1930 by the Belgian astronomer Georges Lemaître. His was the "Big Bang" theory, which suggested that about 10 billion years ago all the matter of the universe was contained in a primal atom—which he vividly described as a superdense "cosmic egg."

This, he said, exploded, and its many fragments became galaxies—one of which contains our solar system—all moving apart at incredible speed.

Another popular belief—the "Steady State" theory—was advanced in 1948 by British cosmologists Hermann Bondi, Thomas Gold, and Fred Hoyle, who suggested that the universe is eternal and that it has always existed.

They said that matter is continuously created, apparently from nothing, at the rate of 62 atoms of hydrogen per cubic inch of space every billion years.

This is sufficient to form new galaxies to fill in the gaps caused by the expansion of the universe.

The "Pulsating Universe"

In 1965 the American astronomer Professor Allan Sandage adapted the "Big Bang" theory and developed it into his "Pulsating Universe" theory.

He suggested that the universe is created, destroyed, and then re-created in 80-billion-year cycles. At the moment, he said, the universe is only 10 billion years along in the expansion stage, and it will continue to expand for another 30 billion years before the galaxies overcome the force of the "Big Bang" and begin to contract.

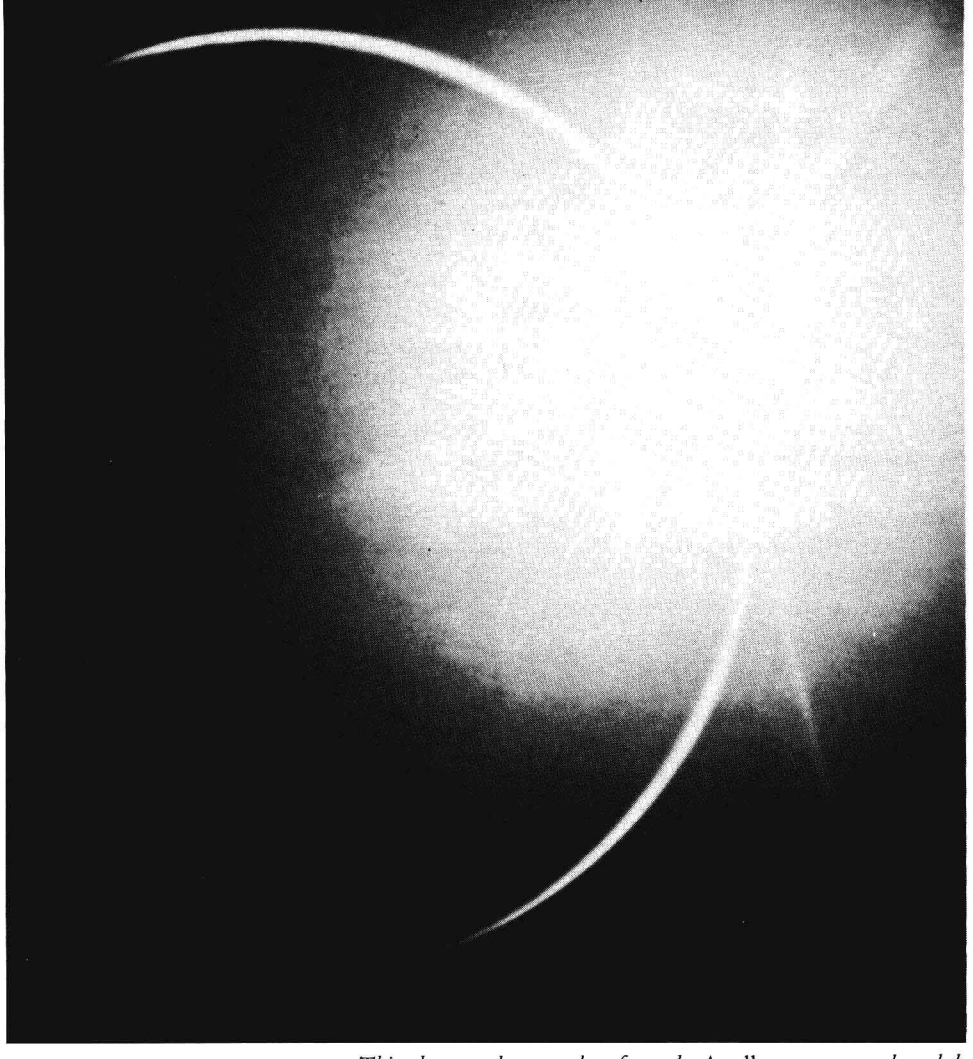
Eventually, he maintained, moving at millions of miles an hour, they will converge and fuse again into their primal atoms, which will then explode once more to restart the cycle.

FACTS ABOUT OUR NEIGHBORS

OUTSIDE the earth's planetary system, the nearest star to the sun is Proxima Centauri, at a distance of 4.25 light-years. But it is by no means the brightest star in the earth's heavens. The four brightest are Sirius, the Dog Star (8.7 light-years away), far-distant Canopus (98 light-years), Alpha Centauri (4.3 light-years), and Arcturus (36 light-years).

The most distant body that can be seen with the naked eye from earth is the Great Spiral Galaxy in the star cluster, or constellation, known as Andromeda—more than 2 million light-years away. It appears only as a faint patch of light in the sky.

The largest star visible to the naked eye is probably Alpha Herculis, a red giant—the name given to stars that are losing their heat. The smallest known stars are about the size of planets—less than 10,000 miles in diameter. The smallest yet detected is Wolf 457, which, at 3/1,000 the size of the sun, is smaller than the earth. Some stars may even be less than 1,100 miles across. By the standards of the earth's solar system, the largest stars are enormous. The variable star VV Cephei, at 1 billion miles in diameter, for example, is 1,220 times the size of the sun. (A variable star is a pulsating star, growing bright, then dim.) The most densely populated area of the heavens is considered to be the central part of the Milky Way (the earth's galaxy), toward the constellation Sagittarius.



THE SUN ECLIPSED BY THE EARTH. *This photograph was taken from the* Apollo 12 *command module during its expedition to the moon in November 1969.*

THE SAVAGE SUN

It is a normal star, like millions of others

In the order of the universe, the sun is an ordinary, medium-sized star. Yet its energy and violence almost defy imagination.

It is a dense mass of glowing matter, a million times the volume of the earth, and in a permanent state of nuclear activity. Every second, 4 million tons of hydrogen are destroyed in explosions that start somewhere near the core, where the temperature is about 25 million degrees Fahrenheit.

More energy than man has used since the dawn of civilization is radiated by this normal star in a second.

The earth's entire oil, coal, and wood reserves would fuel the sun's energy output to the earth alone for only a few days.

Tongues of hydrogen flame leap from the sun's surface with the force of a billion hydrogen bombs. They are forced up by the enormous thermonuclear explosion at the core of the sun, where 564 million tons of hydrogen fuse each second to form helium. Matter at the core of the sun is so hot that a pinhead of it would give off enough radiation to kill a man 100 miles away.

Slow-burning bomb

The sun, therefore, is like a vast hydrogen bomb, burning slowly. It is only its vast size that makes its energy output so phenomenal. In fact, its output is about one-fifth that of the human body—in relation to volume.

Sometimes the sun's surface is partly covered by dark patches known as sunspots, thousands of miles across. They are probably caused by magnetic disturbances, but are not fully understood. From the sun's surface tens of thousands of fountains of blazing gas, called spicules, spurt out every second. They reach out 6,000 miles, then fall back within minutes.

The number of sunspots is greatest about every 11 years, and over the same cycle earthly phenomena of aurora variations, magnetic storms, and radio blackouts are observed.

Solar flares

Loops of bright gas, or prominences, arch 100,000 miles into the sun's outer atmosphere, or corona. But these are small compared with solar flares.

These eject electromagnetic waves, which travel at the speed of light and reach the earth in about eight minutes. They are followed by other particles which take half an hour to reach the earth. A day later, slower particles arrive.

One of the largest recorded flares occurred on November 12, 1960. A cloud of hydrogen, 10 million miles wide, stretching back 46 million miles, collided with the earth and started a violent chain of disturbances.

Aurorae, normally seen within 1,500 miles of the poles, displayed much more spectacular, shimmering colored ribbons than usual.

Two days later, teleprinters produced nonsensical messages, and radio communications were blacked out. Electric lights flickered as if a thunderstorm raged, yet the skies were clear. Some of these effects lasted more than a week.

A suggested explanation of these phenomena is that solar flares in some way send out nuclei of hydrogen atoms and electrons. Traveling at 400 to 600 miles per second, they begin to reach the earth's atmosphere about 50 hours after the flare and produce the disturbances.

THE SAD TALE OF HSI AND HO

ONE DAY a very long time ago a hungry dragon tried to eat the sun. The Emperor of China and his people were terrified. At first, a tiny bite was taken out of one side of the orb. Then a quarter, a half, and finally the whole sun had gone, and there was nothing but a circle of white light around the black space where the sun had been.

The frightened, but resourceful, Chinese knew what to do. They ran around in the strange twilight, shouting and screaming defiance at the dragon, beating drums, banging gongs, and whacking hollow wooden ducks until the startled dragon moved away. The sun was saved, but the Emperor, now more angry than scared, ordered that the Imperial Astronomers, Hsi and Ho, depicted here attending their Emperor in happier times, should be beheaded for failing to warn him in time of the dragon's approach.

Astronomers have long enjoyed the anonymous rhyme that has become their epitaph:

Here lie the bodies of Hsi and Ho,
Whose fate, though sad, was visible:
Being killed because they did not spy
Th' eclipse which was invisible.

The tale is but a myth—the astronomers' names derive from that of the sun's legendary mother, the goddess Hsi Ho. How long ago the first solar eclipse was observed is uncertain. But according to the Shang oracle bones (inscribed animal bones), the Chinese recorded one in 1217 B.C. Chinese scholars later decided that the sailing moon briefly hid, or "ate," the sun.

MYSTERIES OF THE MOON

Where a stone can lie untouched for 3 billion years

Even the rocks returned to earth by the Apollo missions have failed to answer the many puzzles of the moon. Still, today, it remains the strange satellite, which has been the source of myth and legend since prehistoric man looked at it—and wondered.

The moon is the earth's closest companion in its endless journey around the sun. The distance between the earth and moon is 239,000 miles. It takes 27.3 days for the moon to complete a full revolution around the earth, and it takes exactly the same time for the moon to spin once on its own axis. This means that the moon always presents the same face to the earth. So far, only the astronauts have seen its far side, although it has been photographed by satellite.

It was once thought that the moon was part of the earth and that it broke away, leaving a huge hole now filled by the Pacific Ocean. This theory has long since been discounted by mathematical calculations that show that the size of the moon and the volume of the Pacific do not correspond.

Probably, the moon and the earth were born about the same time—about 4.7 billion years ago. And they evolved from the same accumulation of dust and gases that went to give birth to the sun.

Russian probe

In October 1959 a Russian moon probe—*Luna 3*—circled behind the moon and took photographs that were later transmitted back to earth. As expected, the photographs showed mountains, valleys, and craters. But there was no sign of life. It is now known that the moon is entirely sterile—as it has undoubtedly been throughout its entire violent history.

Since 1959, more probes, including the manned U.S. Apollo missions, have circled behind the moon, and scientists now have detailed maps of its entire surface.

In July 1969 one of the most valuable cargoes in history was delivered to the Lunar Receiving Laboratory in Houston, Texas. It consisted of 50 pounds of rocks and dust brought back to earth by the crew of *Apollo II* from the moon's Sea of Tranquillity.

There were 46 rocks brought back by *Apollo II*—all from the top layer of the lunar surface. They were small, ranging from the size of a pea to five inches long. At first glance they looked very much like ordinary earth rocks, but when they were examined under microscopes, startling differences appeared.

The lunar rocks were pitted with small, glass-lined pockmarks. Some were covered with spatters of glass that formed whitish patches on the surface. And the soil samples were made up of 50 percent glass—most of it sharp, angular, and without color. On earth very little glass is found in the soil.

Different proportions

All rocks, whether from the earth, the moon, or elsewhere, are basically composed of the same elements that existed in space before the solar system was formed. So what lunar scientists found in the moon rocks was not a difference in elements but a difference in proportions.

The ratio of uranium to potassium, for example, was 4 times higher in the moon rocks than in those found on earth and 15 times greater than in meteorite samples found on earth. In all, 68 of the more than 100 known elements have been found in moon rocks.

The puzzle of the moon has been heightened by researchers who tested the effects of moon dust on bacteria and plants. Certain bacteria were exposed to four lunar surface samples. On three of them there was no effect. But when they were exposed to subsurface samples brought back to earth by *Apollo 12*, they died. No explanation for the results of the tests has yet been found.

In other tests corn was exposed to the samples as representative of a complex plant, with no apparent effect. But simple algae exposed to moon dirt appeared to thrive on the "food" from space and grew greener for no explicable reason.

Gases from the sun

Scientists have already managed to uncover some information, however, which may lead to breakthroughs in man's knowledge of the universe. The moon rocks are now known to contain particles from the sun, embedded in them in the form of gases. And these gases may provide us with the vital key to how the sun works and how