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# Vertex

THE MAGAZINE OF SCIENCE FICTION

**JOANNA RUSS**  
Examines  
The Image Of  
Women In  
Science Fiction

The Vertex  
Gallery  
Looks At  
**DESIGNS FOR  
OUTER SPACE**

**HEISENBERG  
IS DEAD!**  
says  
Richard  
Ashby

Vertex  
Interviews  
**PHILIP K.  
DICK**





## MOMENT IN HISTORY



## MONUMENT TO THE SEVEN

America's first spacemen were playing catch-up to the Soviet Cosmonauts, and they did their job with honor and distinction.

---

**ALAN B. SHEPARD**

---

**VIRGIL I. GRISSOM**

---

**JOHN A. GLENN, JR.**

---

**MALCOM S. CARPENTER**

---

**WALTER M. SCHIRRA**

---

**L. GORDON COOPER**

---

**DONALD K. SLAYTON**

---

Standing at the entrance to a side road on the swamp-flats of the Kennedy Spaceflight Center on Cape Canaveral is a monument, a piece of stainless steel sculpture, dedicated to the seven men who made up the Mercury Astronaut Corps, our original seven astronauts.

The monument was designed and built by General Dynamics Corporation of San Diego, and consists of the symbol for the planet Mercury, the number seven, and the cross of valor. A time capsule with a complete documentation of the Mercury Program was buried beneath the monument in November 1965, and it is to be opened in 2464.

The men the monument salutes are Alan B. Shepard, our first man in space who flew his Mercury capsule *Freedom 7* some 302 miles downrange on a ballistic flight which reached an altitude of 116 miles on May 5, 1961;

Virgil I. "Gus" Grissom, who also flew his ship the *Liberty Bell 7* on a ballistic path, covering 303 miles and reaching 118 miles high on July 21, 1961; John A. Glenn, Jr. who was the first American to orbit the earth, flying the *Friendship 7* for three orbits on February 20, 1962; Malcom S. "Scott" Carpenter, commander of the *Aurora 7* which also flew three orbits on May 24, 1962; Walter M. "Wally" Schirra who rode his *Sigma 7* Mercury spacecraft through 6 orbits on October 3, 1962; L. Gordon Cooper, our first endurance astronaut, who made 22 orbits around the Earth in his *Faith 7* capsule on May 15, 1963, and Donald K. "Deke" Slayton, who was grounded by a heart irregularity before he had a chance to fly in the Mercury Program, but who has now come back onto active astronaut status to fly the first of the combined Apollo-Soyuz, U.S.-U.S.S.R. missions in 1975. ○



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PHILIP K. DICK  
HARLAN ELLISON  
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HARRY HARRISON  
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FRANK HERBERT  
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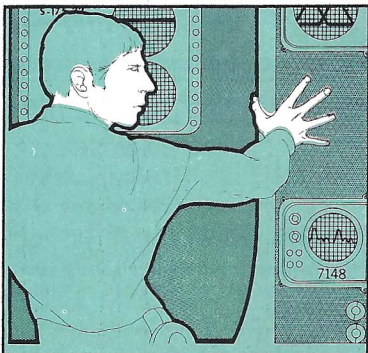
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 He had a job to do, and even though future generations might curse him for it, the job would be done.



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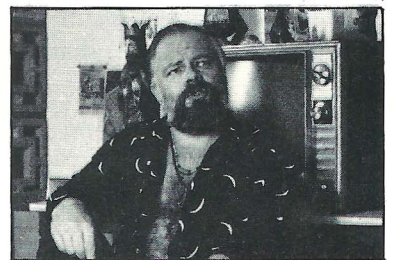
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DON DAVIS

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Recently — just prior to putting together this issue of Vertex, as a matter of fact—I attended a very strange affair in Toronto, Canada. Something called Torcon 2, subtitled the 31st Annual World Science Fiction Convention. I was, at various times, astounded, amused, aggravated, interested, irritated and inebriated. I met some of the people who have made science fiction great, and some of the people who have tried, consciously or otherwise, to keep it in the realm of “that Buck Rogers stuff.” I met people who were gracious and charming, and people who were boorish and boring. Strangely, at different times, they were sometimes the same people.

Even now, a month after the convention, my memories of it are more in the nature of vignettes than a cohesive whole, and most of those vignettes are somewhat contradictory. There are memories of listening to fans standing around praising to the skies the more progressive SF writers while damning the old-fashioned writers, then giving the Hugo Awards to the Old Masters. There’s a memory of walking down a Toronto street with Dr. Gregory Benford and Dr. Sid Coleman and being refused entrance to a restaurant because we didn’t have ties on. There’s the memory of fans and pros alike making remarks about the boorishness and bad taste of one of the speakers who presided over several official functions, then cheering that same person when he was awarded a Hugo and talking about what a great guy he was. There is the memory of the expression of Terry Carr’s face when his Hugo Award was announced, which completely destroyed any ideas I might have had about writing about the meaninglessness of such awards. There are memories of Vincenne Wallace, there with Bill Rotsler, who captured the hearts of all who met her. There are memories of fans complaining about “trekkies” turning science fiction into a kiddie hobby, then turning meeting after meeting into mini-Star Trek conventions. There’s the memory of Walt Liebscher taking a young fan around introducing him to authors and getting autographs for him, and the look on that young man’s face as he was introduced to people he would never have dared approach on his own. There’s the memory of the strange rule that said photographers only were allowed in the costuming room after the costume show to take pictures of the contestants. A good rule, but one that was sort of spoiled when photographer was defined as anyone with a camera — instamatic, polaroid or what-have-you. The real photographers didn’t stand a chance. Memories of the graciousness and just plain fun of Bob and Barbara Silverberg, especially Bob’s smile as he was constantly interrupted during a conversation to autograph books, a smile that was completely real. Memories of Sid Coleman, everyone’s perfect example of a staid, somewhat absent-minded professor, showing up at the banquet in the most moddish of purple suits. Memories of Greg Benford wandering around with two bottles of the world’s worst Burgundy, grown there in Canada, trying to get someone to help him drink it. And, most of all, memories of a lot of great people, the famous, the infamous, the would-be-famous, and the just-plain-folks, all of whom made it a great convention and all of whom make science fiction such a great field to be associated with, as both an editor and as that most maligned of creatures — a fan.

*Don Pfeil, Editor*



# NEWS & REVIEWS

News notes from the world of science and the arts—from space to the prehistoric past—From business contracts to book reviews—from ecology to spacecraft environmental systems.

## BLACK HOLE HITS EARTH?

The mysterious explosion of June 30, 1908, which flattened a large area in a Siberian forest, was a “black hole” that penetrated the earth as easily as a bullet passing through fog, according to two University of Texas scientists.

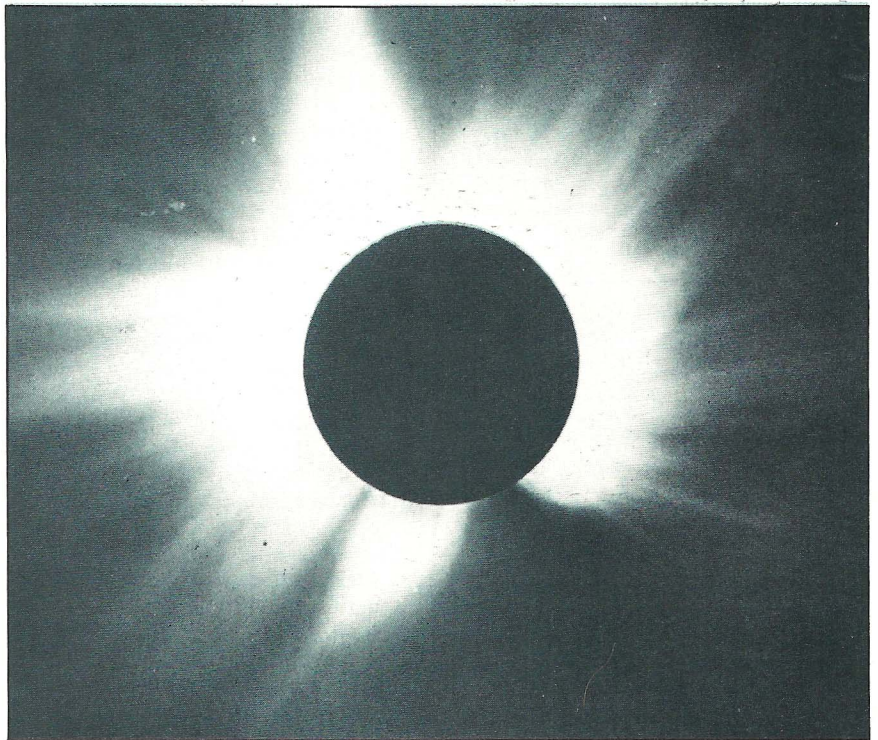
A black hole is a star which has collapsed into a super-dense cinder with enormously strong gravitational fields—so strong, in fact, that not even light can escape its clutches. If an observer could draw near a black hole in space, all he or she would see would be matter swirling into the center of nothing and then disappearing, like water going down an invisible drain.

Writing in the British scientific magazine *Nature*, A.A. Jackson IV and Michael P. Ryan of the Center for Relativity Theory on the Austin, Tex., campus, propose that it was a very small black hole—packing the thousand trillion-ton mass of a large asteroid into the volume of a speck of dust—that levelled the Tungus region more than 65 years ago.

Whatever it was, that big blast knocked down trees over a fan-shaped area 19 miles across and its force was felt by people as much as 30 to 50 miles away. But it left no crater or any fragments of a meteorite, if indeed that was what it was.

Scientists have speculated that the cause of the Tungus explosion might have been a meteorite which exploded while still hurtling through the atmosphere and which lashed the earth with a huge fireball.

Other less plausible explanations advanced have included a ball of antimatter which was annihilated upon contacting matter, and a nuclear explosion detonated by a civilization from somewhere else in the universe.



A black hole, according to the Texas researchers' theory, would have pushed a strong shock wave ahead of itself. It would have been this shock wave which flattened and scorched trees and even produced a blue flash. Some residents of the sparsely populated Tungus region reported seeing a flash at the time of the 1908 explosion.

“Since the black hole would leave no crater or material residue,” the Texas researchers wrote, “it explains the mystery of the Tungus event. It would enter the earth and the rigidity of the rock would allow no underground shock wave.”

Travelling at about 25,000 m.p.h., the black hole would have passed easily through the earth in a straight line, exiting somewhere in the North Atlantic Ocean between Newfoundland and the Azores. Jackson and Ryan are now

looking for the logs of ships in that area, at that time, for any unusual entries.

Despite its enormous mass and gravitational field, the black hole's infinitesimally small size would have allowed it to punch through the earth without capturing more than a handful of atoms from the earth, according to Douglas Eardley, a research fellow in physics at Caltech.

“If you have a black hole of the size they're postulated,” he said, “the physical effects would be about what was actually reported.”

But Eardley said that he and other physicists were skeptical that a black hole was involved in the Tungus event. He said that if such tiny black holes existed widely throughout the universe, then their disturbing effects should be more apparent—and they are not.



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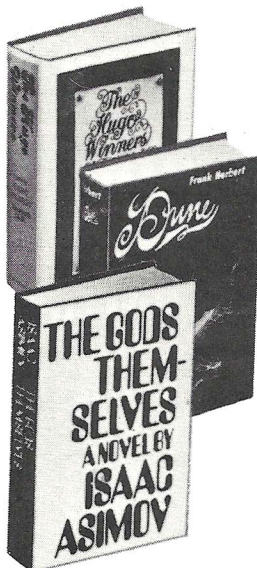
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## EUROPE TO BUILD SPACELAB FOR U.S. REUSABLE SPACE SHUTTLE

An unprecedented new international cooperative project is provided for in a Memorandum of Understanding signed in Washington recently by Dr. James C. Fletcher, NASA Administrator, and Dr. Alexander Hocker, Director General of the European Space Research Organization (ESRO).

Nine European countries, through ESRO, will design, develop, manufacture and deliver a "Spacelab" flight unit which will be an important element of NASA's Space Shuttle system. The Spacelab will have two elements, a pressurized manned laboratory module permitting scientists and engineers to work in a normal shirt-sleeve environment, and an instrument platform, or pallet, to support telescopes, antennae and other equipment requiring direct space exposure.

The Spacelab module and pallet will be transported, either separately or together, to and from orbit in the Orbiter payload bay, and will be attached to and supported by the Shuttle Orbiter throughout missions lasting seven to thirty days. At the end of each flight the Orbiter will make a runway landing, and the Spacelab will be removed and prepared for its next mission.

The NASA/ESRO agreement represents a major step in the sharing of space costs between the U.S. and European countries participating in this cooperative project. The estimated cost of \$300-400 million for the Spacelab will be borne by the ESRO countries involved.

The European Spacelab represents a significant contribution to the space transportation system in an area not funded by the U.S. It provides for the timely availability of a supporting system important to realizing the full potential of the Shuttle; it will also facilitate joint use programs, many entailing the activities of U.S. and European astronauts.

Under the terms of the Memorandum of Understanding, NASA will procure from ESRO any additional Spacelab units of the same basic design which may



be needed for U.S. programs. The U.S. will not develop any unit of its own which would substantially duplicate the design and capabilities of the first Spacelab.

It is currently planned that the first operational space flight of the Shuttle will occur in late 1979. To permit adequate time for experiment integration, check-out and compatibility testing, the Spacelab unit will be delivered about one year earlier.

Subsequent to the delivery of the Spacelab by ESRO, NASA will manage all operational activities, including crew training and flight operations. Flight crew opportunities will be provided in conjunction with flight projects sponsored by ESRO or by governments participating in the Spacelab program and utilizing the Spacelab. It is contemplated that there will be a European member of the flight crew of the first Spacelab crew.

While it is too early to define detailed terms and conditions for subsequent operation and use of the Shuttle with the Spacelab, NASA will make the Shuttle available for Spacelab missions on either a cooperative (non-cost) or a cost-reimbursable basis. In the latter case, the costs of the launching services provided would be charged as they are at present, for reimbursable launches of foreign

satellites.

The Memorandum of Understanding is subject to and implements a government-level Agreement between nine member states of ESRO and the United States.

Belgium, Denmark, France, Germany, Italy, The Netherlands, Spain, Switzerland, United Kingdom, and U.S. have signed the intergovernmental agreement. The agreement makes provision for participation by additional nations.

## "QUIET" SUN NOT SO QUIET

"We now have under way a new sort of transient event . . . a loop was formed in XUV (extreme ultraviolet) within the last 30 minutes," an excited Dr. Owen Garriott recently told Mission Control at the Johnson Space Center near Houston, Texas.

The "loop" that Astronaut Garriott had referred to was a magnetic field loop leaping from the surface of the Sun. Such hopes have never been observed in XUV through Earth-bound telescopes.

The loop observed by Garriott on an XUV Monitor appeared to extend about 1.5 ARC minutes across the solar disk. Such loops in the visible light wavelength are generally shaped like a gigantic half doughnut that would equal in length about one-sixth the distance from the Earth to the Moon.

The effect of the dramatic event on Garriott was such that he returned to the operation of his instruments later in the evening at a time when he was scheduled for sleep.

The instrument operation during a scheduled shut-down puzzled ground controllers until the next morning when they learned from Garriott that he had been more interested in his solar observations than he was in sleeping.

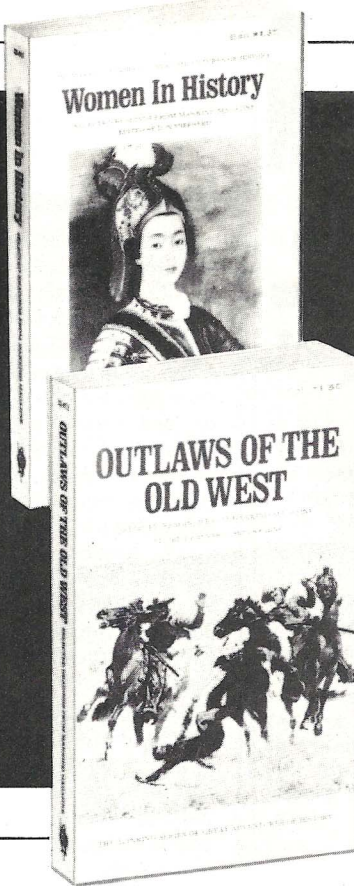
Skylab's XUV Monitor, and two larger instruments that are guided by the astronauts from visual references provided by the Monitor, are the latest innovations in a long line of ultraviolet wavelength electronic telescopes conceived by Dr. Richard Tousey, head of the Naval Research Laboratory's Rocket Spectroscopy Branch. The larger instruments are an Extreme Ultraviolet Spectroheliograph and an Ultraviolet Spectrograph.

Dr. Tousey was aware that observation of the Sun above Earth's atmosphere would vastly increase knowledge of the Sun's radiation spectrum. In 1941 he



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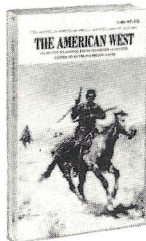
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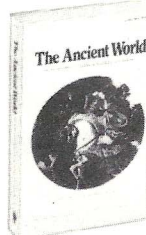
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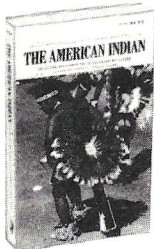
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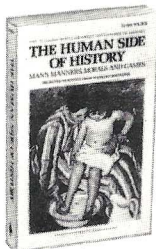
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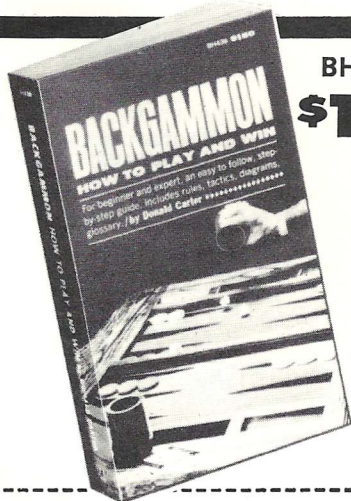
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proposed and flew the first rocket spectrograph, which photographed the Sun's previously hidden ultraviolet rays.

Tousey is the principal investigator for the data gleaned from the spectroheliograph and the spectrograph. These instruments are photographing the Sun in selected ultraviolet wavelengths.

But the instrument that alerted Gariotti to the dramatic emergence of the loop was the small XUV Monitor that was added to the Skylab's solar observatory by Tousey with the assistance of the Marshall Space Flight Center and Ball Brothers Research Corporation at Boulder, Colorado, early in the development of the Apollo Telescope Mount (atm) program.

The first Skylab crew operated the XUV Monitor but the men were unable to realize its value because the pictures that were flashed on their television monitor screens appeared and disappeared too quickly for their eyes to retain the images.

It was a different story for the people on the ground where data transmitted from the XUV Monitor television camera far exceeded most expectations.

After their initial use, photographs of these televised, filmed displays gradually began to be appreciated and then were depending upon for the planning of Skylab solar observation activities for following days.

The second Skylab crew carried a small photoelectric image tube into orbit. The image tube, supplied by the Army's Night Vision Laboratory, Fort Belvoir, Virginia, has a semi-persistent phosphor internal coating that causes an image to last long enough for the human eye to retain.

The astronauts also used a new SX-70 Polaroid camera aboard Skylab to photograph the XUV images. The Polaroid camera allowed them to compare the Sun's features from one orbit to the next.

After the light from the Sun passes through the optics of the XUV Monitor, it encounters three very thin aluminum filters. These aluminum filters pass extreme ultraviolet wavelengths that range between 171 and 500 angstroms while rejecting the more intense radiations emitted from the Sun in the longer wavelengths that include visible light. The aluminum filters are so thin that a stack of some 2,000 would approach the thickness of aluminum foil used in the kitchen.

The XUV then falls on a special phosphor placed on the front of the TV camera, which turns it into visible light to which the camera is sensitive. From that

point on, the system is a regular TV that produces an image for a astronaut monitoring and video transmission.

The XUV Monitor and the other solar observatory instruments in Skylab have shown many interesting and considerably different view of our Sun.

Although some scientists may prefer black and white photography, others are making use of electronics and color TV tubes to introduce artificial color into black and white photographs. This technique allows various shades of gray in the black and white photograph to be converted into very contrasting colors in the color photograph. It enables the untrained eye to easily distinguish features which would otherwise be almost invisible.

Solar physicists and astronomers sometimes describe the Sun as active or quiet. But research aboard Skylab has shown that even a quiet Sun is an extremely dynamic sphere. It is a busy furnace that supplies the quiet Earth with temperature conditions that maintain the fragile balance required by all known forms of life. The Sun is the Earth's source of energy. Skylab studies may someday provide the knowledge needed to better understand solar processes. Better understanding of solar processes may well lead the way to new means of generating and controlling energy for use on Earth.

## U.S. SCIENCE NO LONGER KING SAYS NATIONAL SCIENCE BOARD

Science and technology are alive and reasonably well in the United States.

That, in essence, is the National Science Board's hedged assessment of the health of American science today. In a recently published report called "Science Indicators 1972," the board—a part of the National Science Foundation—described for the first time a set of 68 different indexes which, hopefully, will show up the strengths and weaknesses of U.S. science and technology.

"Such indicators, updated annually," the report stated, "should provide an early warning of events and trends which might reduce the capacity of science—and subsequently technology—to meet the needs of the nation.

"The indicators should assist also in



# vertex

setting priorities for the enterprise (of science), in allocating resources for its functions, and in guiding it toward needed change and new opportunities."

The present list of indicators range from "research and development expenditures as a percent of gross national product" to "scientists and engineers engaged in research and development per 10,000 population" to "unemployment rates for scientists and engineers by age group."

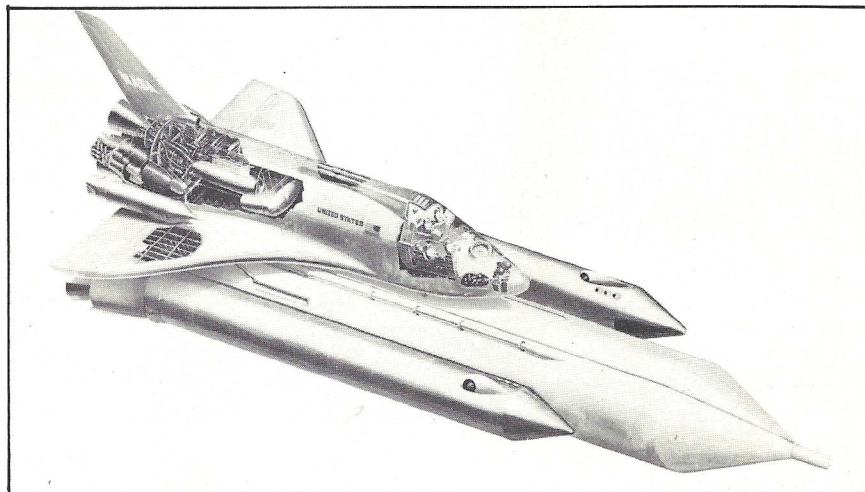
From beneath a crush of figures, charts and graphs, American science emerged as still strong, but showing signs of decline.

For example, the report noted that in seven of eight scientific areas, the United States produced more literature than any other major nation. U.S. scientists are

also cited more frequently by other scientists except in the fields of systematic biology and mathematics, where the British were ranked first.

But the proportion of its gross national product that the United States spent on research and development declined between 1963 and 1971, while the Soviet Union, West Germany and Japan were increasing their proportionate research and development outlays. And the number of scientists and engineers, per 10,000 population, also fell off in the United States after 1969, while increasing in the Soviet Union, Japan, West Germany and France.

The other indicators tended to show the same pattern. In short, the scientific establishments of the world are beginning to catch up with the United States.



## FIRST SPACE SHUTTLE ORBITER TEST ARTICLE NEARING COMPLETION

First major development test article in support of building the Space Shuttle orbiter is in the final stages of assembly at Rockwell International Corporation's Space Division.

The test assembly will simulate the orbiter's mid-fuselage section, which houses the spaceplane's huge 60-foot long, 15-foot diameter cargo bay. It will be used to verify, in advance of final design, analyses of such vital areas as mid-fuselage internal stress distribution and heat transfer, and the capabilities of the fuselage to accept moderately elevated temperatures.

•The U-shaped test article is 17½ feet wide and 20 feet long. It is made up of seven 17-foot-wide by 12-foot-high frame stations, which are enclosed by three major skin sections and supported

by 175 hat-shaped cross section stiffeners.

The full-scale test unit is being assembled in a new modular tool designed expressly for the orbiter program. Built primarily for assembly of the orbiter's aft fuselage, the tool's modular concept enables it to be easily configured for other components.

Space Shuttle is the first reusable space transportation system. About the size of medium-range jetliner, the shuttle orbiter will be able to transport as much as 65,000 pounds of payload to Earth orbit.

The shuttle will lift off from Earth like a rocket, fly in orbit as a spacecraft, and return to land on a runway similar to a jetliner.

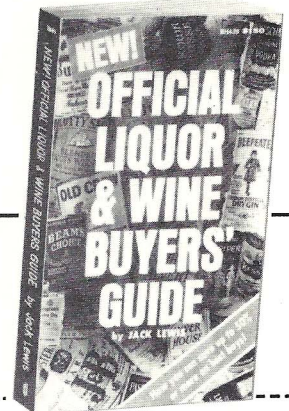
# NEW! OFFICIAL LIQUOR & WINE BUYERS' GUIDE

by Jack Lewis

Author Jack Lewis says that half of what we think we know about buying, drinking and serving liquor and wine is totally false, and the other half is questionable. But one thing is for sure: we're paying too much for what we think we're getting. This guide takes the mystery out of the alcoholic beverage mystique and defines clearly the jargon that has been fooling the public since prohibition. It will teach you the real difference between good and bad liquor—regardless of brand—and how to buy good liquor at the very best price. The Official Liquor and Wine Buyers' Guide is fun to read, an entertaining book and an indispensable reference that ought to be kept within easy reach. You owe it to your pocket book.

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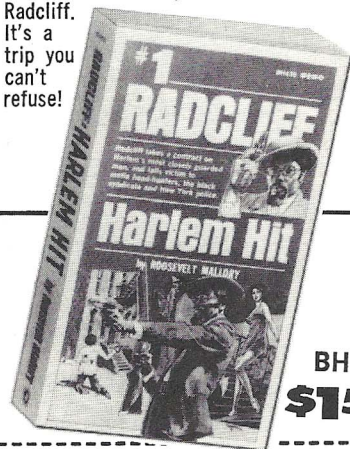
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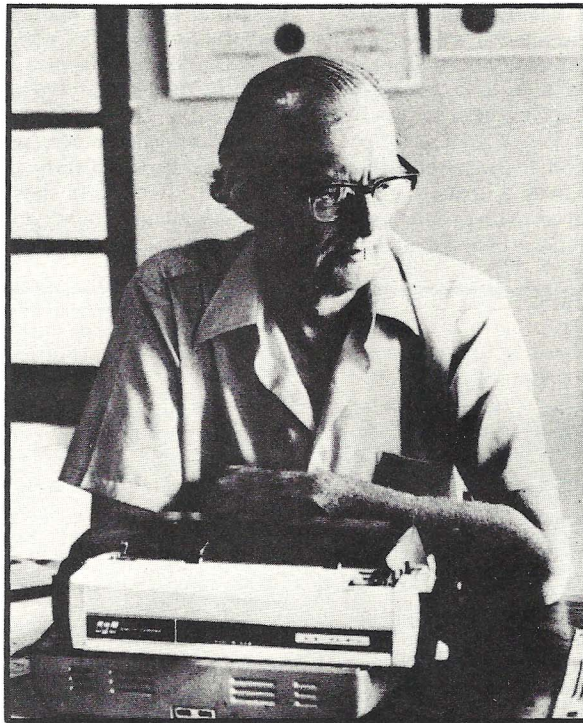
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## BOOK REVIEW



**Rendezvous With Rama, Harcourt Brace  
Jovanovich, Inc. 1973. \$6.95**

reviewed by James Sutherland

In case any SF readers haven't noticed, this has been a *very* good year. It began with the publication last winter of James Gunn's masterpiece, *The Listeners*, and the spring appearance of *Time Enough for Love* by Robert Heinlein, and now continues with *Rendezvous With Rama*, the first new novel by Arthur C. Clarke in half a decade. And as the ad-men would say, "it's worth all the waiting."

Like the Gunn and Heinlein books, *Rendezvous With Rama* is SF of what's come to be known as the "traditional" variety: a clear prose style, well-drawn characters, scientific accuracy and a solid, believable story. What distinguishes this novel from the others is the

intricate detailing of every point, from the special kind of fabric used in the construction of a forty-pound pedal-powered airplane, to the unusual sexual life of a spaceship Commander. Clarke's famed descriptive powers never falter.

The plot is deceptively simple. Over a century from now, an object thirty miles long is spotted approaching the solar system from deep space, and a preliminary survey proves that the intruder, code-named Rama, is artificial in origin. The governments of the various inhabited planets pool their resources and launch a crash project to intercept and explore Rama before it sweeps out toward the stars again. The spaceship *Endeavour* is diverted to Rama, and its crew soon finds a way to enter the vast structure and begins to discern its purpose.

Meanwhile, humanity becomes slightly unhinged over the continuing



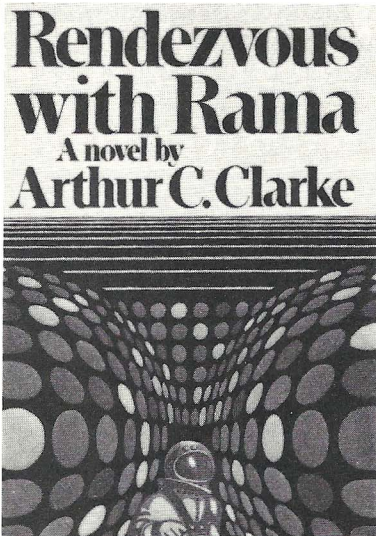
revelations reported back by the *Endeavour's* adventurous crew. Not a few want to leave Rama strictly to itself, some see it as an ancient religious prophecy coming true at last, and the highly-industrialized natives of Mercury see Rama as a threat and set in motion a plan to destroy the alien.

Commander William Norton of the *Endeavour* eventually resolves that problem, and comes to understand the very peculiar nature of Rama and its unseen but omnipresent creators. Clarke concludes his narrative with a surprise ending that is both logical and ego-humbling—and optimistic about future encounters between humans and extraterrestrials.

This may signal a change in attitude for Clarke. In recent years he has become increasingly pessimistic about mankind's eventual fate, a dark vision culminating in the film and novel *2001: A Space Odyssey*, with its zombie-like astronauts and the malevolent computer, HAL 9000. With *Rendezvous With Rama*, Clarke appears to be returning to the tone of his earlier novels, which saw people and technology together working toward a common goal of fulfillment.

The crew of the *Endeavour* have little of the uneasy fear of machines that pervaded the thoughts of the two men aboard the *Discovery* in *2001*. They neither dread or revere the technology that surrounds them completely all through the novel, instead they regard devices, even ones as awe-inspiring as Rama, as tools to use to explore, contemplate, or wonder about the Universe.

These are competent professional men



and women, a rare breed these days, and Clarke is clearly fascinated by people who can do things correctly. And yet, he takes special delight in catching his superbly able crewmembers in off-moments of uncritical joy and pure wonderment, describing their thoughts as they slide down a mile-long bannister on the seats of their pants, or wandering the stacks of an alien library. One character ponders the effect on the male mind of bra-lessness in a zero-g environment; later on in the book another astronaut, in the middle of sabotaging a 1000-megaton hydrogen bomb, takes time to note the manufacturer's address etched on the bomb casing before going on with his work. The head of a committee that will decide the fate of Rama and the *Endeavour* recalls that another committee member, "Conrad Taylor, the celebrated anthropologist . . . , made his reputation by uniquely combining scholarship and eroticism in his study of puberty rites in late-twentieth-century Beverly Hills."

Clarke also is adept at constructing a plausible future world unobtrusively, dropping in bits of convincing detail throughout his novel in the manner pioneered by Robert Heinlein. He suggests that the Mediterranean will be drained for the benefit of archeologists, that spacemen will be sterilized, but still have children of their own, and multi-mariages on several planets may be the best antidote to the loneliness of constant interplanetary traveling. The Earth and inhabited worlds of the year 2130, Clarke believes, will be somewhat strange places, from our own vantage point, but the continuity of human life as we recognize it will remain unbroken into the future.

This theme is central to most of Clarke's writing, starting with his first novel, *Prelude to Space*, and advancing through successive books like *Earthlight*, *The Sands of Mars*, and *A Fall of Moon-dust*. Each fits into a common framework describing an imagined future of which *Rendezvous With Rama* is one part; Clarke announced that two more novels will carry his personal vision forward to culminate in an immense galactic civilization. Amid that dazzling setting, the long cycle of history set in motion by the events described in *Rendezvous With Rama* will reach its climax.

Most certainly, that will be worth the waiting, too. But don't miss this first volume in the interim. *Rendezvous With Rama* is a special book, even in a very good year. ○

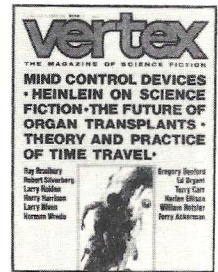
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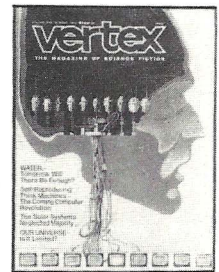
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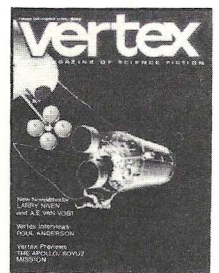
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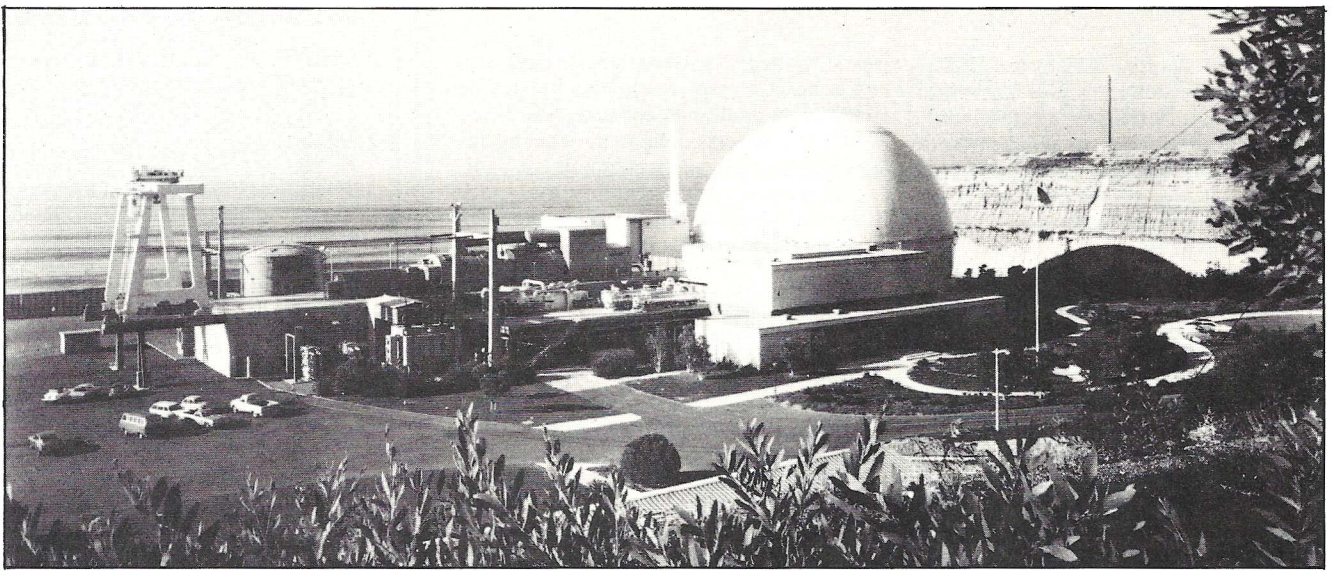
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## FOREIGN REACTOR WASTES BEING STORED IN U.S.

Deadly radioactive waste products from American-built nuclear reactors in foreign countries are being imported into the United States in spite of the fact that this country has serious problems in storing its own radioactive wastes.

While an Atomic Energy Commission official said the quantity of imported nuclear waste is relatively small, it is growing.

And it appears that the United States is well on its way to becoming the radioactive dumping ground for much of the world.

At the same time, U.S. Atomic Energy Commission officials concede that the United States has not solved its own problems of waste disposal. The 30-year history of the Nuclear Age is replete with serious shortcomings in the management of radioactive waste products in this

country.

However, radioactive waste products already are in storage here from Japan, Canada and Italy, and many other countries will soon join that list.

American-made nuclear power plants are going into service in many countries. The American firms which build the reactors also hold contracts for reprocessing the fuel, the source for nearly all of the lethal radioactive waste products generated by nuclear reactors.

The fuel rods must be returned to the United States for reprocessing and the waste remains here.

Over the years American industry moved to the forefront in the promotion of nuclear power. Today, companies like General Electric and Westinghouse build nuclear reactors for foreign countries around the world.

But as Dr. Frank Pittman, AEC director of waste management, has said, more money is to be made in the fuel than in the reactors themselves.

"General Electric produces fuel for reactors they have sold around the world," Pittman said.

The sales contracts require the buyer to purchase fuel from GE, Pittman said.

That means that the fuel rods from the reactors must be removed from time to time and shipped back to the GE reprocessing center in Morris, Ill. Reusable uranium and other saleable radioisotopes are extracted from the fuel rods, leaving considerable amounts of deadly radioactive waste.

Those waste products will remain in this country under what the AEC calls "perpetual care."

Pittman said he does not consider the

## SOVIET TEAM AT JSC FOR TESTS OF APOLLO-SOYUZ DOCKING EQUIPMENT

Ten scientists and engineers from the Soviet Union have begun an extended stay at the Johnson Space Center, where they will work with U.S. engineers to evaluate the docking system to be used in the Apollo-Soyuz Test Project.

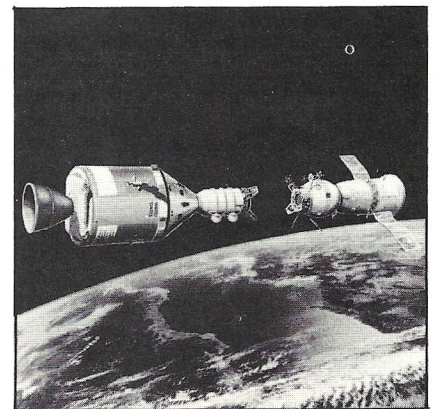
The Soviet team is headed by Vladimir S. Syromyatnikov, Senior Researcher of the Soviet State Research Institute on Machine Building.

The full-scale development hardware built by the two nations is now at JSC for an extensive series of tests as to its compatibility and operation. The docking module will be used in the Apollo-Soyuz joint mission scheduled for July

1975.

First in the planned sequence of tests will be an evaluation of the two sections, one prepared by each nation, for proper mating. Following this, pressure integrity and structural strength of the combined system will be checked.

The U.S.-U.S.S.R. team will also make dynamic tests of the actual docking of the two elements. Each of the components will perform the active docking maneuver with the other element as a target. Other tests include a study of the system under thermal extremes expected in space. The entire sequence of tests could take up to three months.





## ARTIFICIAL HEART RISKS

The long quest to construct an implantable artificial heart, drawing steadily closer to realization, raises a disturbing number of questions, a panel of scientists has warned the government.

The scientists said that the moral, ethical, legal and social questions some of which have the potential for emotion-charged controversy, should be resolved before the artificial organ is made available to the estimated 50,000 people whose lives it might save each year.

The institute is spending about \$5.7 million this year on artificial heart and related research and has put at least \$36 million into the project since its inception. The Atomic Energy Commission is spending \$2.2 million this year and has spent a total of more than \$9 million since 1967.

### Now Being Tested

A totally implantable artificial heart is now being tested in animals. The report said it might be as long as 10 years before such a device is generally available to the public, but that limited human experimentation may be much closer.

"We believe that development of the totally implantable artificial heart should

problem of foreign waste significant because it will not add appreciably to the waste generated by this country.

### Amount of Fuel

He added that economics will force some countries to build their own reprocessing facilities rather than transport the material all the way back to the United States.

However, AEC documents indicate that the amount of fuel for foreign reactors that will be processed in this country may be very substantial in the years ahead.

In its annual reports on the nuclear industry in recent years, the AEC has projected that "foreign free world requirements" for fuel will nearly equal domestic requirements by 1985. The reports indicate that more than 60% of that requirement will probably be met by U.S. processing plants in 1985.

The reports also show that in dollar values the export of nuclear fuel material and isotopes exceeded the value of exported reactors and instruments as early as 1969.

As Pittman said: "The money in the long term is in the fuel."

proceed," the 10 lawyers, doctors, sociologists, ethicists and political scientists said.

But they listed a series of issues that must be resolved including:

—Cost. at \$25,000 a patient, the artificial heart will strain current health-care financial systems. Unless financial support is made available to all who need the artificial organ, it may become a life-saving device accessible only to the rich.

### Organ Shortages

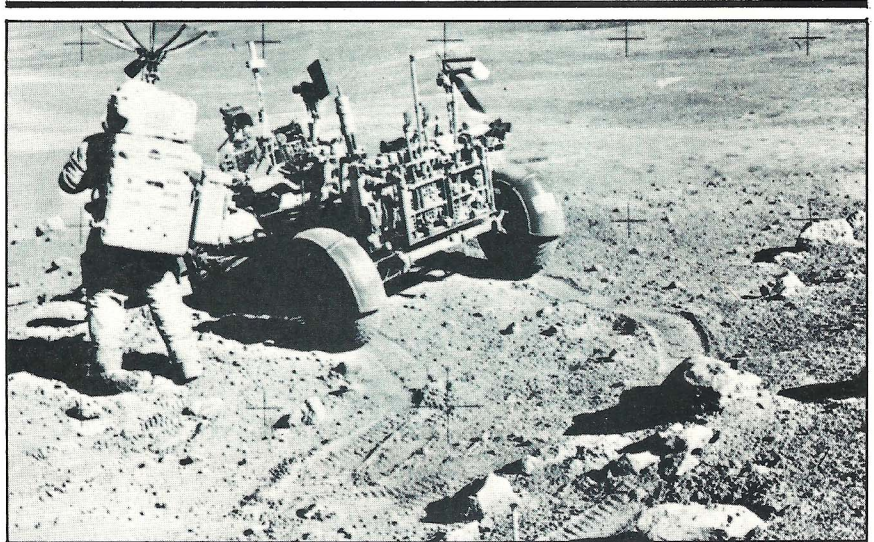
—Selection of recipients. Once the organ becomes clinically available, it is unlikely there will be enough hearts, implantable teams or medical centers immediately to accommodate everyone who would die otherwise. Selection should be made on a medical basis only, resorting to lottery in case of shortages for patients with equally dire medical situations. In no case, the panel urged,

should patients be selected on the basis of "social worth."

—The definition of death. Doctors cannot determine the point of death for persons with a mechanical pump that can continue circulating blood after other organs have died, the panel said.

Both battery and nuclear power sources that would be implanted in the body to run the heart are under development. The panel was particularly critical of the nuclear power source, citing biological and environmental dangers from the nearly two ounces of highly radioactive plutonium required to supply the energy.

"The panel recommends that the nuclear-powered artificial heart not be implanted in human beings until such time as it is established scientifically that there will be no significant risk or injury involuntarily imposed on other persons," the report said.



*Apollo 16 Commander John Young represented his crew at the FIA awards, where they received the V.M. Komarov Diploma for crew achievement.*

## FAI HONORS APOLLO ASTRONAUTS

Astronauts Eugene A. Cernan and John W. Young received the two highest awards of the Federation Aeronautique Internationale September 3, in Dublin, Ireland. The Apollo 16 crew was also honored.

The FAI Gold Space Medal for 1972 was presented to Cernan for "outstanding performance as commander of Apollo 17." It is the federation's highest award for space flight.

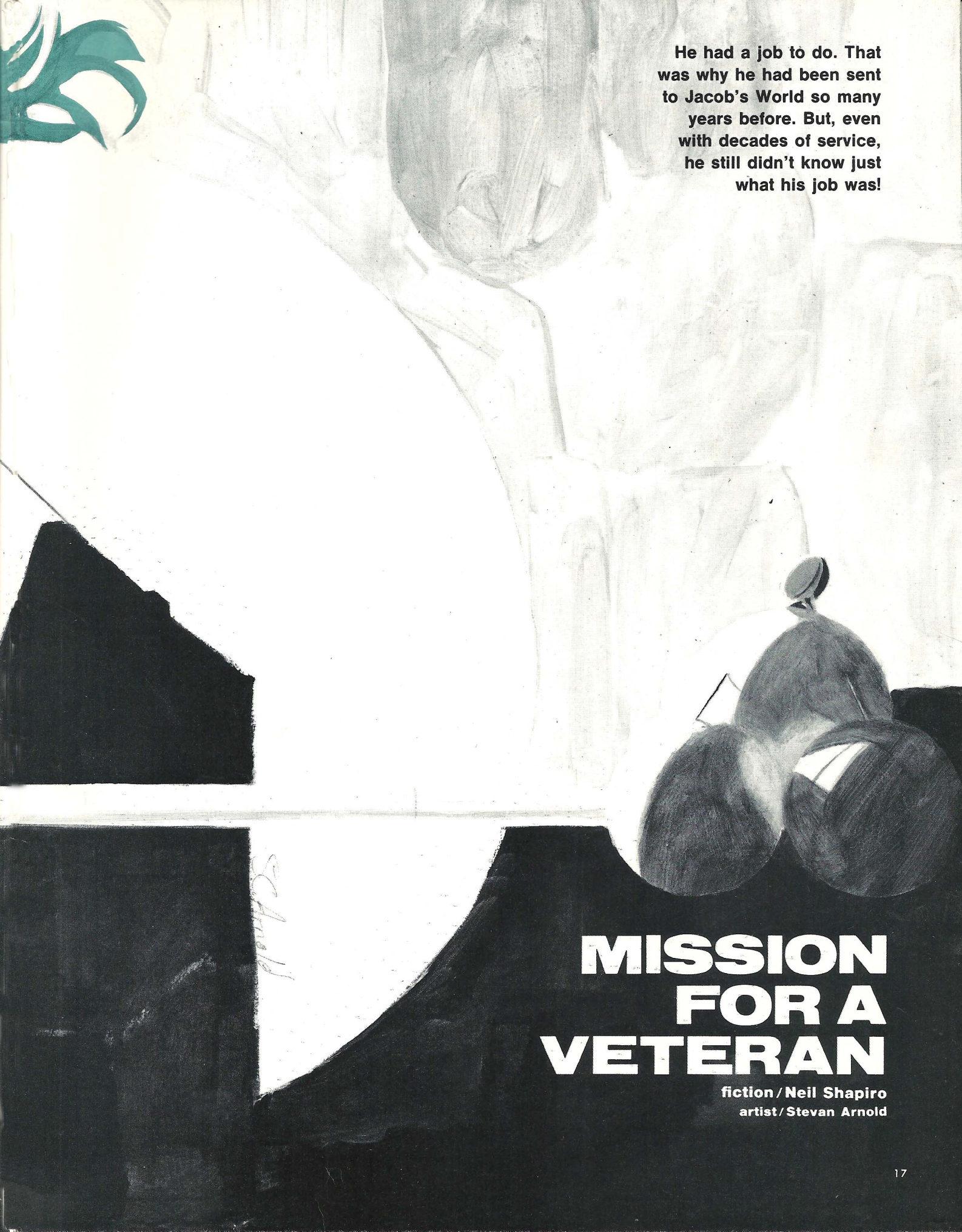
Young, Apollo 16 commander, received the Yuri Gagarin Gold Medal for 1972, the second highest award. In addition, he represented fellow crewmen Astronauts Charles M. Duke, Jr., and Thomas K. Mattingly II, in accepting the V.M. Komarov Diploma, the only FAI space award which recognizes achievement by a crew rather than an individual.

The FAI is a worldwide federation dedicated to progress in aviation and space flight. It is the official keeper of records in those fields. The Dublin meeting is its 66th annual general conference.









He had a job to do. That was why he had been sent to Jacob's World so many years before. But, even with decades of service, he still didn't know just what his job was!

**MISSION  
FOR A  
VETERAN**

fiction / Neil Shapiro  
artist / Stevan Arnold





***A planet died, and with  
it died his dreams of  
the future. Now all  
he had was his job,  
his few friends, and  
his dreams of the past.***

It was the same type of dream, a part of the same series of bloody nightmares that had been in constant repetition within his mind for over a year now. Every night, like an obscene symphony, the notes of terror reverberated throughout his sleep.

They were dreams but they were also memories; they were reality, revisited by night.

This dream, this sleeping recollection, was concerned with the colony world of Altane. In the dream, Altane hung like a fire-blackened ornament on a field of diamond speckled velvet. Those bright pinpoints that were the stars only served to accentuate the black deathfulness of the Altane globe. Like a silent monument to an unnamed death-goddess, the sphere that had been the living world of Altane spun about its uncaring sun.

Once again, the dreamer was a young Ensign who stood on the bridge of his first ship, with the memories of his first and now dead love like a mist before his eyes.

He could see her, Mirane, dancing in the ashes of her world. The reflected flames were orange brightnesses within her eyes as she whirled toward the one place he could not reach her.

She danced, she danced, she danced, and the dead sang a melodious dirge.

Altane hung before him like a haunt-



ing sphere of accusation. Roughened edges of its dead continents glowed dully, feebly illuminating the boiled rock of its seabeds.

"I'll return," he had promised Mirane, and he had. But he had returned days, many days, too late.

She stood beside him on the cold, gray metal of the deck, a gentle apparition whose eyes no longer held room for love but overflowed with a world's regrets. He reached out for her.

He reached for her with the arm he no longer had and, in his sleep, he cried out with pain as the skin of his love burned like molten sand.

She laughed at him as he burned and she danced the death dance of Altane. There was nothing left for him but the pain of his burning dream.

So he screamed, as he screamed nearly every night, and he awoke once more to an old man's dawn.

The sunlight that streamed in through his window was an unshaded glare of harsh and present reality. He didn't dwell on the dream itself, for he had no need of that. He had often recalled those memories.

Though he was alone and no one could have heard him cry out he couldn't help the feeling of foolishness which came on him. But tied to the shame at the reaction he had shown to—of all things—a nightmare, there was also a worry that perhaps his actions augured something more. Though the colony's doctor had not mentioned nightmares, and the terrible reaction to them, as symptoms, it seemed possible that his recent sickness might have something to do with the repetitiveness of the dreams.

Of course, it could be only age.

For a few moments he debated the possibility of staying in bed. After all, the old do have certain prerogatives, that of taking bed rest while the young are forced into being up and about being perhaps the most prized of all. But even that was denied him, for today was Pension Day. There were the usual speeches to look forward to, and the same questions as there were every year. Of course, once more, he'd be expected to come up with original and character revealing replies.

He felt that he might not get through the day. But then he had felt that way every year on Galactic Pensioners' Day of Recompense. But last year and the year before, and the year before that, there hadn't been the nightmares or the other things as well.

There had not been the sickness. Age alone he had always felt himself able

to cope with. But age had now joined forces with its oldest ally and he knew that soon he would no longer be able to hold against them both. But that, even that alone, might not have thrown him as deeply into the depression he felt.

The times, though, the temper of the society about him had seemed to sour. Every day brought forth a new and more outspoken orator, each with new words and an old message. He could not bring himself to understand the issues they spoke of, but he knew that life itself—thanks to them—was becoming a personal and very private version of Hell.

But it was Pension Day. He would have to get out of bed.

For at least the thousandth time he wondered, with this year a new fervor, why they couldn't just mail him the few paltry credits which might, just possibly, sustain him for another year. Providing, he added, that he even had another year.

He rose and was angered, as he had been every morning since the action in Battle Segment One nearly twenty years ago, that he had but one arm to use as leverage.

It was late. He would have to hurry. It wouldn't do, he thought, to keep them all waiting. They deserved his promptness, he supposed. After all, the Day was his one contribution to the colony here on Jacob's World. Even at that it was a small contribution, an insignificant one according to some of the orators of Colony Square, worse than small to many of the others. He wondered if any of those would be there today. He had been promised there wouldn't be. But, in the past, he had been promised other things as well. Sometimes, he thought, life can be viewed as one promise following another, a parade of disappointments.

But then, he reminded himself as he finished his dressing, no one had ever told him that life would be anything else. He examined himself carefully in the mirror, still minded as he was to look his best for this yearly Day.

He saw an old man in the faded uniform of a Galactic Fleet Captain, the right sleeve of which was folded neatly and tightly up against a wizened shoulder. On that shoulder he wore the twin sunbursts of Bravery and Excellence, but that too was tarnished and worn. Nowhere could he see a trace of the young Ensign who one day, long ago, had dreamed of a final dance with the ghost of his first and final love. He could see only an old man who remembered and relived the dream.

Then, very gently, he lifted a small transceiver from out of the drawer where

it had been carefully cushioned and locked away. Almost lovingly, he clipped the transceiver tightly to his belt. Though small it was functional. It provided him with his last connection to the Fleet. And, through him, it also protected Jacob's World. Though there were now some, more so than ever before, who would deny that they needed that protection.

He smiled for the first time that day, perhaps for the first time in many days. The transceiver would be used that afternoon. It was Pension Day and, more importantly to him, it was time for his yearly report.

He wondered which ship would answer today's call and whether or not it would be one he had once commanded. Last year, it had been the mighty *Antares* which had logged his report. Not this year, though. Now the *Antares* was a cloud of gases, dissipating even its memory into space.

His thoughts were interrupted by the soft, but insistent chiming of the doorways sensors.

He answered quickly, surprised that Kevin had already arrived. It was even later than he had thought. But, as he had given his little talk and answered the unvarying questions so many times before, he had little need for any time to spend in preparation.

"Morning, Captain Yost," Kevin said, respectfully. "My father wonders if you're ready?"

"And," Yost answered, "when have I not been?" But he smiled and the boy, who probably knew Yost better than any other member of the colony, knew the old man's simulated anger for what it was.

"You should see the crowd," Kevin said, "even bigger than it was last year. I'd say that everyone in the colony must be there. Matter of fact," the boy laughed, "I didn't know that the colony was quite so large."

Yost placed his arm about the young man's shoulder. "Still," he replied, "I would wager, Kevin, that not that many have come to cheer."

"No, Sir," Kevin said, his forced laughter leaving him, "I suppose not. But then what do they know, anyway?"

"They may know more than I can give them credit for, Kevin. I guess it's hard for me to say, one way or the other."

"Well," Kevin answered with great sureness, "it's not hard for me to say. I say that it was a lucky day when you chose to come to Jacob's World and to



settle here. And, as for the Pension, you deserve it. So do all the other veterans, no matter to what worlds they've gone." Kevin glanced at the Captain's empty right sleeve and, yet more quickly, looked away again. "You're earned it," he said. "God knows you have."

"What God may know and what he doesn't," Yost said dryly, "still won't pay the Pension Tax of all those fine people."

Kevin was somber now and Yost momentarily regretted the old man impulses which had made him bare his depressed mood to the boy.

"We'd better go," he said brusquely. "After all, how long can we expect your father to talk?"

"Long enough, would be my estimate," Kevin said. "He didn't get to be Colony Mayor by not being able to talk forever, you know."

"I suppose *that's* true enough." Yost laughed and was surprised to feel it as true laughter. "If nothing else, I guess we can count on that."

Kevin led their way to the groundcar parked outside. The sides of the vehicle were festooned with gay, colorful banners and bunting. It appeared as if the national colors of all the Thousand Worlds of Federation fought for space on the sides of the small official car.

It was a short drive to the Colony Square but it was long enough for a memory, long enough for an old man's dreams, and long enough for a warrior's regrets.

Mirane. Mirane. He wondered if he had once been meant to die with her and, if he had done so, whether it would have mattered to any but himself. But he had arrived a short week too late for that, she and Altane had both already been destroyed. A short week that might as well have been forever.

He had grown up on Altane and he had grown to love Mirane. Why though had he enlisted? Mirane had never understood that, for that matter it remained a mystery to himself as well.

He had been the first recruit to have come from the planet of Altane in thirty years, and for eighty years before that.

It only takes five men, and a million myriad computers to run a star cruiser. While the Galactic Fleet needed men, they never needed all that many. With the more than a thousand worlds of the Federation to recruit from, maximum fleet strength being to the order of ten thousand men, many worlds were hardly ever tapped for manpower. It is true that some worlds did send many men, sometimes as many as a hundred within a decade. But the corollary of that was

simply that the majority of the Federated worlds found recruits a scarce, almost unknown, rarity. It all tended toward making the long fought war seem far away and unreal.

One thing that made the war more pressing to the worlds of the Federation was the taxes which went into the support of the war effort. Most of these taxes went into armaments for the Fleet, which was an eminently reasonable use. The defensive and offensive state of the weaponry of the war made it an impossibility to defend a world solely from the ground. So the federated peoples had to rely heavily on how well equipped was their Galactic Fleet against the constant alien threat. A small part of this tax was set aside and was used as a Pensioners' Fund.

All of that seemed rational enough, but why did anyone enlist? He couldn't explain it to Mirane when she had still lived and, he found, he still could not satisfactorily explain it to himself.

Mirane. She had been a lovely girl.

Mirane. His dream of her dancing in the ashes of her world, her ghost, it haunted him still.

"Sir?" Once more Kevin's words interrupted his reveries. "May I give you a hand to the podium from the car?"

"No, thank you." Yost replied, dignified as he felt the occasion warranted, "I'll manage. Don't worry, boy. I've been feeling much better these past few weeks." Much better, he thought, that was the truth of it. The sickness was eating him away inside and a different sickness was attacking him from without. But to say that he was feeling better was, in a way, the truth. For he no longer cared and that made the pains so much easier to bear.

The bubbletop of the groundcar slid back and Yost found himself immediately plunged into a maelstrom of noise and activity as the crowd gathered in Colony Square pressed closely about the car.

"Here, now." Mayor Javes, Kevin's father called in amplified tones to the crowd. "Clear a way for the Captain. Please. Come now, let him through."

Yet, under all the noise, there was a different undercurrent this year which even the Mayor's amplified calmness could not hide from the Captain's ears. As was usual, a cheer went up for him as Yost left the car, but it seemed that other things were shouted as well.

Probably imagining things, he thought, an old man's fantasies of persecution. All hail the conquering hero. They all do. Every year.

The crowd parted before him, slowly clearing an open pathway to the podium. As he arrived, Mayor Javes, a rather portly and balding figure, came trotting down from the lectern.

"Well. Well, Captain," he pumped Yost's left hand as if he had never even noticed the absence of the right one, "I'm glad to see you're feeling better. Feared that there might not be a celebration after all. Should have known you wouldn't let that happen!"

"Let's just say," Yost replied, "that I had little better to do, Your Honor."

"Always joking, I see." Mayor Javes's round face wore a slightly discomfited, but not surprised, expression. "Well, I say that's good. One never knows when they might need a good sense of humor."

"Or any sense for that matter, one supposes." Yost immediately regretted his reply. Mayor Javes and his family, most especially Kevin, were among the very few who had stuck steadfastly to their support of him during the recent troubles. Most people disagreed with the speechmakers, but Mayor Javes had—more than once—placed his political life on the line for him. "I'm sorry, Mayor," Yost apologized, "but I just want to get this over with."

He allowed the Mayor to lead him to his seat behind the lectern. There would be a few more people to speak before him. The noise from the crowd had dimmed to a lower ebb of sussurant whispers, comments and coughings.

Yost hardly heard them, he was miles away. In fact, he was lightyears away, far, and far away. These days, it seemed to him, his dreams no longer had even the decency to wait for night. Even the sunlight no longer guarded him.

Mirane.

Why did his thoughts today insist on returning to her?

It had been so long ago. So far distant in both space and time. But, he thought, perhaps it's because I'm now reaching the end of this life and there are so few things worth remembering about the beginnings. But that was a depressing thought. It was best not to question it, he concluded, it was better to allow his mind to lead him where it would. . . .

To Mirane.

In the very midst of the Aldebaran crisis, the Fleet had received the distress call from Altane.

In all of the long history of the war, the two opposing fleets had met in combat only nine times. The usual practice was that the positioning of one

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article  
James Sutherland

Man's first and, for now, last steps upon the moon are by no means the end of his exploration of the solar system. But, also for now, it will be man's machines, rather than man, who will be doing the exploring.

# THE UNHUMAN EXPLORERS



The age of manned space exploration that began so brilliantly almost 13 years ago with the triumphant flight of Yuri Gagarin in Vostok 1 is over. With the final Apollo trip already a year old and Skylab completed, only a few sporadic manned exploratory voyages are scheduled before 2000. But as one age concludes, another commences. The remainder of this century in space will be the age of the robot explorer.

This could be a cause of needless apprehension in some minds, for the word *robot* has acquired a fairly unsavory connotation in its short lifetime, courtesy of the movies. According to Hollywood, a robot is a clanking contraption resembling a giant talking jukebox, complete with the alarming tendency to run amok and start lurching off with the hero's attractive girlfriend tucked under one tubular-steel arm. Contrasting that image with the reality embodied in current unmanned spaceprobes—cooly efficient devices possessing a shimmering, Kandinsky-like beauty—vividly demonstrates the maturity of the new breed of space machines over their shambling sci-fi forerunners.

Yet both share a common line of thought. They were conceived as substitutes for human beings and designed to perform missions too dangerous, tedious or expensive to allow people to make. It is this kind of reasoning, for instance, that has sent the unmanned spaceprobe Pioneer 10 along a 620,000,000 mile flight to the planet Jupiter for a short reconnaissance, then to be hurled completely out of the Solar System and into the galaxy itself, never to return to Earth. Clearly, this sort of voyage is suitable only for a machine intelligence, which not once needs sleep or water or food, which never gets bored or lonely or anxious about its ultimate fate.

The concept of non-manned space exploration is nearly as old as the idea of spaceflight itself. It was first seriously considered by the American physicist and inventor, Robert Hutchings Goddard, just after the end of World War One. Goddard realized that sending men into space would be a horribly expensive, risky and time-consuming business, and suggested launching self-directed machines first. In his now-famous Smithsonian paper, *A Method Of Reaching Extreme Altitudes*, he proposed firing an explosive-tipped rocket to the Moon; on landing, the charge would mark the site and provide some otherwise unobtainable information on the nature of the lunar crust. This quite modest project (at the time engineers

were contemplating a tunnel beneath the English Channel and transatlantic Zep-pelin passenger traffic!) was greeted with almost universal derision on two counts. *Everybody* knew that rockets wouldn't function in airless space, and even if they could a pilot had to be aboard to steer.

Goddard was totally vindicated on September 13, 1959 when the Soviet robot probe Luna 2 crashed onto the Mare Imbrium, becoming the first man-made object to reach another world. It would be more than another decade before men would follow.

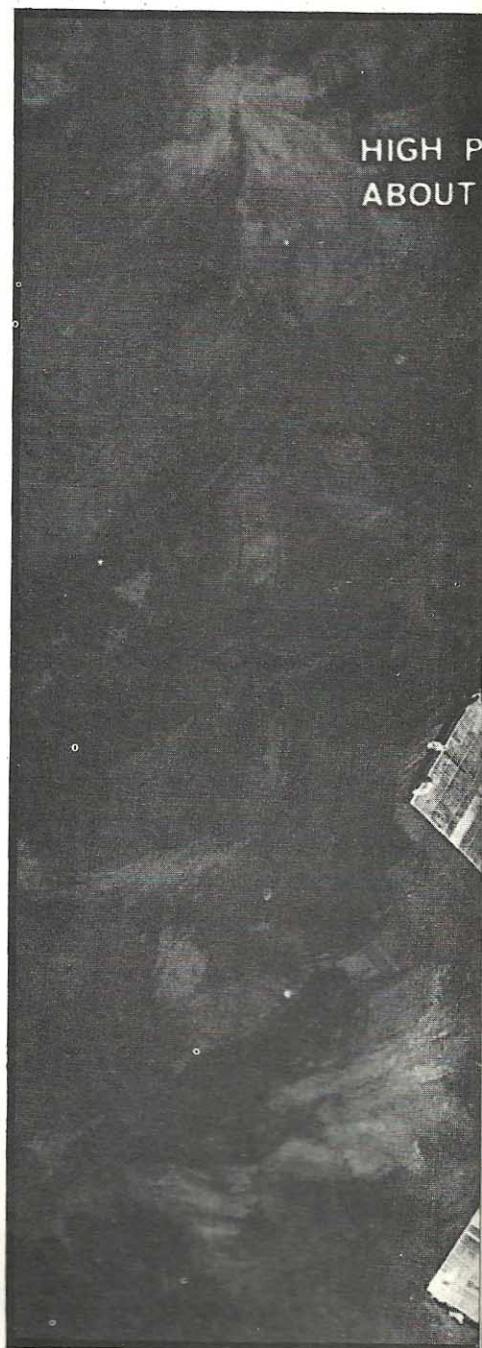
Of course, there were vast differences in sophistication between Goddard's crude flashpowder-signal rocket and the radio-equipped spaceprobe, but the basic principles remained fundamentally unaltered. In fact, all unmanned space explorers are designed around a few simple engineering and scientific concepts, many of them centuries old in theory and practice.

First and most obvious, naturally, is the rocket that serves to boost the probe away from Earth and on its way. The launch vehicles now most often used are retired war rockets such as the Atlas, Thor and Titan with additional stages added to increase payload and velocity. Pioneer 10 got its initial lift from an old Atlas missile modified to carry a lightweight but extremely powerful second stage named the Centaur, which in turn thrust the probe from Earth at a record 39,000 miles an hour.

Even so, the vast distance separating Earth's orbit from that of Jupiter is such that the probe has drifted along its course for over a year and a half. A comparable shot to Saturn might be twice that figure—and flights to the outermost planets; Uranus, Neptune and Pluto, stretch into the decades. These very long transit times are a disadvantage in several ways. On long coasting flights, the spacecraft is more likely to encounter micrometeoroids and other space debris, it is more apt to develop internal difficulties, and costs more to track.

Aerospace engineers have devised two ways to shorten voyage times. One method is the so-called *gravity slingshot* technique, whereby the gravitational field of a planet is used to alter the course of the probe to any desired degree and then to accelerate it off in its new direction. In effect, the probe *steals* a tiny fraction of the orbital speed of the planet and adds it to its own. In this manner a flight from Earth to Pluto that might require upwards of *fifty years*

**The Mariner 9 orbit, inclined 65 degrees to the Mars equator, provided a 70 percent coverage of the planet's surface by Mariner's instruments over a 90 day period and also allows for long range studies of Martian weather and seasons.**





of free coasting can be done in just eleven if the fields of Jupiter, Saturn and Uranus are utilized correctly. That involves waiting for the planets to line themselves up in a particular arrangement so the probe can carrom off one to another in the smallest time and highest speed.

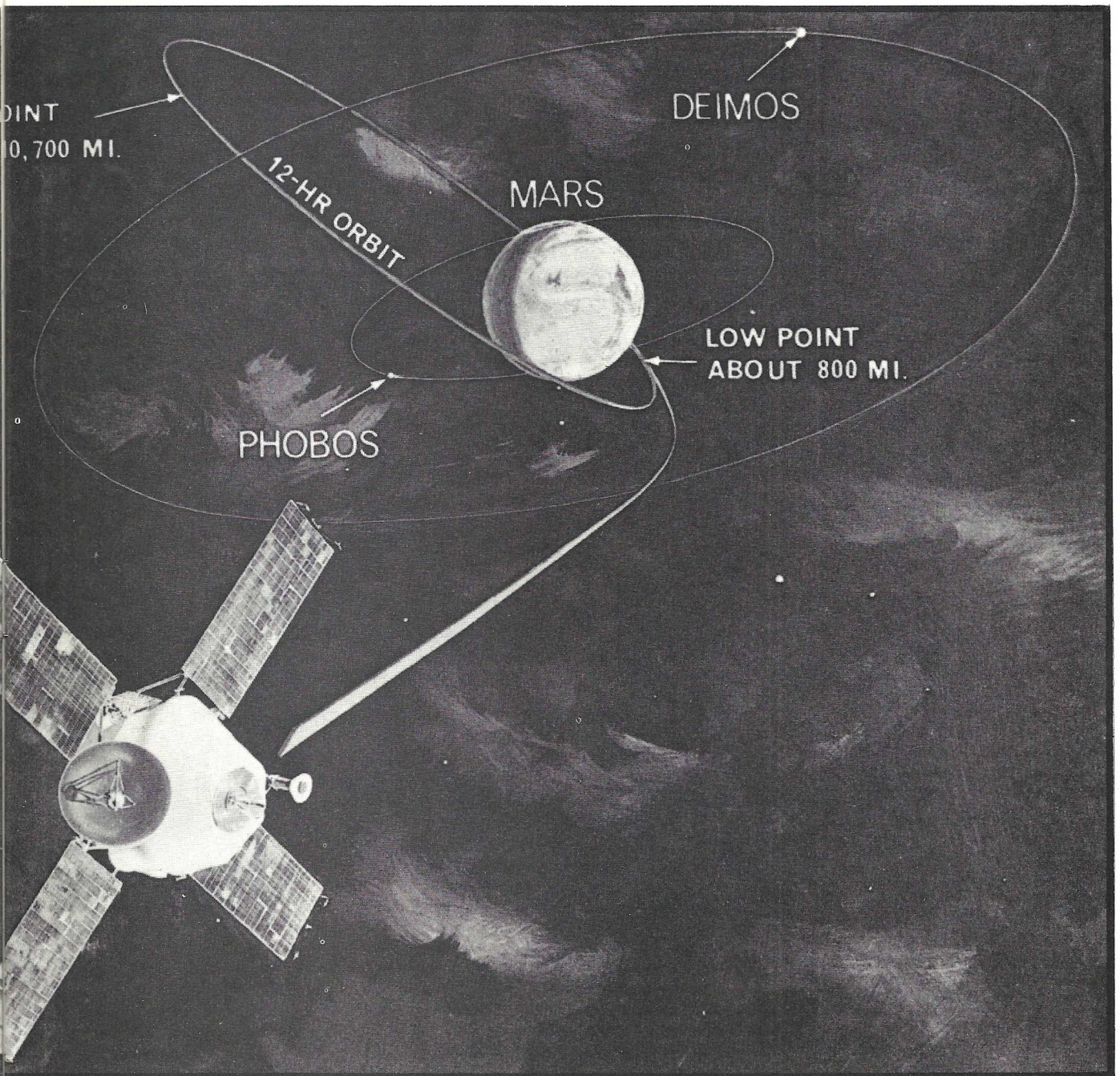
Where this technique is impossible to employ for one reason or another, engineers may apply a new kind of rocket engine to push the probe ahead faster. For the past ten years various companies

have been developing an ion propulsion engine: an electric rocket. Although the ion drive motor produces a thrust of only a few pounds, it can keep it up for very long periods of time as compared to conventional rocket engines, which burn their fuel in a few minutes.

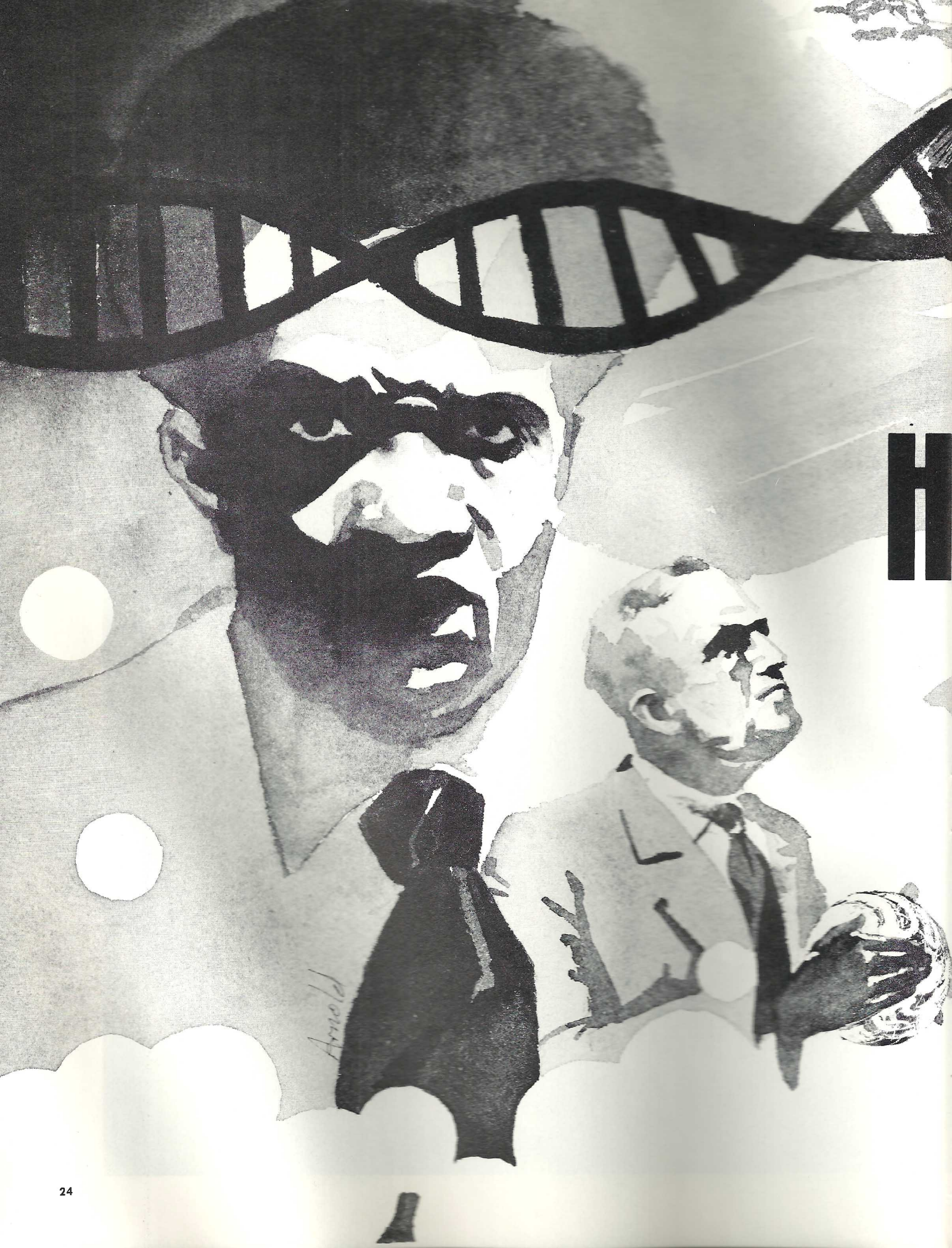
One ion unit, designed by Xerox Corporation's Electrical and Optical Systems Division, produced only three-tenths of a pound of thrust. However, with only five pounds of cesium metal as reactant, the engine could run at full power for

an entire year, gradually building up speed. The whole motor weighs only about ten pounds and runs on electric current that serves to ionize the cesium into a jet of charged atoms, which in turn provides the thrust for the probe. Later editions of the ion drive will be even lighter and more powerful.

**S**imply propelling the spaceprobe is not enough, though, because especially precise guidance is required for it to reach its destination. The great  
*turn to page 64*







H

Arnold





# EISENBERG IS DEAD

fiction / Dick Ashby  
artist / Stevan Arnold

**One criteria of scientific investigation is to be able to get repeatable experimental results. Otherwise the experiment is meaningless.**

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Because I am black and only a scant generation out of Africa, I drink. Because I am maimed and frighteningly ugly from my wounds, I drink. I drink and for a glowing tangled while I am again Loamba, tall in my youth and strongest in my village, soul brother through dark ceremony to Fisi, the hyena . . . a beast despised in this country because he is not understood, but valued by my tribe and honored by my clan.



Or when I drink I am Ben Loamba, chosen amongst the chosen and picked from my veldt by the white man who preached of his God and sent to many schools. And when I am very drunk, I turn my thoughts to triumphs . . . my graduation from Oxford . . . "A brilliant nigger," I once heard it whispered of me, and to the staff work I did at Eddington Centre for Research near Brighton. And of the silly white girls who threw themselves into my bed. Aieee, for I was handsome then, and there were letters of honors behind my name, and many golden wenches helped me ward off the bitter chill of the English winters.

When I drink.

But even drunk there is always with me the helpless rage, the sorrow that devours the soul, and the knowledge that all is lost and that I reside in this brutal jungle-without-dignity that is called Watts . . .

I had been up all night with my spidery, make-shift tools and the electron microscope before I knew that those first electrifying tingles of suspicions were true! I had actually manipulated molecules by "crude" mechanical devices! Peterson-Smith, my assistant shouldered aside his fatigue long enough to view the change I had wrought in an amino-acid chain and became quite beside himself with excitement.

"By God, Ben, you've actually done it!" He hugged me, clumsily. "You black bastard, do you realize what this means?"

I realized. "It means ten, twenty more years of hard work, Pete." But I was grinning, furiously. I had actually changed the structure of RNA proteins . . . the basic link between a gene and its enzyme. This meant, in effect, I had altered genetic memory and had changed the code of instructions that determine what a species shall look like, how it shall behave, and, indeed, its very instinctual inheritance. And I had not used radioactive atom labeling, nor streptomycin nor related chemicals, but had gone in cleanly into the sequence of amino acids and had altered them. As neatly as if plucking away wooden letters from a Scrabble sentence and revising them to make new words. And I had done it with magnetic wires, using their relatively weak force fields to do my manipulations, never touching the magical links I worked upon.

Over steaming cups of broth, later, Peterson-Smith ran and hand through his thinning black hair and regarded the scarred kitchen table thoughtfully

through his owlish glasses.

"Heisenberg is dead," he announced. "Long live Loamba!"

"Meaning?"

He took a sip from his mug. "The blind man and the soap bubble. He can't examine it without wrecking it. But I'm afraid you've faulted the good doctor's Uncertainty Principle."

I knew the principle well. It states, more or less simply, that the effort to observe turns out to destroy the would-be-observed. It is also called "Heisenberg's You-Can't-Find-Out Principle."

And in the arrogance of my youth I nodded back at Pete, and sadly relegated Dr. Heisenberg to that gallery of scientific nobles who have been proven wrong. Melancholy, black as tar, whitely grinning, exhaled, stinking from the night's labors, even to myself (Thank the Lord Peterson-Smith had his eternal drippy cold), I even then began to plan my Paper.

It was a year before I published. A year in which I produced monsters and, probably, super-creatures amongst fruit flies, chickens, and hamsters. Some of them were too awfully deformed to survive. Others, such as a carnivorous hamster with a great brain and opposed thumbs, flourished and bred true. I was scheduled for the June issue of "Bio-Physicist's Review," and in the weeks before it's appearance I was in an agony of impatience. I even wrote to my father . . . not that he could read, of course . . . but a hunter, Borkan, to whom I'd addressed it, would seek out old Dad and read him the tidings.

It read:

*Honored Father named N'ememba, greatest of my clan, beloved of our tribe, and skilled in magic doctoring. It is I, your first-born, Loamba in far away England island. My love and my blessings on you and your house. I am about to bring honor to you and to our village for I have devised a great tool of scientific learning that will change all mankind in the future and bring great betterment to all. It can even make my soul-brother, Fisi, into a kind and happy grass eater with long arms and hands. I laugh with you at that and toast your memory and our clan with beer. Your son over the distance and the waters, Loamba."*

That night I went out and got drunk and bought a tuxedo.

Thoughts of awards dinners?

Acceptance speeches?

A sword touching my shoulder at Buckingham?

I was only twenty-eight, but a *brilliant nigger*. All was possible.

The "Review" appeared with my work and for two weeks I lingered by my phone in my Brighton digs. It was holiday time outside and squads of red-faced Englishmen and their squalling kids trooped the sandy byways down to the icy sea and to sunburn, but I waited inside.

The scientific world was underwhelmed.

Nothing.

Then, in the third week of my petulance, a letter was brought me from the Eddington Centre. It was from John Cairns, director of the Cold Spring Harbor Laboratory of Quantitative Biology. After cautiously praising my results, he examined my methods and concluded that he and his team had been unable to duplicate my findings. He suggested, in the kindest possible manner, that I was mistaken in crediting magnetism as a tool, perhaps residual radiations within some of my equipment?

I crumpled the note paper.

Another day, and another letter. This from Luigi Gorini of the Harvard Medical School, winner of the great Ledlie Prize. He was astonished at my animals, but utterly puzzled at my methods, since ". . . I have not been able to duplicate them, nor have my colleagues here at Harvard."

In a rage, I drove back to Eddington Centre and duplicated my own techniques, for perhaps the thousandth time. What could be the bloody matter with these guys? It was one of the simplest processes in biology . . . simply connect one microprobe to the south magnetic pole, another to the north, and operate without quite touching. I made an adjustment on a chromosome of the bacterium *Escherichia coli*, blindly . . . with the electron beam off, of course . . . then turned power on again and saw that I had cleanly altered the codons in a peptide chain.

What the hell could be the matter with these men?

Did I have to take them by the hand and lead them through each simple step?

And after receiving similiarly disheartening letters from Hershey at the Carnegie Institution Department of Genetics, and from Charles Yanofsky of Stanford, I actually sweated up a fantastic scheme to assemble the scientific greats of Britian and baby them through my techniques. It was a project doomed from inception, of course, so in lieu of that I sought out my chief, Sir Hans Albinger, a crusty old Lord of the realm,



despite his name.

He received me in his study within the Centre, cheery with firelight and muted lamps, snug against the dismal rain outside. He took me warmly by the hand, forced a whisky on me, and plunged into the matter before I could. He cleared his throat. "Well," he said. "You. You're an embarrassment to me, my boy. I wish you had had a few words with me before publishing. Do you know why Peterson-Smith has been avoiding you? He can't make it work, either."

My stiff and angry jaw dropped open. "But he was along on every stem . . . he . . ."

Sir Hans waved his glass with authority. "And furthermore, neither can I. Oh yes, while you've been sulking these last few weeks, I've done some work. Mind you, I can't explain those bloody horrible animals and bugs you've achieved . . . at least I don't think I can, but I certainly can't effect any changes whatever in DNA, nor RNA, nor . . . for that matter a strip of mouldy john tissue. It just, simply, utterly doesn't work."

"But the animals, Sir."

A pause set in, made awkward and uncomfortable by Sir Hans' somewhat arthritic pacing to and fro before the ruddy grate. "Never mind." Then after a bit he sat at his littered desk and picked up a folder. "I know your records, naturally. Everything about you, speaking purely from an academic standpoint. But you are the first . . . ah . . . colored student we have ever had, and I find my knowledge suddenly limited. Tell me about yourself. Try, please. Tell me about your youth . . . your family. Perhaps your father . . .?"

I decided to give him some Black boy to Whitey crap until he got off this biography kick. And then I would accuse him of incompetence, for he was nearing eighty, and then I would swipe one of the lab's Minnies and drive the sixty-some miles to London and lay every tart in Picadilly and show them all what destruction a really big, really drunk nigger can accomplish!

So I gave it out to Mister Charley . . .

". . . the usual stuff for an African kid. Native kraals, tending the animals. You know, cattle and a few pigs. But mostly cattle. We blacks attach great importance to cows. We drink the blood from their necks."

A lie. My people slaughtered them for T-bones.

Sir Hans was unmoved. He toyed with a pair of dice without looking at me.

"I come from a long line of great witch

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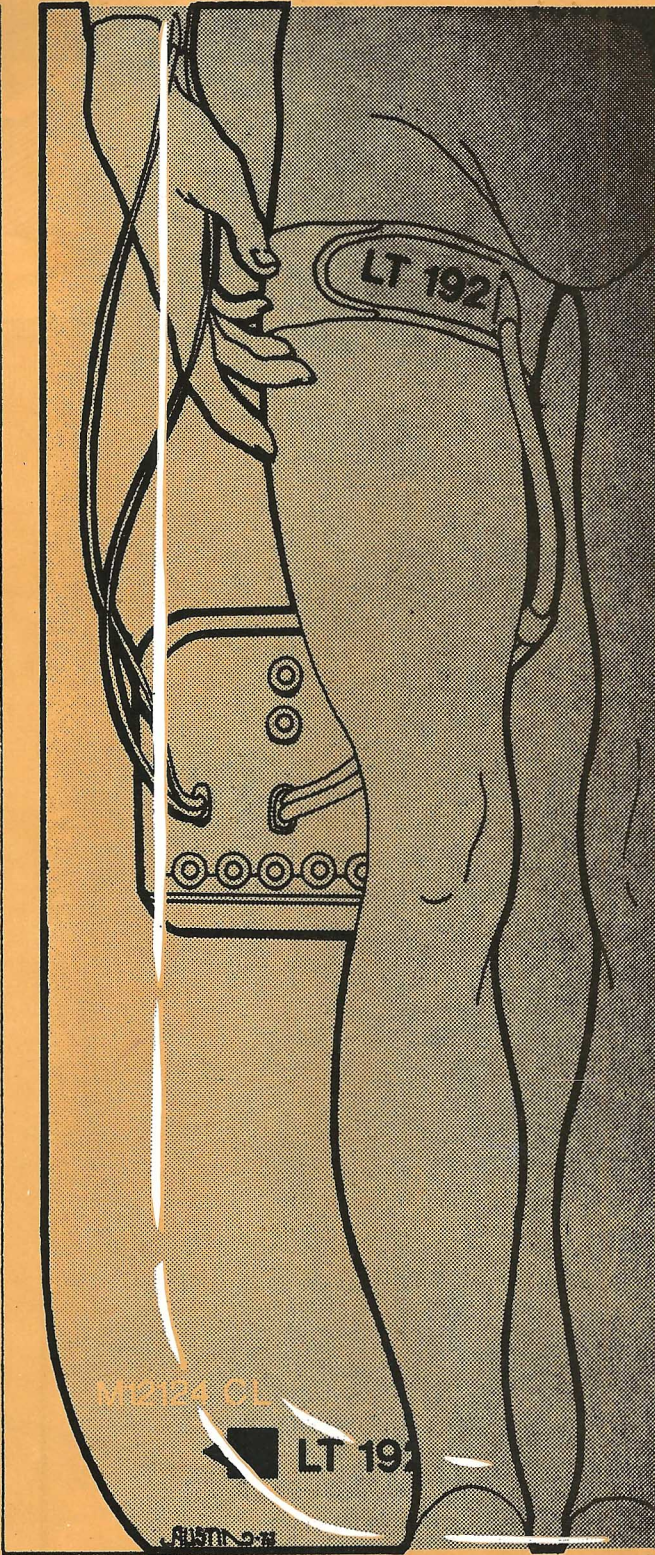


***If the experimenter cannot avoid influencing the outcome of an experiment, how can there be a verifiable form of experimentation, since all experimenters are different?***









The last man walked down the glowing corridor of capsules that extended as far as he could see and mentally kissed the stars good-bye and whispered farewell to the grass and tipped a non-existent hat to the non-existent girls on the non-existent city streets. Several hours before he had placed his love in a capsule, sealed it, reluctantly pushing the button that started the mechanism, that would permeate her body, and the intense cold would begin, that would—house that Jack built.

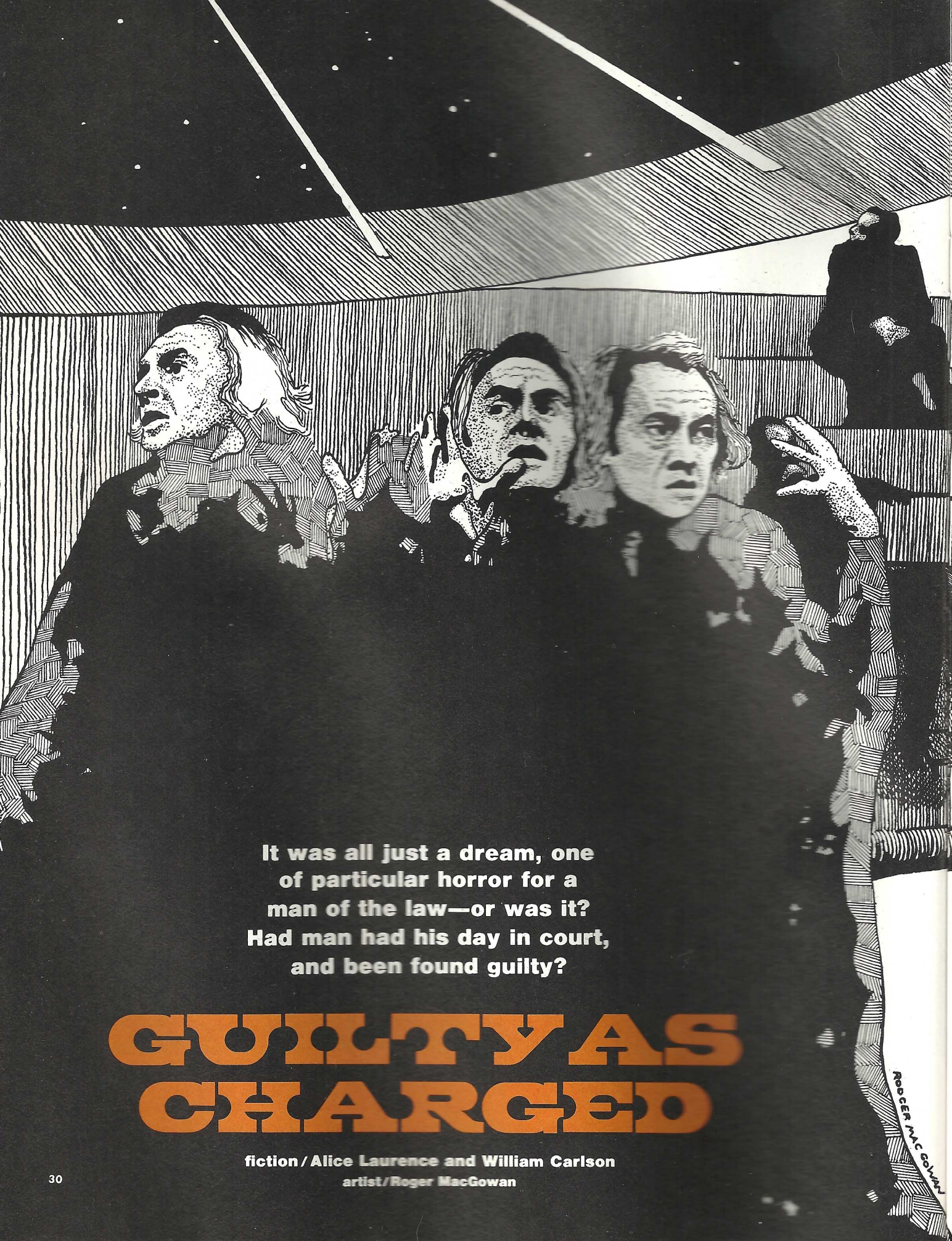
He shuddered. What a stupid thing to think of at such a moment. Doggerel! Several hundred years hence he would push the button that would gradually heat the capsule, that would replace the fluid with blood, that would—live in the house that Jack built. And happily ever after.

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# AND NO POTATOES

fiction/Walt Liebscher  
artist/Alicia Austin





It was all just a dream, one  
of particular horror for a  
man of the law—or was it?  
Had man had his day in court,  
and been found guilty?

# GUILTY AS CHARGED

fiction/Alice Laurence and William Carlson  
artist/Roger MacGowan







Nancy Kleinfeld ate her poached egg and pretended not to notice her husband, who had been staring at his orange juice for ten minutes. She didn't mind his silence—the Chief Justice presumably had weightier things on his mind than domestic chitchat. But why didn't he drink his orange juice? For twenty-seven years she had watched Louis Kleinfeld zestfully quaff his orange juice immediately after sitting down to breakfast. It was a little enough thing, but Nancy was worried.

She endured five more minutes. "Louis?" No response. "Louis!"

His white-maned head rose slowly. "Hmmm?"

Nancy did not like the look in his gray eyes. It was *absent* somehow. "Nothing. Are you—all right?"

"Certainly." The Chief Justice rubbed his forehead. "I think. Uh, last night—I was in bed all night, wasn't I?"

"Of course, whatever are you talking about?"

"Did you actually *see* me?" he persisted. "I mean did you wake up and look at my bed and see me in it?"

"Well, no. But I would have known if you were gone."

"How?"

"I just would. What is it, darling; something's wrong, isn't it?"

He remained silent, staring now at the translucent drapes covering the French windows.

Nancy Kleinfeld knew her husband. She daintily wiped her lips, then pushed her chair back from the table. "I'm sorry, dear; I didn't mean to bother you."

"Sit down, Nancy—please. It might be better if I tell someone. It's about this"—he paused—"this experience I had last night."

"Experience? Dream, you mean?"

"I guess that's what I mean. Logically, it has to be a dream. But it was so extraordinarily vivid, and you know I *never* remember my dreams—but I remember every detail of this. I can see every line of the Chief Thumbie's face—"

"The who?"

"The Chief Thumbie, the extraterrestrial who conducted the trial. They had an unpronounceable name, but I called them Thumbies because they had two thumbs on each hand."

"I—see." Nancy looked away—too late.

"I know. It's fantastic, it's amusing, but—just look at me a minute dear—please. Now, do you believe me when I say the experience I had last night is as real to me as the fact I'm sitting here talking to you?"

"Yes, I do," said Nancy Kleinfeld. She did not smile again.

"I'll start from the beginning. The trial took place in a huge courtroom, actually more of a theatre. In the stage area were three platforms. Dr. Stephan Whitman, head of the Arecibo staff, was strapped to a chair on the center platform. The Chief Thumbie was—"

"May I ask a question?"

"Certainly."

"What is Arecibo?"

"A town in Puerto Rico, site of the radio astronomy lab. Haven't you read about these new signals called Zenars they've picked up?"

"Um—no, can't say I have."

"Remember those Pulsars several years back that turned out to be dwarf stars? Well, the Zenars have a regular conformation like them, but are weaker and much more complex."

"I don't see—never mind. Go on, dear."

"Just bear with me, Nancy; everything will eventually fit together. Anyway, the Chief Thumbie and I were both robed; he sat on the platform to Whitman's right, I on the one to his left. The rest of the Arecibo staff sat at one long table between us and the audience, and a group of Thumbies sat at another one. The audience was *huge*, both human and Thumbie, and in the first few rows I noticed the President, the Cabinet, and what seemed to be most of Congress. There was no jury."

"The Chief Thumbie—by the way, they aren't radically different from us in appearance. They're thinner, a little shorter, their eyes and heads are larger in proportion, and they have longer fingers and the two thumbs I mentioned, but that's about it. The Chief Thumbie opened the proceedings by saying, 'Court is in session, Federation versus the people of Planet Earth, subdivision USA. Charges: eaves-dropping, unauthorized wiretapping, and invasion of privacy. Earthmen will be tried largely by their own laws, since they are ignorant of the Federation legal code.' He looked at me. 'I believe the pleas should be entered next, Mr. Justice?'"

"That is correct," I said.

"Stephan Whitman, you will plead on behalf of your countrymen. How do you plead?"

Dr. Whitman was a big man, round faced, red with anger. He strained against the straps holding him, but couldn't move. "Not guilty!" he shouted.

"So entered. Mr. Justice, I understand witnesses testify under oath in your country?"

"Yes indeed."

"That will not be necessary here." He pointed to Whitman. "Anyone who tells a lie while sitting in that chair will receive an electric shock. Do you understand, defendant?"

"Humph."

"State your name and position," said the Chief Thumbie.

"Stephan Whitman, administrator of the Arecibo Radio Observatory." He was still choked with rage.

"What does the Observatory do?"

"*Observe!*" roared Whitman.

"Precisely. What do you observe?"

"Electromagnetic emissions from outer space."

"And what is your latest discovery?"

"The Zenars."

"Have you been recording these so-called Zenars, subjecting them to analysis, and attempting to determine meaning in them?"

"We have," said Dr. Whitman proudly, and there was a quick murmur around the Thumbies' table.

"Thank you," said the Chief, "your confession will expedite things. The usual sentence will be executed tomorrow—"

"Now just a minute!" shouted Whitman, his face purpling, "I haven't confessed a God-damned thing!" I, too, protested this travesty of justice, and the Arecibo staff table had turned into a hornets' nest.

The Chief seemed genuinely surprised by all the fuss. When he could be heard again he said, "What is the nature of your objection, Mr. Whitman? The Zenars, as you call them, are part of the Federation Communication System; they are private communications, and you have just confessed—"

"Kindly address me as *Doctor*," said Whitman. "Now, in the first place, we did not know they were private communications."

"What did you think they were?"

"We had no idea! We had theories, of course."

"Such as?"

"Well, some compared them to Pulsars and thought they were natural radiations given off by a certain type of star. Others believed they might be broadcasts by intelligent beings, and if so, we wanted to decode them and establish communication."

"If we had wanted to talk to you, Doctor, we would have transmitted signals intelligible to you. But there is no subject of mutual interest between people of our level and people of yours."

"I resent that!" said Stephan Whitman.



"So you deliberately listened to the Zenars, recorded them, and tried to analyze them, even though you suspected they were communications."

"But we thought somebody might be trying to talk to us!"

"Did you have the slightest reason for that supposition?"

"Yes, we—OWWWW!"

"You lie," said the Thumbie.

"All right, we *hoped* somebody might be trying to talk to us."

The Chief Thumbie turned to me. "Do your laws permit the opening of private communications on the *hope* that the

"That depends on—"

"Answer the question, Mr. Justice."

"Well, basically illegal, but—"

"And isn't it also illegal by your code to record a conversation without the participants' knowledge?"

"Yes. Before a phone can be tapped, you have to show cause and get a court order."

"And isn't it true that the attempt to profit financially is a factor in invasion of privacy?"

"Yes."

"Very well. Now, Doctor Whitman, isn't it true that if you could have ascer-



envelope contains a message for you in addition to the addressee's?"

"No," I said, "but in this case—"

"Do they allow you to subject a message clearly addressed to another analysis to determine the content?"

"These messages were not clearly addressed," I said.

"Yes they were, you just couldn't read the addresses. Answer the question, Mr. Justice."

"As you phrased it, the answer would have to be *no*."

"Very well. Now, by your laws, is it legal or illegal for an unauthorized third party to listen to a private conversation?"

tained the meaning of the messages and published them, the funds allocated for your research would have been increased and you might have been eligible for prizes and monetary awards?"

"It's possible," said Whitman, "but—"

"Precisely. To sum it up, gentlemen, by monitoring the Zenars you are guilty of illegal eavesdropping; by recording them you are guilty of unauthorized wiretapping; and by subjecting them to analysis to determine their meaning in the hope of financial gain, you are guilty of invasion of privacy."

"How the devil could we invade any-

***One of the basics of our form of law is that man is innocent until proven guilty. Another is that ignorance of the law is not a defense. Unfortunately, basics sometimes become truisms, and truisms sometimes bite!***

*turn to page 95*



# VERTEX INTERVIEWS PHILIP K. DICK

interviewer/Arthur Byron Cover

*"He's totally mad," said one of his fans, "but it's such a wonderful madness." Philip K. Dick has been called everything from science fiction's bad boy to the most creative mind in the field, but there's one thing he's never been accused of: Failure to entertain his readers! And what more can a writer ask than that?*

**VERTEX:** Nearly every sf writer has some little fable about how he got hooked on the stuff. What's yours?

**DICK:** I went into a drug store looking for "Popular Science." They were out of it and I saw something called "Stirring Science Fiction." I thought, Well, shit, the title is similar. It's closer than "Nurse Romance Stories." And I took it home and read it.

**VERTEX:** What was it about the magazine that appealed to you?

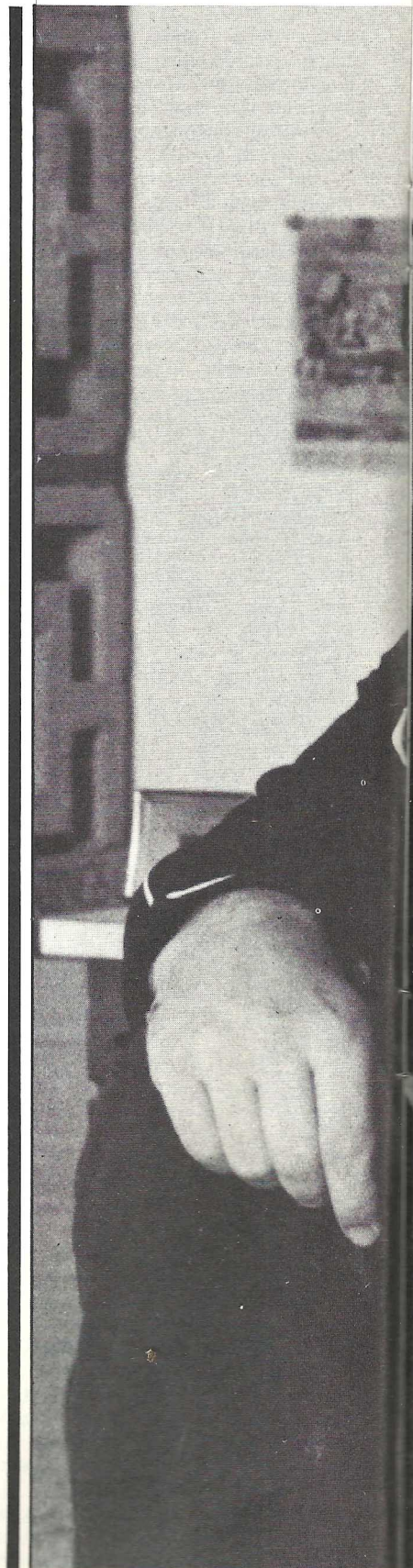
**DICK:** Well, it was such awful writing that viewed from now you can't take it seriously. You know what term they used then? Pseudo-science! It meant stories of science but not real science. Which of course was meaningless. I remember one story where they decided to find the center of the universe. It was a great flat plane which stretched out as far as the eye could see. Now I knew that wasn't true, that nobody had ever built a rocket and flown to the center of the universe, yet it had a reality to me. Apparently I had this tremendous facility to suspend disbelief that was revealed as soon as I read that ghastly story.

**VERTEX:** Did you actually believe that stories of that type were entirely possible?

**DICK:** Science fiction involves a suspension of disbelief which is different than that involved with fantasy. In fantasy, you never go back to believing that there are trolls, unicorns, witches, and so on. But in science fiction, you read it, and it's not true now, but there are things which are not true now which are going to be someday. Everybody knows that! And this creates a very strange feeling in a certain kind of person—a feeling that he is reading about reality, but he is disjointed from it only in temporal terms. It's like all science fiction occurs in alternate future universes, so it could actually happen someday.

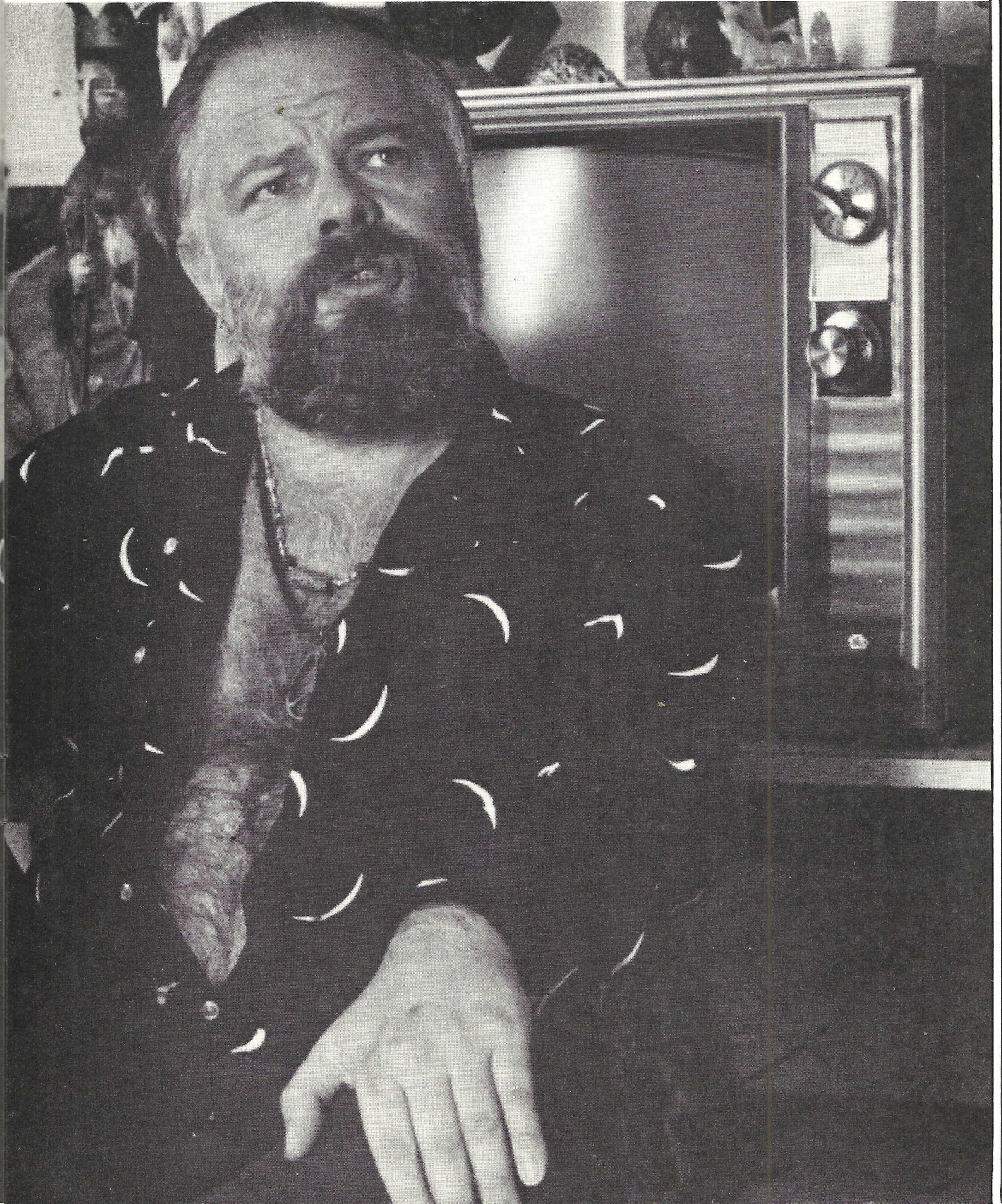
**VERTEX:** What sf writers have influenced your work the most?

**DICK:** I started reading sf when I was about twelve and I read all I could, so any author who was writing about that time, I read. But there's no doubt who got me off originally and that was A. E. van Vogt. There was in van Vogt's writing a mysterious quality, and this was especially true in *The World of Null A*. All the parts of that book did not add up; all the ingredients did not make a coherency. Now some people are put off by that.

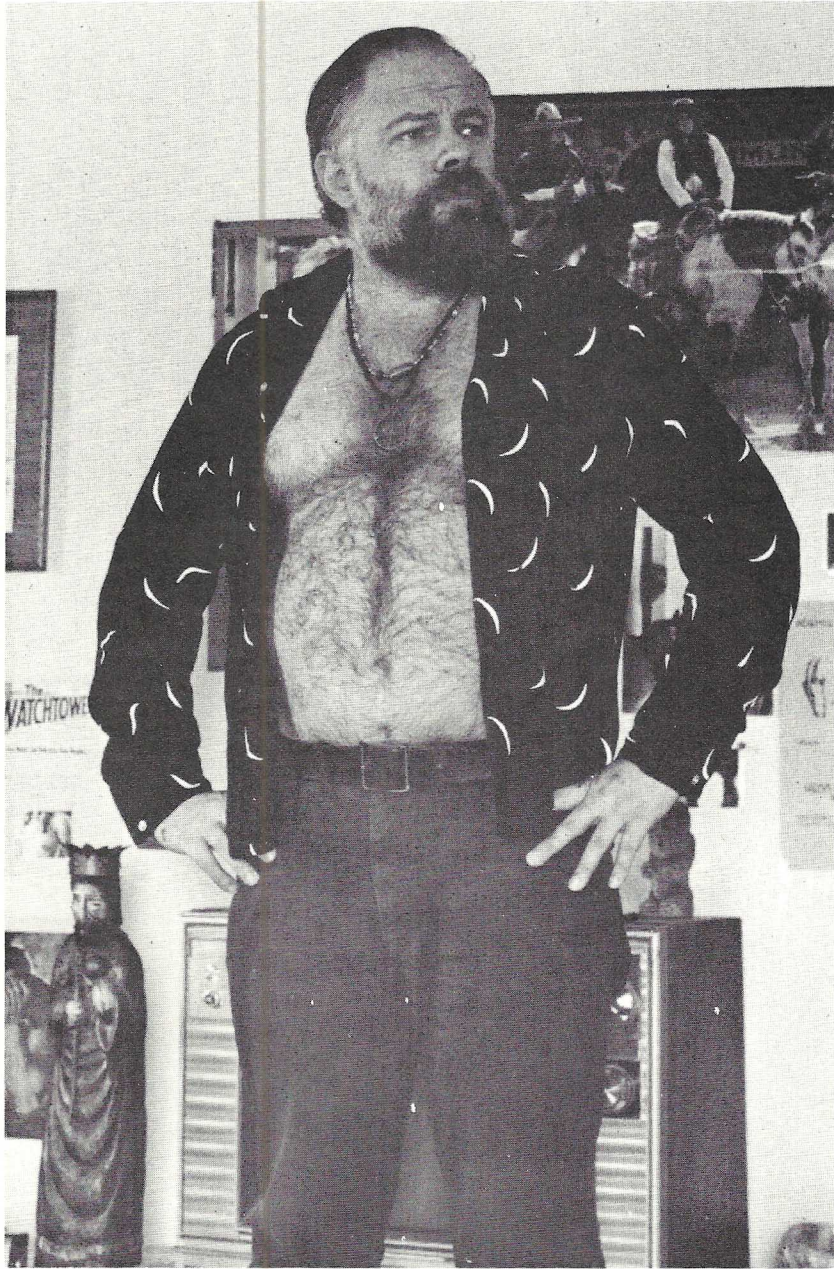




*"At one time we had only one writer  
who was even literate, and that was  
Ray Bradbury."*







*"If you use the I Ching long enough and continually enough it will begin to change and shape you as a person. It will make you into a Taoist, whether or not you have ever heard the word, whether or not you want to be."*

They think that's sloppy and wrong, but the thing that fascinated me so much was that this resembled reality more than anybody else's writing inside or outside science fiction.

**VERTEX:** What about Damon Knight's famous article criticizing van Vogt?

**DICK:** Damon feels that it's bad artistry when you build those funky universes where people fall through the floor. It's like he's viewing a story the way a building inspector would when he's building your house. But reality really is a mess, and yet it's exciting. The basic thing is, how frightened are you of chaos? And how happy are you with order? Van Vogt influenced me so much because he made me appreciate a mysterious chaotic quality in the universe which is not to be feared.

**VERTEX:** During each period of change in sf, people say that the genre is finally reaching maturity. Do you believe that sf will ever be mature?

**DICK:** What do you mean by mature?

**VERTEX:** Adult, philosophical.

**DICK:** Heavy?

**VERTEX:** Like Franz Kafka.

**DICK:** Think-piece stuff. Something that leaves a permanent residue in you. You are not quite the same.

**VERTEX:** Like that.

**DICK:** Absolutely, sure, like I can think of an example right now. Tom Disch's *Camp Concentration*. When I finished that, I was different, and I think this is what I would define as a mature work: we are *made* mature by it. I mean, you read *Of Mice and Men*, and you are never the same again. Not whether it educates in the sense that it gives you information, not that it is serious in that it is somber; it can be very funny. It's like what Aristotle said about tragedy purging you. *Camp Concentration* relieved me of the burden of believing that I had to be smart all the time.

All art of this kind is as if the author has given you permission to lay down a burden that you had somehow inherited. I won't even speak of it any further. Science fiction definitely does that. Can and does.

**VERTEX:** What do you think is the current state of sf writing? Good, bad, or indifferent?

**DICK:** I think some extraordinary good writers are appearing: Sladek, Malzberg, Disch. I hate to name specific ones, because I'll leave out one that I really like. Ursula LeGuin, for example. I think it is like the twerp fans say. "Gosh, wow!" It is



really gosh, wow! today. People are coming into the field today who are so much better than the older writers. Like Chip Delaney. At one time we had only one writer who was even literate, and that was Ray Bradbury. That's the only one, I swear by God. Something about the middle ages: "We are only men, but we stand on the shoulders of giants and therefore can see more than those giants could see."

**VERTEX:** Since you've been writing for about ten years longer than most of the people you've mentioned, does this ever make you feel jealous?

**DICK:** You know, the way I feel, if I read a science fiction book by a new writer which is a lot better than what I do, instead of going on a bumper right away and saying, "Oh Christ, I'm obsolete, I'm outdated, I've lost it." I have this tremendous sense of joy. I don't have to write all the great goddamn science fiction in the world. Somebody else is going to carry this torch. It's such a relief to sit with my feet up on the wall and to know that if I never wrote another book science fiction is going ahead.

**VERTEX:** Let's talk about the personal rewards of writing science fiction, economic and otherwise. Do you feel that the field has treated you properly?

**DICK:** I want to talk about the first thing you mentioned: economics. My first hard-cover novel, *Time Out of Joint*, sold for \$750. And my agent was so excited that he sent me a telegram to announce this joyous news. That was a long time ago, and we are still being paid about as much money as if we were standing on a street corner selling apples in the Depression. There are exceptions, like Arthur C. Clarke. But in effect the publishers are saying, "You're lucky we're printing your book at all. We could charge you for the cost of printing it." It is cruel and inhumane what they pay writers. It's a disgrace.

**VERTEX:** Economics aside, do you think you've spent your life well?

**DICK:** I love writing. I love it. I love my characters. They're my friends. When I finish a book, I go into post partem, never to hear them speak again, never to see them struggling and trying. And I've lost them, because a writer doesn't really reread his own works. But then, other people will read them.

**VERTEX:** Why do you love writing and creating characters?

**DICK:** It's not generally recognized

that the author is lonely. Writing is a solitary occupation. When you start your novel you seal yourself off from your family and friends. But in this there's a paradox, because you then create new companions. I would say I write because there are not enough people in the world who can give me enough companionship.

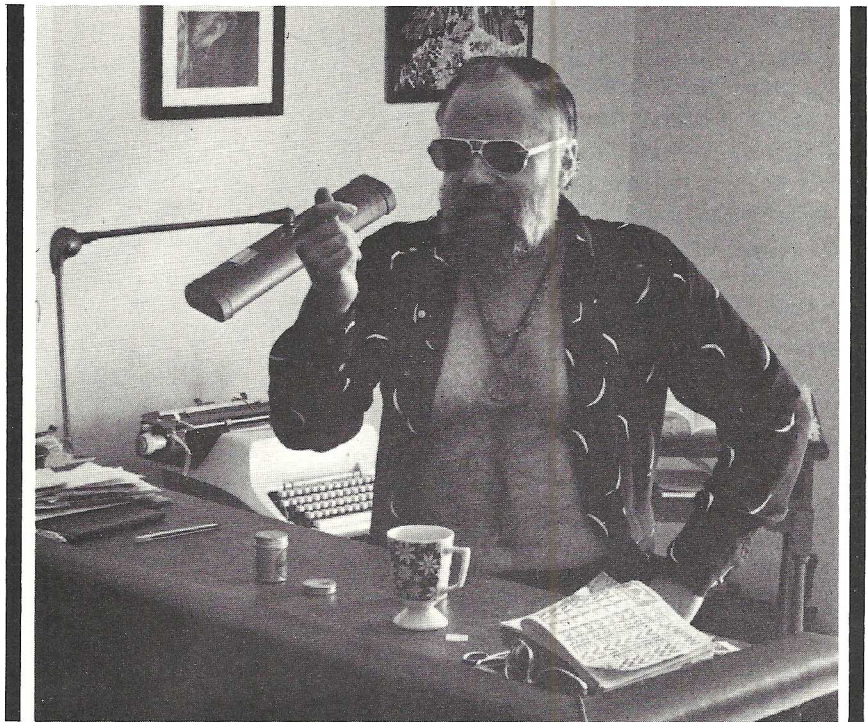
To me the great joy in writing a book is showing some small person, some ordinary person doing something in a moment of great valor, for which he would get nothing and which would be unsung in the real world. The book, then, is the song about his valor.

You know, people think that the author wants to be immortal, to be remembered through his work. No. I want Mr. Tagkomi from *The Man in*

tremendous bad acid trip, so to speak. I wrote that before I had ever seen LSD. I wrote that from just reading a description of the discovery of it and the kind of effect it had. So if that, which is my major novel of a hallucinogenic kind, came without my ever having taken LSD, then I would say even my work following LSD which had hallucinations in it could easily have been written without taking acid.

**VERTEX:** Isn't "Faith of Our Fathers," from Harlan Ellison's *Dangerous Visions*, supposed to have been inspired by or written under the influence of acid?

**DICK:** That really is not true. First of all, you can't write anything when you're on acid. I did one page once while on an acid trip, but it was in



*the High Castle* always to be remembered. My characters are composites of what I've actually seen people do, and the only way for them to be remembered is through my books.

**VERTEX:** You are known as one of the first authors to experiment with LSD. What effect has it had on your writing?

**DICK:** I don't know of any. It's always possible that it's had an effect I don't know about. Take my novel *The Three Stigmata of Palmer Eldritch*, which deals with a

Latin. Whole damn thing was in Latin and a little tiny bit in Sanskrit, and there's not much market for that. The page does not fall in with my published work. The other book which suggests it might have been written with acid is *Martian Time-slip*. That too was written before I had taken any acid.

**VERTEX:** How much acid did you take anyway?

**DICK:** Not that much. I wasn't getting up in the morning and dropping acid. I'm amazed when I read the things I  
*turn to page 96*



**T**he landing had been successful. Now there was only one thing left to do.

I stepped into the hatchway slowly, careful not to bump my back-pack against the top. I scrunched down on all fours as was necessary to get through the hatch onto the small porch outside the MEM. Other men had done this many times before, but the only one I had anything in common with was Neil Armstrong when he went through the same routine to become the first man on the moon. The difference was that I would become the first man on Mars.

I went down the ladder by degrees, savoring every step closer to the ground. Finally, after I had the boys at Mission Control biting their nails, I reached the bottom rung and majestically lowered my foot into the pink sand.

"That's another small step for a man, . . ."

Well how the hell do you expect a guy to be original at a time like that?

**B**en Johnson and I were there for three days, the longest first mission on record. We had all the luxuries, too. TV coverage, the Mars Rover, everything.

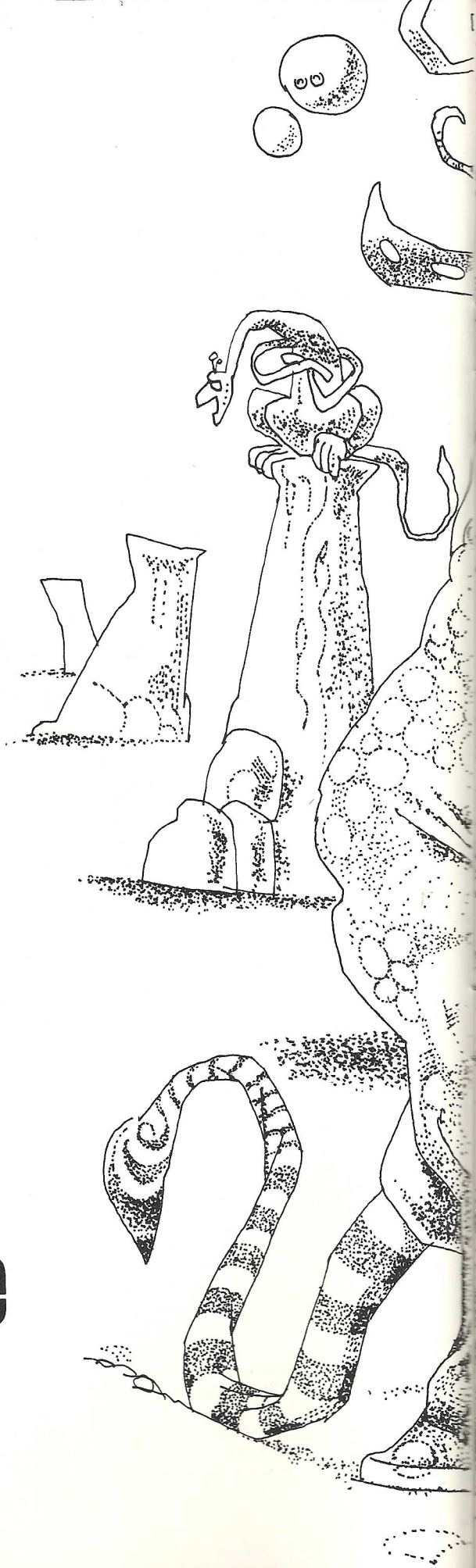
From the time we landed, Zeus 7 (I'll never understand why they didn't call

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# The Mars Stone

fiction/Paul Bond

artist/Monte Rogers







rogers





A man may spend years on a project,  
only to find that at the penultimate  
moment the everyday world intruding  
on his victory—perhaps changing  
the course of the whole universe.

---

fiction / Joseph F. Patrouch, Jr.  
artist / Alicia Austin

one LITTLE ROOM





**an everywhere**



He had been at the party barely long enough to be greeted by his host and to have a drink placed in his hand when he saw her. He blinked twice and then stared. She was sitting in a low canvas chair that forced her to show more of her thighs than she probably intended, though the brevity of her miniskirt indicated that she intended to show quite a bit. And they were gorgeous legs. He admired her taste in displaying them.

He ran his eyes slowly up her body. The blue dress she wore clung to her in a way that raised fascinating questions. Did she wear any undergarments at all? Could her tummy really be that flat and her waist that narrow without help? Could breasts that full, be that firm, without a bra?

Her neck, like her legs and arms, was slim and long. He became aware of the totality of her angular face and of her piled-up butterscotch-colored hair before he noticed any of the details. Her small, slightly pointed chin. The delicate nose. The high forehead with wisps of hair trailing across the top. The earlobes which somehow invited him to nibble at them.

And her mouth, a rose-bud of a mouth, with sharp white thorns that could inflict such delicious pain.

He licked his suddenly dry lips and tried to take a sip from his warming Manhattan. But he couldn't get his arm to move. It just quivered on his shoulder.

The rose turned to a smile, and the thorns disappeared behind the red petals of her lips. An electric spark discharged through the air as their eyes met. He knew what he wanted to do, what he was going to do. And from deep in her blue eyes he learned that she wanted it too.

He moved across the room like a panther stalking its prey, and the alert prey awaited his coming.

Zelzor listened intently to the sounds being piped down to him from the bridge. The usual background noise one always heard in a radio sweep through space at 21 cm. was intensified slightly by the starship's proximity to a small orange sun. What was of particular interest was the steady beep-beep-beep that seemed patterned and intentional.

He was startled when Aylmar overrode the signal. "The Doppler Corrector spotted it and woke me. I thought we should stop and check into it."

"I agree. Do we have any data on the system it's coming from?"

"Interstellar Survey puts the last team



*Over the millennia man has developed his intellectual abilities, but sex still has a habit of returning man to the caves, much to his pleasure, and sometimes much to the pleasure of those who are out there watching!*



through here some time ago, so the information is probably inaccurate. But here it is anyway. It's a nine-planet system with sentient life on the third planet only. The IS survey was run in 1847 their time. Let's see, local date now should be about . . . 1970, give or take a few years. In 1847 technology was at a very rudimentary level. The survey team recommended letting it ripen another two hundred and fifty to three hundred years before rechecking."

"If what we are picking up is really an attempt to communicate with another star system, then they're reaching out pretty early."

"Might mean anything. Sudden freak genius. Excessive stimulation from wars. Even interference from a non-United Stellar system."

Zelzor's scientific curiosity had definitely been aroused. He wanted to stay. "But can we afford the time? These medical supplies have to be gotten to Tau Ceti IV."

Aylmar as Captain of the starship and Zelzor as its Science Officer were a team. Since they were the only two on the ship, neither outranked the other. They had to work together smoothly, and they had to agree on lines of action.

"The spores that fell were of a known variety. We can delay as much as seven tenths and still save the whole population. Yes, Zelzor, I think we can look around at least long enough to formulate a recommendation for IS."

"Good," assented Zelzor. "First, please send me down IS's tape of their language, along with the coordinates where the tape was made. Then get us to Sol III as quickly as you can while I try to match the tapes with this signal we're getting. At least it'll be a start."

He looked at her with tense excitement, trying to read her psychology in her unblinking blue eyes. He sensed that she disliked the noise and smoke. He took her hand, nodded towards a door. Wordlessly, she flowed upwards and went with him.

Zelzor and Aylmar stared incredulously at the data displayed on their respective screens.

"Hundreds of objects in orbit," Aylmar muttered.

"And several deposited on their moon. It wouldn't surprise me if they had some on the next planets in and out."

"Venus and Mars," Aylmar supplied from the IS records.

"Yes."

"Well, something certainly heated up

their technology in a hurry. The question is, what? Personally, I'm afraid of interference. In which case we could be in serious danger."

Both Zelzor and Aylmar knew that a threat to them was a threat to the entire population of Tau Ceti IV. Those medical supplies were their first responsibility.

"I wish I didn't have to agree with you," Zelzor said. "But whoever's interfering certainly wouldn't want us getting to Tau Ceti with the information."

"On the other hand," reminded Aylmar, "we're not really sure. If only the computers could have cracked that signal. 21 cm. Repeating pattern. It must be intended for an intelligent race other than their own. They've got to be reaching out."

"Hey," said Zelzor with noticeable excitement, "that's an argument against interference! The interferers wouldn't let them reach out."

"Good." Neither of them wanted to leave yet. "But, what about their signal?"

"Well, for one thing, it's extremely weak, weaker even than the signals they send back and forth to themselves. It's hard to see how they intended it to carry to the stars, despite the repeating pattern on 21 cm. As for the message itself, it's a series of numbers. One beep, pause, five beeps, pause, and so on for eleven numbers. Then it starts over again. One oddity is that none of the numbers are in double figures. Of course, the IS team's language tape was of no help. The coordinates were too far from those of the signal."

Aylmar sighed. "You keep at the tapes and the computers. I'll monitor the stuff they send each other. Radio, T.V. Whatever I can find. One way or another we've got to crack that code in another five-tenths or let IS do it later."

Driven by occasional gusts of laughter and bars of music the hum of conversation from the house drifted across the neatly landscaped grounds. The air was warm, still, yet dry enough to be comfortable even for early July. They sat on a small wooden bench looking down the hillside and out over the highway and the river. The silent little fireflies that moved so quickly were automobiles, and the more lethargic ones farther away were coal barges and tugs.

They sat chatting together, wanting to come to know one another as human beings, as individuals, before obeying the primal male-female urge that had drawn them to one another.

"Elizabeth," he was saying, delighted

with his good fortune that evening. "You don't look like a Lizzie."

"Watch out," she returned his banter, "or I'll give you forty whacks."

He knew his next line shouldn't be "That's exactly what I'm going to give you, babe," so he pushed the remark from his mind and said, "Call me Allan."

"Call you Allan because it's your name, or call you Allan because it's as good as any and you don't want me to be able to trace you in the morning?"

He was surprised at the bitterness and loneliness mixed in that question. He didn't know how to reply to such unexpected honesty.

So he said, "The name is Allan Eastland, the address is 124 Alexandria Drive, and the phone number is 298-4371. Here." He reached in his pocket, pulled out his billfold, took out a card. "It's all on this card. Business address and phone too. See: Eastland's Radio and TV Supplies and Repair."

She didn't look at or accept the card. He put it away.

Feeling trapped he added, "In case you don't know what I'm trying to say, I'll say it plainer. I want to know you for a long time. This may sound crazy, but I think I want to know you for the rest of my life."

A look of uncertainty flickered across her face, but she brushed it away by raising her hand to the wisps of hair on her forehead and fluffing them just a bit.

Each of them waited a moment, each hoping the other would find a different, less true, less painful subject for conversation.

A light streaked across the night sky. "A falling star!" she exclaimed, relieved at having something to say.

"Yes," he said. "I saw it too." He paused a moment. "Have you ever tried to imagine what it would be like to be a falling star? A meteor, that is?"

"Why no. What a strange thought. Who would think of something like that?"

"Well, me for one. Just think how empty and lonely it must be between the stars. And you're just a hunk of rock being pulled one way by one star's gravitational field and another by the gravity of another star. Till one millenium you meet a star you can't get away from, and you rush towards it faster and faster. And suddenly there's this planet that swells up in front of you. Before you know it the friction in its atmosphere is rubbing on you while you get hotter and hotter till *Whoosh!* that's it."

She looked at him mockingly. "And



I know just what I'm supposed to be thinking, that I'm like that hunk of rock. I've been drawn from one man, or star, to another till I fell for you."

He noticed that she hadn't finished the analogy. They both laughed in anticipation.

"What other queer ideas do you have?" she asked. He wondered if she had chosen the word queer deliberately. Probably, he decided. Boy, he'd gotten a live one this time!

"All right," he said. "I do have something to let you in on. Come here."

The two huddled together like conspirators.

"What I'm trying to do," he whispered, "is contact . . . some people . . . from outer space."

"You're a flying saucer nut!" she exclaimed gleefully.

"Well, I wouldn't go that far." He was suddenly a bit embarrassed. "It's mostly wishful thinking. Our technology won't take us to the stars till long after I'm dead. But I'd sure love to get there on someone else's technology."

He had become intensely serious, and she knew it. She tried to be a proper sounding board for his ideas.

"Look at all those stars up there. How can there not be other forms of life, other races? And maybe, just maybe, one of them is aware of us. If only one flying saucer report is true, just think what it means."

He was standing now, unable to keep still.

"So, just on the off-chance that someone is out there listening, not light-years away but here in our own system—on that small chance, I've set up a transmitter at my place broadcasting a tape continually at 21 cm. That's the wavelength most radio astronomers think would be best for interstellar communication, and if it's good enough for them, it's good enough for me."

She was impressed with his consuming interest in such a kooky idea, but she was a bit jealous too. He'd forgotten her. He was in his universe, and she wasn't a part of it, not right then. Well, she decided, no bunch of wires and dials was going to upstage her.

"Could I see it? It sounds fascinating." He looked down at her. She leaned a bit forward and smiled up at him. Even by starlight he could see the valley of flesh she wanted him to see.

"It's at my place," he said.

"I know," she smiled sweetly, "I know."

**D**o I remember you're saying there

were eleven numbers, none larger than nine?" Aylmar asked through the Communications link.

"Yes," Zelzor responded, "and I still haven't been able to make any language out of it."

"If I'm right, you're not making any language out of it because it isn't any language."

"What are you getting at?"

"Listen," Aylmar explained. "I was just monitoring one of their TV shows, and I think one of the commercials gave us the clue we needed."

"Get to the point, Aylmar. We've only a tenth left."

"What was the sequence of numbers?"

Zelzor had long ago memorized them. "1-5-1-4-2-9-8-4-3-7-1."

"Why," Aylmar gloated, "it's as easy as ABC. A: dial 1 for long distance. B: dial 5-1-4, the area code. C: dial 2-9-8-4-3-7-1, the person's home phone. Zelzor, you've been trying to decode a telephone number!"

"I'm sure you're right," a chagrined Zelzor admitted. "Shall we—ah—give it a try?"

"It's all we've got," Aylmar replied. "I'll connect us through our Translator to their phone system. At worst we can say wrong number, and hang up."

**T**hat was very impressive," she admitted, almost against her will. She saw the equipment as her rival, but at least now she understood it better. And she knew that her equipment was superior any day.

They stepped out of the short hallway into another room.

"And this," he announced unnecessarily, "is my bedroom."

"Oh, yes," she replied, now much more sure of herself. "So this is where we make one little room an everywhere."

"What?" That one had escaped him.

"John Donne. 'The Good Morrow.' The poet's explaining that even though he's made love to other women before, all of them were merely foreshadowings of his lady. When he is making love with her, the room they're in is an everywhere. There's nothing and no one outside it. I was an English major in college."

"Well then, my lady," he said, bowing gracefully and waving an arm neatly through the air, "I would say the time has come to isolate ourselves from the universe with Master Donne." He closed the door, latched it, and stepped towards her.

She melted into his arms so that they

touched each other along as many surfaces as they could. Lips, tongue, arms, breasts, belly, thighs, all flowed together and began moving. He caught the zipper at her back and moved his hand down her spine till it rested on her seat. He rubbed her buttocks with that hand while he slipped the other along her bared back. She shrugged one shoulder, then the other, and her dress dangled loosely between them.

Without separating their mouths they moved apart enough to see the dress fall to the floor. A quick downward glance assured him she had on only the flimsiest of bras, through which he could see the round strawberry targets of her nipples. His hands told him of a halfslip and some pantyhose. She moved her thighs twice against him and her shoes were gone. With a practiced hand he gathered her bra together behind her shoulder blades and unsnapped it. His other hand was yanking downward on her slip. In a moment she was clinging to him in nothing but her pantyhose.

Desperately he took hold of his turtleneck and pulled it and his undershirt off together. Then he replaced his mouth on hers, sucking on her tongue and rolling the warm globes of her breasts against his chest. She reached down and undid his buckle, snap and zipper. He forced off his loafers and stepped out of his pants and underwear.

They did a sinuous snakelike dance-step to the bed and slid together down onto it. He disengaged himself from her mouth and tore off his socks. Then he turned sideways on the bed and hooked a thumb in her pantyhose, worked them down, uncovered that gently heaving living tummy while traveling his tongue down her neck, down her breast, down of the way out of her pantyhose. He slipped them down around her ankles, slid his face farther down her tummy, moistened her belly button. Went on down.

Breathing heavily, her breasts bobbing this way and that, she sought him with her hands, with her mouth. "Where are you?" she asked. "Oh, where are you? I'm ready. I'm ready. Come here." And she moved her thighs apart.

He pivoted gracefully about her pubic area. Her hands caught him. He thought of that lovely mouth, those sharp white teeth, that active tongue. They moved spasmodically closer together. And then

the phone rang.

**O**dd," Zelzor muttered. "I could have sworn someone answered



that phone."

"I thought so too," Aylmar agreed.

"Hello? Hello! HELLO!" Zelzor shouted, trying to establish communications.

"Let's step up the power. There, maybe now we'll get something."

"... worry about," drifted through the Translator, its timbre retained so that they knew it was male. "If they call again, it's off the hook. Come on, babe, I thought you said something about being ready?"

"I did. I am. Come on in." A female voice.

"Here it is. How's that, babe?"

"Oh god yes. Up a little. Good good. Keep that up up up."

The sound of breathing became deeper and more rhythmic.

"How's that? and that? and that?" the male voice kept repeating, and "Great oh great oh great" came the moaned replies.

Suddenly Aylmar broke the connection. "Zelzor! Zelzor! Do you know what that was? Why, that was sex! They're so primitive that they still haven't

learned the proper method for dealing with their sexual impulses!"

Zelzor heard the shock in Aylmar's voice, and he was even surprised to find himself breathing more heavily than usual, his heart beat more forcefully.

"I don't understand it," Aylmar was saying. "How can they have sex and an advanced technology too? It is universally true that an interest in the one cancels out any interest in the other. Why, mixing sex and technology is as impossible as mixing religion and sex!"

"You're right about one thing. The whole idea really shakes you up. But the inhabitants of Sol III have evidently worked out a way to link the sex drive and technology."

"Let's slow down a little, Zelzor. Let's go nice and slow. Link the sex drive and technology? Have they or haven't they? What other evidence might we have? One short phone call just isn't enough."

"True," admitted Zelzor. "What else did you get off their TV?"

"Well, let's see. There was something about their advertising. What was it exactly? Oh yes. They don't sell hair creme

or soap or deodorants, they sell love potions. And owning one of their automobiles is supposed to guarantee sexual success and gratification."

"More support for my theory. And Aylmar, think what this means for all the races in the galaxy. For all of us it was sex versus technology. Sex stood between us and progress, so that when we finally discovered the immortality process we naturally worked out a method to control our sexual impulses. Sex was too dangerous, there was no more need for children . . . you know the arguments. Aylmar, you helped formulate them. And after we became immortal and learned to control sex, we poured our creative energies into technology, where we thought they belonged."

"Zelzor," Aylmar began tentatively.

"But this race can show us how to have sex and technology. Why, it'll revolutionize the social structure of every race in the galaxy."

"What an ugly theory, Zelzor. If you're right, this planet may have to be destroyed. Such ideas are more dangerous than the plague spores that fell on Tau Ceti IV."

"It probably works in one of two ways, perhaps both together," Zelzor theorized aloud, scarcely aware that Aylmar was listening. "The technological stunt either gets 'em so jealous they put out just to prove to themselves they can make it in a male's world, or it impresses them so much they lay down as if beneath a god, sacrificing themselves for their god's pleasure."

"Zelzor, what you're thinking . . . why, it's degenerate. I'm actually ashamed to be on the same ship with you."

"Oh Aylmar, Aylmar, don't you remember those first few hundred years, just after we were made immortal? Our life together then was so different from this, so much more exciting and . . . and personal. Why, I haven't even seen you since we began our life on this starship. That's been twenty-five thousand years and more."

"Zelzor, control yourself!"

"And right now I think it's been a mistake to let you, you delicious female, live sealed off at the other end of this starship, even if separate imprisonment is the proper method to cure sexual desires. Oh, if I only had you here now, do you know what I'd do with you, babe?"

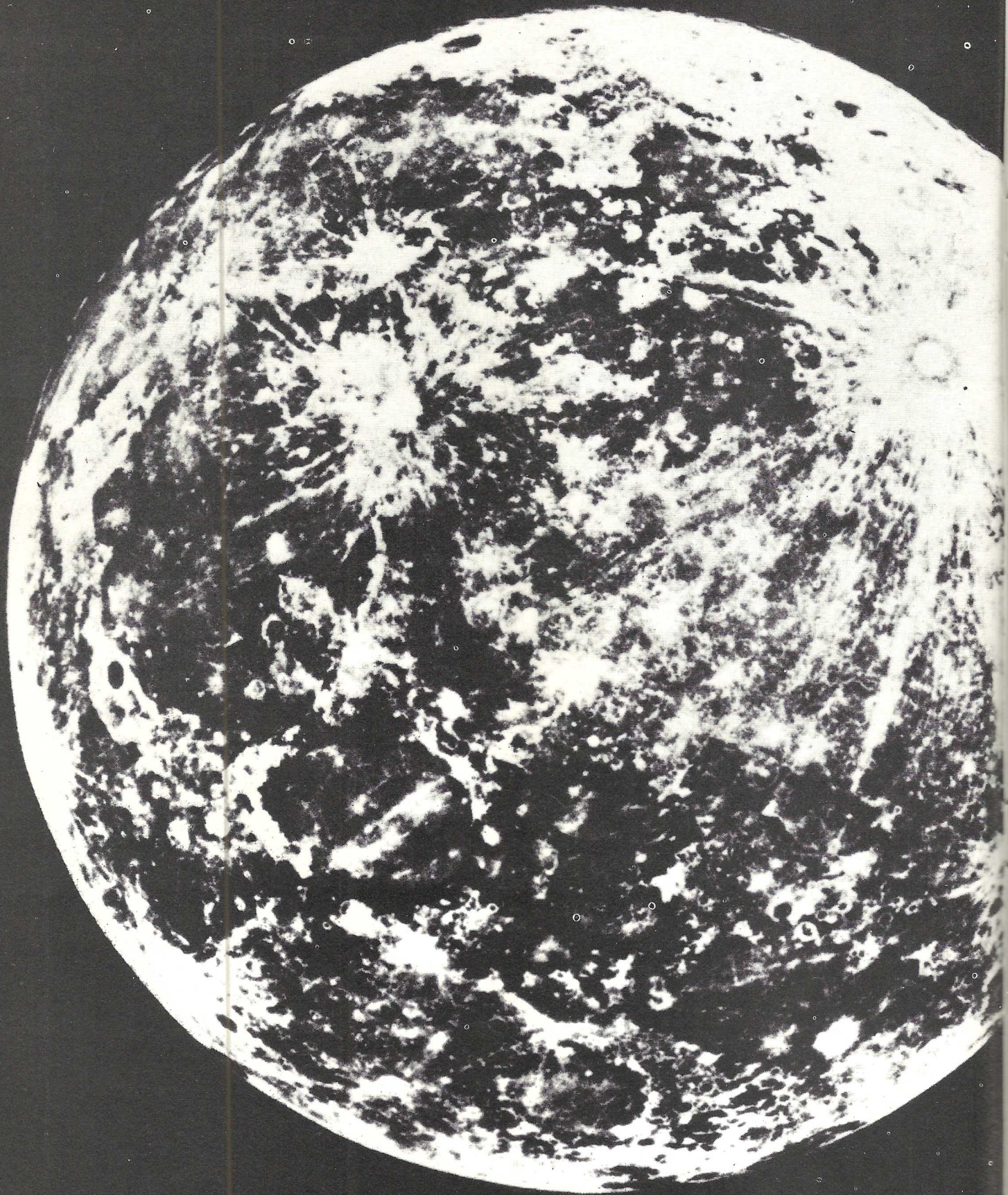
"Zelzor!" and she broke the connection.

"Damn," he growled, frustrated.

And the starship leaped towards Tau Ceti IV with its critical cargo. ○











**We've been to the moon now,  
but the questions the lunar geographers  
wanted answered have just led to  
even more questions.**

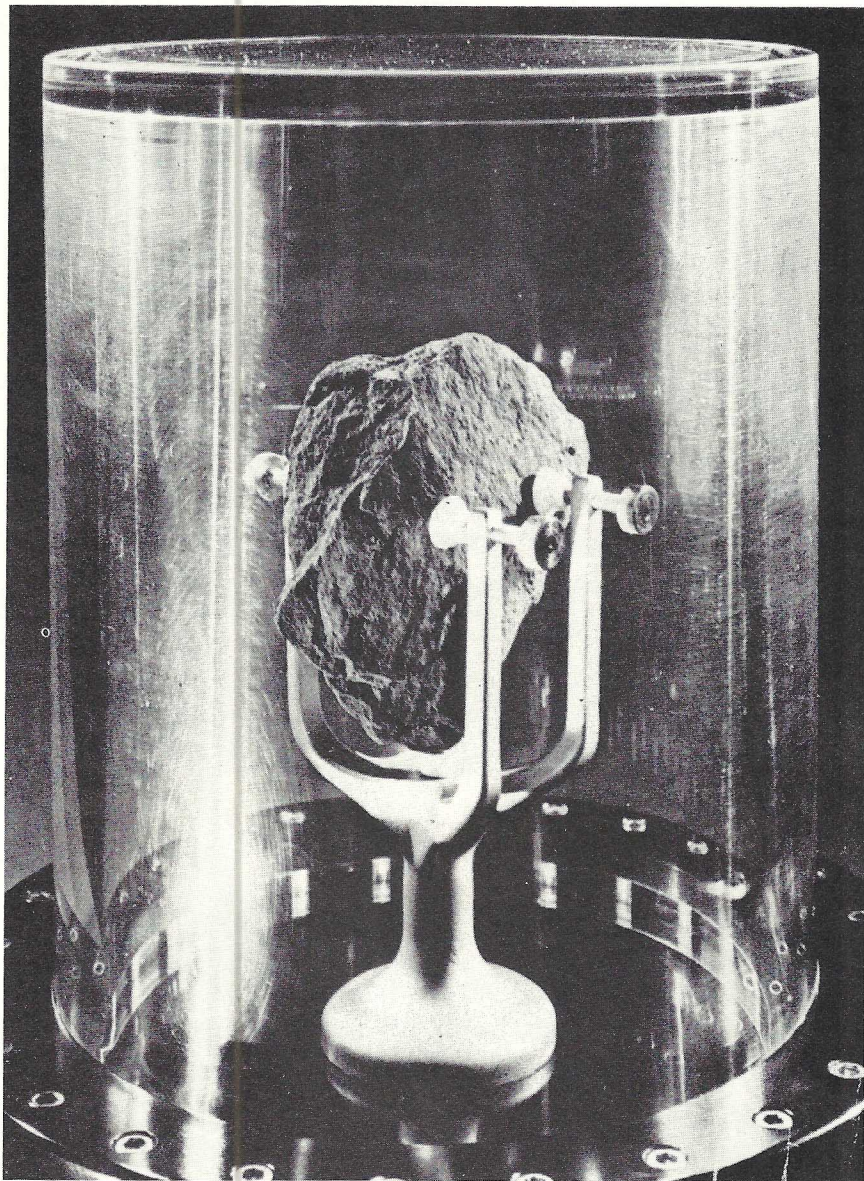
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**article/JAY ARROW**

# **SELENOGRAPHY**

**I**t took thousands of years of staring at the moon, with the naked eye and with ever-more-sophisticated telescopes, and finally it took six manned expeditions costing billions of dollars, but at last the science of Selenography, the study of the geography of the moon, is a science with a subject and some definite answers to the questions man has been asking for all those thousands of years. ■ While the lunar missions, from Apollo 11 to Apollo 17, were concerned with the physical properties of the surface in their particular location, scientists have, ever since the study of the moon began, been involved with the overall construction of the moon, and it is to that which we must first turn our attention, if only to make the findings of the astronauts meaningful.





In general, the moon is divided into two broad classifications, highlands and lowlands, or lunarite and lunabase. While the scientists tend to use lunarite and lunabase, everyone from mission control to the astronauts to the Sunday Supplement writers have used highlands and lowlands, so, on the theory that popularization makes for popularity, let's stick with those terms.

The distribution of highlands and lowlands on the moon's surface follows a discernible pattern. A belt of dark lowlands, some 50 degrees wide on the average, obliquely rings the lunar globe, with a few interruptions between 85 degrees North latitude on

the facing side and a still undetermined point on the far side. This belt is generally irregular and developed much more strongly on the side turned towards Earth. Outside of this belt lowlands occur only sporadically. On the far side of the moon highlands predominate to the almost complete exclusion of lowlands in the northern and central portions, which are balanced against the high country in the southern part of the visible face.

Large lowland areas, usually 200 miles and over in diameter, and some minor areas of irregular configuration, are referred to as *maria*, with the exception of one, the largest of all, *Oceanus Procellarum*. Smaller seg-

ments of lowlands connected to the maria have been named *lacus* (lake), *palus* (marsh) and *sinus* (bay).

There are several different types of maria. There are the compact and usually hexagonal maria with high ground all around, scarps or mountain ranges, which may have been partly destroyed. Mare Imbrium and Mare Crisium are good examples of this type of maria, which is *never* round. Oceanus Procellarum and Mare Frigoris are another type, with irregular quadrangular outlines and no surrounding mountains. Still a third type is common among the minor maria areas, loose connections of lowland-filled craters and ring mountains which have coalesced into "seas" of lowland material.

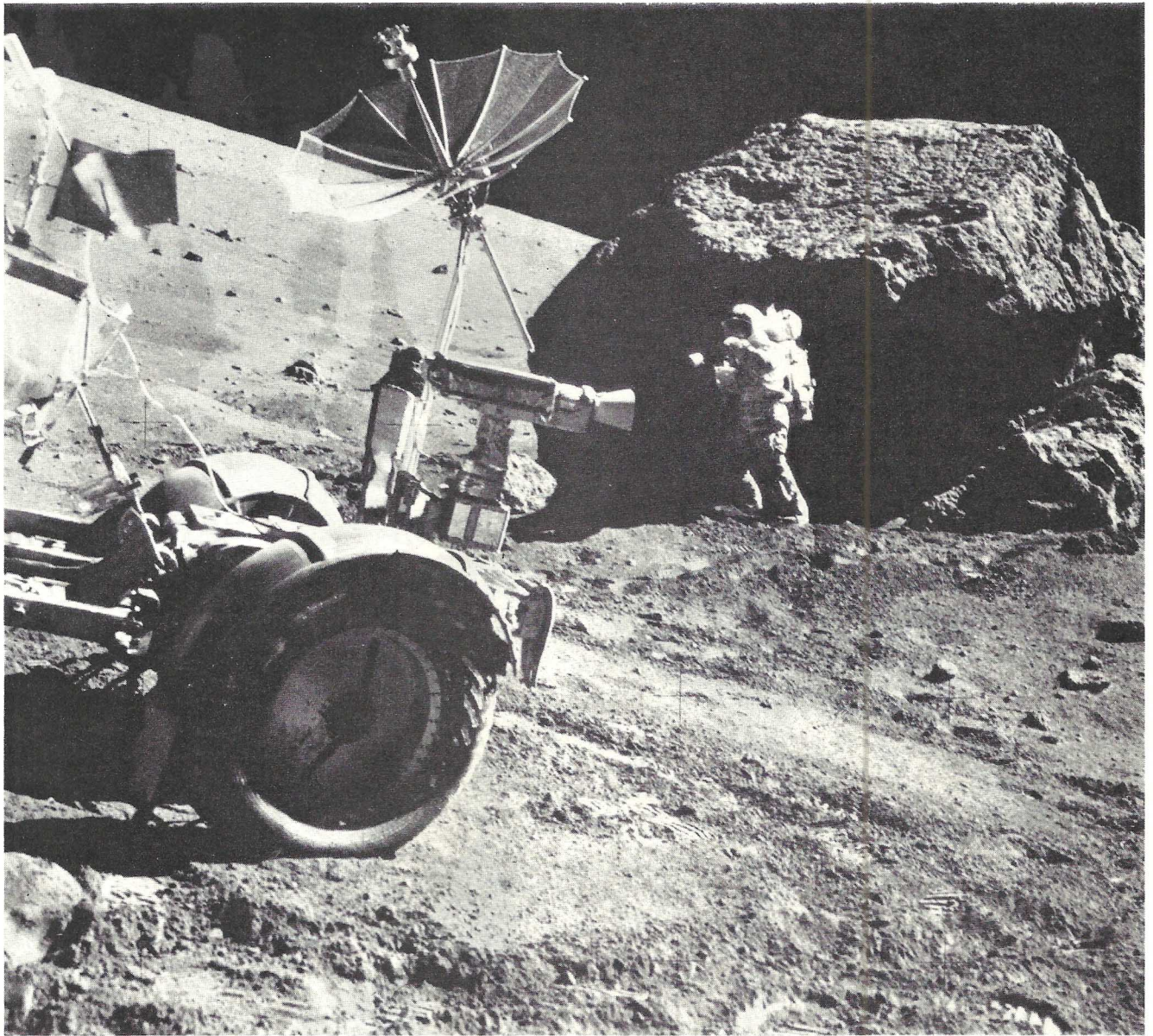
The final *major* feature of the lunar lowlands are the wrinkle ridges. These low overlapping ridges are found only on the lowland plains, and are like no other features found on the moon. Their outlines are blurred and heights do not go over 3,000 feet. Some of these ridges are associated the highland coastlines of maria, and others with surface fractures or craters, and sometimes the level of the maria is different on each side of the wrinkle ridge, indicating that it may be a surface flex-point in the crust. The Serpentine Ridge in Mare Serenitatis is the largest and only named example of wrinkle ridges.

In contrast to the level lowlands, the highlands are generally made up of various forms of mountain systems, some connected to or surrounded by maria. While there is no collective term for highland features rising from lowland maria, segments of highland material extending from the main body of the highlands into maria are called *promotoria*, meaning cape. Some promotoria, such as Promotoria Kelvin, are really islands of highland material in a maria, and not proper capes.

There are several different types of mountains found on the moon. Block mountains are the remnants of a shattered plateau and are lacking in individual summits. Block mountains usually consist of sharply angled blocks of highlands isolated from each other by faults. Often the blocks will be tilted, making for sharp ridge-lines, such as is found in the Taurus Mountains.

Scarp mountains are the uptilted of edges of much larger blocks than





**Scientist Astronaut Harrison Schmitt made Apollo 17 one of the most productive, from a selenographical standpoint, of the manned lunar missions.**

those which make block mountains The Jura, Altai and Soviet Mountains which reach heights of 20,000 feet are in this class. Chain mountains, the most common type of mountain structure on Earth are comparatively rare on the moon. Those which do exist can be divided into two types. The first, such as the Lunar Apennines, looks like the Andes and is made of a sharply uptilted scarp, split by valleys and bordering on a lowlands plain. The second type of chain mountain is best represented by Leibnitz and Doerfel Ranges near the south pole. Actually these chains consist of crossing ring mountains, cut by steep, deep valleys, with their highest points where two rings

cross.

The most prominent of the highland features are the craters. While actual craters will be discussed later in the article, the major formations, those most visible can be more accurately called ring mountains.

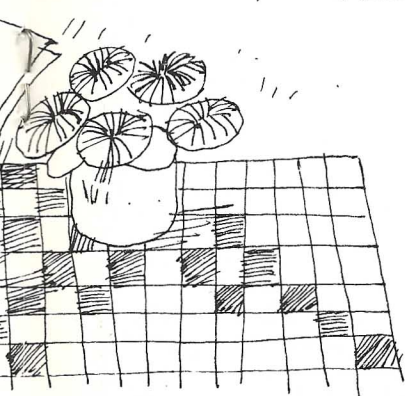
A lower area in the highlands, surrounded by still higher ground, is one of the most common features of the lunar landscape. In almost all cases the ground enclosing a lunar depression is higher than the country farther out, and towards this slopes gently while dropping at a steeper grade in towards the center of the crater. This is the structure of some  
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All he wanted was something t





**D**arien Jones looked down at the unpalatable mess the prison cook was heaping on his plate and suppressed an urge to pick up the tray and shove it back in the cook's face. After three years and two months in jail he knew every bland unchanging dish by heart. Tonight, wet scalloped potatoes made with thin powdered milk, burnt on the top and cold on the bottom. Beside the potatoes, another menu staple: overcooked canned peas and carrots. He knew they would taste like cardboard and have the consistency of mush. Next to the vegetable was a slab of white bread. The main course was "meatloaf" made from sausage, crackers and oatmeal. Dessert was a puddle of instant caramel pudding.

Darien glanced away and for a moment he remembered a small sidewalk cafe in Paris where he had eaten French bread, melons and cheeses, and had drunk Liebfraumilch wine. The contrast was almost painful. It was a sick society that would condemn anyone to an Arkansas jail, he thought as he sat down. But it was an act of perversion to do it to a gourmet.

Just one more time! he thought, picking up his fork. Somehow he managed to get most of it down.

Four hours later, Darien was in a dark corridor watching the guards change shifts. In his hand was a heavy rock. For three years he had waited for this chance.

# A MATTER OF TASTE

fiction/Mary McClellan Johnson  
artist/Monte Rogers

to eat, and instead he ended up in the middle of a nightmare he couldn't wake up from



As the dayshift man, already in street clothes, moved toward him, he flattened himself against the wall and counted the approaching footsteps.

Now! he thought, moving quickly.

Perfect! Old Sam had gone down without so much as a groan. Darien dragged him into a small closet and took his clothes. He tied him up, gagged him, took his gun, his watch and his wallet. The watch was a good one. But there were only two dollars and twenty cents in the wallet. And one credit card.

## THE INTERNATIONAL BREAKFAST BARN

The Card Of Distinction  
The Home Of Good Taste

SAMUEL H. LUND  
Lifetime Card

Damn! he said as he shoved the wallet in his pocket. Why couldn't he have had a Diners Club card or something useful? Darien glanced at his new watch. March 29, 1978: 10:36. No time to worry about it now. If "Sam" didn't show up at the gate in three minutes someone would begin looking for him. Darien pulled Sam's hat down over his ears and sprinted down the corridor.

Ten minutes later he was running through the woods, laughing aloud. Freedom! After three long years. He had planned it so they would not miss either him or Sam for at least nine hours.

Hitch a ride, he thought. Get hold of some money. A big steak dinner. And then get laid. God, yes, get laid. After three long years. But first, the steak. There were substitutes for women, but none for a really good dinner.

Even as he ran, his mouth began to water. Filet mignon, charcoaled on the outside, rare and juicy on the inside. Fresh mushrooms sauteed in butter. A Caesar salad with garlic croutons, anchovies and fresh ground pepper. Baked potato with sour cream, bacon bits and chives. Asparagus in hollandaise sauce. And for dessert, fresh strawberries, grapes and cheeses.

Twenty minutes later he had hitched a ride and was heading north out of Arkansas. By nine o'clock the next morning he was across the state line and into Missouri. During the night he had stolen a car, and still there was nothing on the radio about his escape. Once he had stopped for coffee. But now he was getting sleepy. And hungry. Ahead, he saw a familiar red barn structure which reminded him that he did have one credit card.

Darien groaned. The International Breakfast Barn was not his idea of a good place to eat. But after three years and two months, anything would taste better than institutional fare.

"One for breakfast, Sir?" the waitress said. She was wearing a pale orange uniform, with a pale blue apron around her waist. Darien thought she looked delicious. Her apron was tied in a big starched bow and he watched the way her hips moved as he followed her across the room.

Breakfast steak! he decided, picking up the menu. On the plastic cover was an idealized drawing of the Breakfast Barn with a crowd of euphoric people walking toward its door. Inside, against a background of blue and white and orange, there were photographs of the offered fare. There was a patty melt with french fries, garnished with lettuce, parsley and two tomato slices. Next to it was a hamburger club sandwich with french fries, garnished with lettuce, parsley and two tomato slices. Beyond that was fried fish with french fries, garnished with lettuce, parsley and two tomato slices. Darien turned to the breakfast section.

Although he could not find breakfast steak, he did discover twenty kinds of pancakes and eight different waffles. There were chocolate chip pancakes served with fluffy whipped butter. There were chocolate chip waffles served with fluffy whipped butter. There were banana nut pancakes, apple pancakes, swedish pancakes, cream cheese blintzes. All served with fluffy whipped butter. After a night of no sleep, the thought of all that syrup and butter made him ill.

"Where's your breakfast steak?" he said as the waitress poured him a cup of coffee out of a plastic coffee urn.

"Sorry, Sir, but it's not a meat day."

"Not a meat day?!" Darien stared at her.

"No, Sir, it's Thursday. The cheese blintzes are very good, though."

"Just bring me some scrambled eggs."

"Toast or pancakes, Sir?"

"Toast!"

"And bacon substitute, Sir?"

Darien nodded. When had Congress made Thursday a meatless day? he wondered. Christ! Pretty soon you wouldn't be able to get meat at all.

Underneath his coffee cup was a blue and orange and white paper place mat covered with jokes and simple-minded puzzles. As he ate his breakfast he looked around the room and realized how familiar it all was even after three

years' absence. Every International Breakfast Barn was exactly like every other one. The pale blue settees. The faded formica table tops that always smelled slightly of ammonia. The faded blue and orange and white curtains that always looked like they needed another wash. The endless varnished wood and stainless steel. The plaque of international coins on the wall.

By nine-thirty he was finished and headed out the door. But he had not taken three steps when suddenly he came to an abrupt halt. His mouth dropped open and he stood there in a state of shock. The country scene was gone. He was now in the middle of a busy city. A green newspaper box beside him read: "Seattle Post-Intelligencer."

"Seattle!" he said. "Jesus H. God!" Where the hell was Seattle? He was sure that it wasn't in Missouri.

Darien leaned against the paper box for support. And received his second shock. He read the date on a newspaper.

June 12, 1986.

But he did not have time to think about it. A white car marked "Seattle Police" was pulling into the parking lot. Almost as a reflex, Darien turned and walked back into the Breakfast Barn.

"One for lunch, Sir?" the waitress said. She was wearing a pale orange uniform with a pale blue apron around her waist. Darien thought she looked delicious. But he was too upset to think about it. He glanced over his shoulder to see if the cop were following and then looked around for cover.

"I'm with that woman over there," he said and hurried toward an elderly woman who was seated alone.

"I know we haven't met, Madam," he said sliding in across from her.

"No, we certainly haven't!"

"Yes, but, well you see . . . my Mother just died, and . . . you look so much like her. I thought maybe I could just sit here with you for a few minutes, and—"

"Oh dear, I'm sorry. Yes, please do sit down. Did it happen just recently?"

"About three weeks ago, Madam."

"How dreadful. How very dreadful. I know how you must be suffering. My Herbert died only six years ago. A more considerate, more generous man you couldn't ask for. He was as honest as the day is . . ."

The coffee! Darien thought. Someone dropped something in my coffee. He looked around the room. It was exactly the same. The pale blue settees. The faded blue and white and orange cur-

turn to page 92



article / Joanna Russ  
artist / Monte Rogers



# The Image Of Women In Science Fiction

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*Just as woman has demanded equality in life,  
the fictional woman in science fiction is  
ready to become a full character, rather than  
a backgrounded sex or search object.*





*Despite it being an uphill fight, women have advanced a long way toward equality in fact—but not, unfortunately, in the pages of fiction, science or otherwise. And if science fiction is supposed to reflect a future reality, it's time that the characters became a bit more real.*

in the very near future (such as *On the Beach*) but most science fiction is not like this; most science fiction is set far in the future, some of it *very* far in the future, hundreds of thousands of years sometimes. One would think that by then human society, family life, personal relations, child-bearing, in fact anything one can name, would have altered beyond recognition. This is not the case. The more intelligent, literate fiction carries today's values and standards into its future Galactic Empires. What may politely be called the less sophisticated fiction returns to the past—not even a real past, in most cases, but an idealized and exaggerated past.

### Intergalactic Suburbia

In general, the authors who write reasonably sophisticated and literature science fiction (Clarke, Asimov, for choice) see the relations between the sexes as those of present-day, white, middle-class suburbia. Mummy and Daddy may live inside a huge amoeba and Daddy's job may be to test psychedelic drugs or cultivate yeast-vats, but the world inside their heads is the world of Westport and Rahway *and that world is never questioned*. Not that the authors are obvious about it; Fred Pohl's satire, *The Age of the Pussyfoot*, is a good case in point. In this witty and imaginative future world, death is reversible, production is completely automated, the world population is enormous, robots do most of the repetitive work, the pharmacopoeia of psychoactive drugs is very, very large, and society has become so complicated that people must carry personal computers to make their everyday decisions for them. I haven't even mentioned the change in people's clothing, in their jobs, their slang, their hobbies, and so on. But if you look more closely at this weird world you find that it practices a laissez-faire capitalism, one even freer than our own; that men make more money than women; that men have the better jobs (the book's heroine is the equivalent of a consumer-research guinea pig); and that children are raised at home by their mothers.

In short, the American middle class with a little window dressing.

In science fiction, speculation about social institutions and individual psychology has always lagged far behind speculation about technology, possibly because technology is easier to understand than people. But this is not the whole story. I have been talking about intelligent, literate science fiction. Con-

Science fiction is *What If* literature. All sorts of definitions have been proposed by people in the field, but they all contain both The What If and The Serious Explanation; that is, science fiction shows things not as they characteristically or habitually are but as they might be, and for this "might be" the author must offer a rational, serious, consistent explanation, one that does not (in Samuel Delany's phrase) offend against what is known to be known. Science fiction writers can't be experts in all disciplines, but they ought at least to be up to the level of the *New York Times* Sunday science page. If the author offers marvels and does not explain them, or if he explains them playfully and not seriously, or if the explanation offends against what the author knows to be true, you are dealing with fantasy and not science fiction. True, the fields tend to blur into each other and the borderland is a pleasant and gleeful place, but generally you can tell where you are. Examples:

J. R. R. Tolkien writes fantasy. He offends against all sorts of archaeological, geological, paleontological, and linguistic evidence which he probably knows as well as anyone else does.

Edgar Rice Burroughs wrote science fiction. He explained his marvels seriously and he explained them as well as he could. At the time he wrote, his stories did in fact conflict with what was known to be known, but he didn't know that. He wrote *bad* science fiction.

Ray Bradbury writes both science fiction and fantasy, often in the same story. He doesn't seem to care.

Science fiction comprises a grand va-

riety of common properties: the fourth dimension, hyperspace (whatever that is), the colonization of other worlds, nuclear catastrophe, time travel (now out of fashion), interstellar exploration, mutated supermen, alien races, and so on. The sciences treated range from the "hard" or exact sciences (astronomy, physics) through the life sciences (biology, biochemistry, neurology) through the "soft" or inexact sciences (ethology, ecology, psychology) to disciplines that are still in the descriptive or philosophical stage and may never become exact (history, for example). I would go beyond these last to include what some writers call "para-sciences"—extra-sensory perception, psionics, or even magic—as long as the "discipline" in question is treated as it would have to be if it were real, that is rigorously, logically, and in detail.

Fantasy, says Samuel Delany, treats what cannot happen, science fiction what has not happened. One would think science fiction the perfect literary mode in which to explore (and explode) our assumptions about "innate" values and "natural" social arrangements, in short our ideas about Human Nature, Which Never Changes. Some of this has been done. But speculation about the innate personality differences between men and women, about family structure, about sex, in short about gender roles, does not exist at all.

### And Why Not?

What is the image of women in science fiction?

We can begin by dismissing fiction set



cerning this sort of work one might simply speak of a failure of imagination outside the exact sciences, but there are other kinds of science fiction, and when you look at them, something turns up that makes you wonder if failure of imagination is what is at fault.

I ought to make it clear here that American science fiction and British science fiction have evolved very differently and that what I am going to talk about is—in origin—an American phenomenon. In Britain science fiction not only was always respectable, it still is; there is a continuity in the field that the American tradition does not have. British fiction is not, on the whole, better written than American science fiction, but it continues to attract first-rate writers from outside the field (Kipling, Shaw, C. S. Lewis, Orwell, Golding) and it continues to be reviewed seriously and well. American science fiction developed out of the pulps and stayed outside the tradition of serious literature for at least three decades; it is still not really respectable. American science fiction originated the adventure-story-cum-fairy-tale which most people think of (erroneously) as science fiction. It has been called a great many things, most of them uncomplimentary, but the usual name is Space Opera. There are good writers working in this field who do not deserve the public notoriety bred by this kind of science fiction. But their values usually belong to the same imaginative world and they participate in many of the same assumptions. I will not, therefore, name names, but will pick on something inoffensive—think of Flash Gordon and read on.

### Down Among The He-Men

If most literate science fiction takes for its gender-role models the ones which actually exist (or are assumed as ideals) in middle-class America, space opera returns to the past for its models, and not even the real past, but an idealized and simplified one. These stories are not realistic. They are primitive, sometimes bizarre, and often magnificently bald in their fantasy. Some common themes:

*A feudal economic social structure*—usually paired with advanced technology and inadequate to the complexities of a Seventh Century European mud hut.

*Women are important as prizes or motives*—i.e. we must rescue the heroine or win the hand of the beautiful Princess. Many fairy-tale motifs turn up here.

*Active or ambitious women are evil*—this literature is chockfull of cruel dowa-

ger empresses, sadistic matriarchs, evil ladies maddened by jealousy, domineering villainesses and so on.

*Women are supernaturally beautiful*—all of them.

*Women are weak and/or kept off-stage*—this genre is full of scientists' beautiful daughters who know just enough to be brought along by Daddy as his research assistant, but not enough to be of any help to anyone.

*Women's powers are passive and involuntary*—an odd idea that turns up again and again, not only in space opera. If female characters are given abilities, these are often innate abilities which cannot be developed or controlled, e.g. clairvoyance, telepathy, hysterical strength, unconscious psi power, eidetic memory, perfect pitch, lightning calculations, or (more badly) magic. The power is somehow in the woman, but she does not really possess it. Often realistic science fiction employs the same device.

*The real focus of interest is not on women at all*—but on the cosmic rivalries between strong, rugged, virile, he-men. It is no accident that space opera and horse opera bear similar names. Most of the readers of science fiction are male and most of them are young; people seem to quit reading the stuff in their middle twenties. The hard-core readers who form fan clubs and go to conventions are even younger and even more likely to be male. Such readers as I have met (the addicts?) are overwhelmingly likely to be nervous, shy, pleasant boys, sensitive, intelligent, and very awkward with people. They also talk too much. It does not take a clairvoyant to see why such people would be attracted to space opera, with its absence of real women and its tremendous over-rating of the "real he-man." In the March 1969 issue of *Amazing* one James Koval wrote to the editor as follows:

*Your October issue was superb; better than that, it was uniquely original. . . . Why do I think it so worthy of such compliments? Because of the short-stories Conqueror and Mu Panther,—mainly. They were, in every visual and emotional sense, stories about real men whose rugged actions and keen thinking bring back a genuine feeling of masculinity, a thing sorely missed by the long-haired and soft-eyed generation of my time, of which I am a part . . . aiming entertainment at the virile and imaginative male of today is the best kind of business. . . . I sincerely hope you keep your man-versus-animal type format going, espe-*

*cially with stories like Mu Panther. That was exceptionally unique.*

The editor's response was "GROAN!"

But even if readers are adolescents, the writers are not. I know quite a few grown-up men who should know better, but who nonetheless fall into what I would like to call the he-man ethic. And they do it over and over again. In November, 1968, a speaker at the Philadelphia Fiction Convention described the heroes such writers create.

*The only real He-Man is Master of the Universe. . . . The real He-Man is invulnerable. He has no weaknesses. Sexually he is super-potent. He does exactly what he pleases, everywhere and at all times. He is absolutely self-sufficient. He depends on nobody, for this would be a weakness. Toward women he is possessive, protective, and patronizing; to men he gives orders. He is never frightened by anything or for any reason; he is never indecisive and he always wins.*

In short, masculinity equals power and femininity equals powerlessness. This is a cultural stereotype that can be found in much popular literature, but science fiction writers have no business employing stereotypes, let alone swallowing them goggle-eyed.

### Equal Is As Equal Does

In the last decade or so, science fiction has begun to attempt the serious presentation of men and women as equals, usually by showing them at work together. Even a popular television show like *Star Trek* shows a spaceship with a mixed crew; fifteen years ago this was unthinkable. *Forbidden Planet*, a witty and charming film made in the 1950's takes it for granted that the crew of a spaceship will all be red-blooded, crew-cut, woman-hungry men, rather like the cast of *South Pacific* before the nurses arrive. And within the memory of living adolescents, John W. Campbell, Jr. proposed that "nice girls" be sent on spaceships as prostitutes because married women would only clutter everything up with washing and babies.

At any rate, many recent stories do show a two-sexed world in which women, as well as men, work competently and well. But this is a reflection of present reality, not genuine speculation. And what is most striking about these stories is what they leave out: the characters' personal and erotic relations are not described; child-rearing ar-



rangements (to my knowledge) are never described; and the women who appear in these stories are either young and childless or middle-aged, with their children safely grown up. That is, the real problems of society without gender-role differentiation are not faced. It is my impression that most of these stories are colorless and schematic; the authors want to be progressive, God bless them, but they don't know how. Exceptions:

Mack Reynolds, who also presents a version of future socialism called "the Ultra-Welfare State" (is there a connection?). He has written novels about two-sexed societies of which one is a kind of mild gynocracy. He does not describe child-rearing arrangements, though.

Samuel Delany, who often depicts group marriages and communal child-bearing, "triplet" marriages (not polygamy or polyandry, for each person is understood to have sexual relations with the other two) *and so weiter*; all with no differentiation of gender-roles, all with an affectionate, East Village, Berkeley-Bohemian air to them, and all with the advanced technology that would make such things work. His people have the rare virtue of flitting the institutions under which they live. Robert Heinlein, who also goes in for odd arrangements (e.g. the "line marriage" in *The Moon Is a Harsh Mistress* in which everybody is married to everybody, but there are seniority rights in sex) peoples his different societies with individualistic, possessive, competitive, pre-World War-II Americans—just the people who could not live under the cooperative or communal arrangements he describes. Heinlein, for all his virtues, seems to me to exemplify science fiction's failure of imagination in the human sphere. He is superb at work but out of his element elsewhere. *Stranger in a Strange Land* seems to me a particular failure. I have heard Heinlein's women called "Boy Scouts with breasts"—but the subject takes more discussion than I can give it here. Alexei Panshin's critical study *Heinlein in Dimension* undertakes a thorough investigation of Heinlein vs. Sex. Heinlein loses.

### Matriarchy

The strangest and most fascinating oddities in science fiction occur not in the stories that try to abolish differences in gender-roles but in those which attempt to reverse the roles themselves. Unfortunately, only a handful of writers have treated this theme seriously.

Space opera abounds, but in space opera the reversal is always cut to the same pattern.

Into a world of cold, cruel, domineering women who are openly contemptuous of their cringing, servile men ("gutless" is a favorite word here) arrive(s) men (a man) from our present world. With a minimum of trouble, these normal men succeed in overthrowing the matriarchy, which although strong and warlike, is also completely inefficient. At this point the now dominant men experience a joyful return of victorious manhood and the women (after initial reluctance) declare that they too are much happier. Everything is (to quote S. J. Perelman) leeches and cream. Two interesting themes occur:

(1) the women are far more vicious, sadistic, *and openly contemptuous* of the men than comparable dominant men are of comparable subordinate women in the usual space opera.

(2) the women are dominant because they are taller and stronger than the men (!).

Sometimes the story is played out among the members of an alien species modeled on insects or microscopic sea-creatures, so that tiny males are eaten or engulfed by huge females. I remember one in which a tiny male was eaten by a female who was not only forty feet tall but maddened to boot. There are times when science fiction leaves the domain of literature altogether. Least said, soonest mended.

I remember three British accounts of future matriarchies that could be called serious studies. In one the matriarchy is incidental, the society is presented as good because it embodies the traditionally feminine virtues; serenity, tolerance, love, and pacifism. In John Wyndham's "Consider Her Ways" there are no men at all; the society is a static, hierarchical one which (like the first) is good because of its traditionally feminine virtues, which are taken as innate in the female character. There is something about matriarchy that makes science fiction writers think of two things: biological engineering and social insects; whether women are considered naturally chitinous or the softness of the female body is equated with the softness of the "soft" sciences I don't know, but the point is often made that "women are conservative by nature" and from there it seems an easy jump to bees or ants. Science fiction stories often make the point that a matriarchy will be static and hierarchical, like Byzantium or Egypt. (It should be remembered here that the

absolute value of progress is one of the commonest shibboleths of science fiction.) The third story I remember—technically it's a "post-Bomb" story—was written by an author whose version of matriarchy sounds like Robert Graves's. The story makes the explicit point that while what is needed is static endurance, the Mother rules; when exploration and initiative again become necessary, the Father will return. The Great Mother is a real, supernatural character in this tale and the people in it are very real people. The matriarchy—again, the women rule by supernatural knowledge—is vividly realized and there is genuine exploration of what personal relations would be like in such a society. There is a kind of uncompromising horror (the hero is hunted by "the hounds of the Mother"—women whose minds have been taken over by the Magna Mater) which expresses a man's fear of such a world much more effectively than all the maddened, forty-foot-tall male-gulpers ever invented.

So far I've been discussing fiction written by men and largely for men. What about fiction written by women?

### Women's Fiction: Potpourri

Most science fiction writers are men, but some are women, and there are more women writing the stuff than there used to be. The women writer's work falls into four rough categories.

(1) *Ladies' magazine fiction*—in which the sweet, gentle, intuitive little heroine solves an interstellar crisis by mending her slip or doing something equally domestic after her big, heroic husband has failed. Zenna Henderson sometimes writes like this.

(2) *Galactic suburbia*—very often written by women. Sometimes the characters are all male, especially if the story is set at work. Most women writing in the field (like so many of the men) write this kind of fiction.

(3) *Space opera*—strange but true. Leigh Brackett is one example. Very rarely the protagonist turns out to be a sword-wielding, muscular, aggressive woman—but the he-man ethos of the world does not change, nor do the stereotyped personalities assigned to the secondary characters, particularly the female ones.

(4) *Avant-garde fiction*—part of the recent rapprochement between the most experimental of the science fiction community and the most avant-garde of what is called "the mainstream." This takes us out of the field of science fiction



altogether.

In general, stories by women tend to contain more active and lively female characters than do stories by men, and more often than men writers, women writers try to invent worlds in which men and women will be equals. But the usual faults show up just as often. The conventional idea that women are second-class people is a hard idea to shake; and while it is easy enough to show women doing men's work, or active in society, it is in the family scenes and the love scenes that one must look for the author's real freedom from our most destructive prejudices.

### An Odd Equality

I would like to close with a few words about *The Left Hand of Darkness*, a fine book that won the Hugo and the Science Fiction Writers of America Nebula Award for 1969 as the best novel

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*Speculation about the innate personality differences between men and women, about family structure, about sex, in short, about gender roles, does not exist in science fiction at all.*

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of that year. The book was written by a woman and it is about sex—I don't mean copulation; I mean what sexual identity means to people and what human identity means to them, and what kind of love can cross the barriers of culture and custom. It is a beautifully written book. Ursula K. LeGuin, the author, has imagined a world of human hermaphrodites—an experimental colony abandoned by its creators long ago and rediscovered by other human beings. The adults of this glacial world of Winter go through an oestrus cycle modeled on the human menstrual cycle: every four weeks the individual experiences a few days of sexual potency and obsessive interest in sex during which "he" becomes either male or female. The rest of the time "he" has no sex at all, or rather, only the potential of either. The cycle is involuntary, though it can be affected by drugs; and there is no choice of sex—except that the presence of someone already into the cycle and therefore of one sex will stimulate others in oestrus to become of the opposite sex.

You would imagine that such a people's culture and institutions would be very different from ours and so they are; everything is finely realized, from their household implements to their customs to their creation myths. Again, however, (and I'm very sorry to see it), family structure is not fully explained. Worse than that, child-rearing is left completely in the dark, although the human author herself is married and the mother of three children. Moreover, there is a human observer on Winter and he is male; and there is a native hero and *he* is male—at least "he" is *masculine in gender, if not in sex*. The native hero has a former spouse who is long-suffering, mild, and gentle, while he himself is fiery, tough, self-sufficient, and proud. There is the Byronesque memory of a past incestuous affair; his lover and sibling is dead. There is an attempted seduction by a kind of Mata Hari *who is female* (so that the hero, of course, be-

comes male). It is, I must admit, a deficiency in the English language that these people must be called "he" throughout, but put that together with the native hero's personal encounters in the book, the absolute lack of interest in child-raising, the concentration on work, and what you have is a world of men. Thus the great love scene in the book is between two men: the human observer (who is a real man) and the native hero (who is a female man). The scene is nominally homosexual, but I think what lies at the bottom of it (and what has moved men and women readers alike) is that it is a love scene between a man and a woman, with the label "male: high status" pasted on the woman's forehead. Perhaps, with the straitjackets of our gender-roles, with women automatically regarded as second-class, intelligent and active women *feel* as if they were female men or hermaphrodites. Or perhaps the only way a woman (even in a love scene) can be made a man's equal—and the love scene therefore deeply moving—is to make her *nominally* male in gender.

Here is the human narrator describing the alien hero:

*to ignore the abstraction, to hold fast to the thing. There was in this attitude something feminine, a refusal of the abstract ideal, a submissiveness to the given. . . .*

Very conventional, although the story is set far, far in the future and the narrator is supposed to be a trained observer, a kind of anthropologist. Here is the narrator again, describing human women: [he has been asked if they are "like a different species"]:

*No. Yes. No, of course not, not really. But the difference is very important, I suppose the most important thing, the heaviest single factor in one's life, is whether one's born male or female. . . . Even where women participate equally with men in the society, they still after all do all the child-bearing and so most of the child-rearing. . . .*

[Asked "Are they mentally inferior?"]

*I don't know. They don't often seem to turn up mathematicians, or composers of music, or inventors, or abstract thinkers. But it isn't that they're stupid. . . .*

Let me remind you that this is centuries in the future. And again:

*the boy. . . had a girl's quick delicacy in his looks and movements, but no girl could keep so grim a silence as he did. . . .*

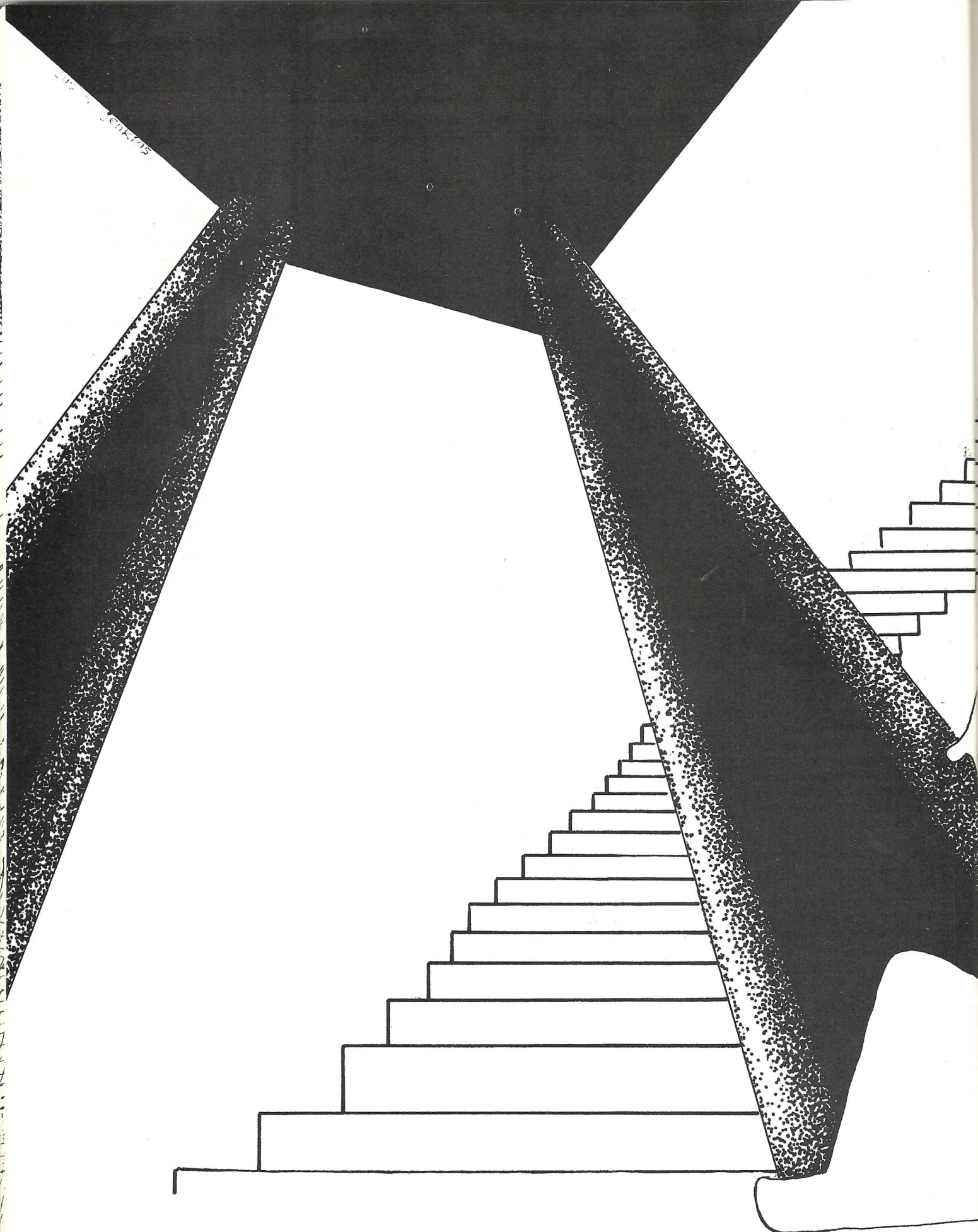
It's the whole difficulty of science fiction, of genuine speculation: how to get away from traditional assumptions which are nothing more than traditional straitjackets. Miss LeGuin seems to be aiming at some kind of equality between the sexes, but she certainly goes the long way around to get it; a whole new biology has to be invented, a whole society, a whole imagined world, so that finally she may bring together two persons of different sexes who will nonetheless be equals.

The title I chose for this essay was "The Image of Women in Science Fiction." I hesitated between that and "Women in Science Fiction" but if I had chosen the latter, there would have been very little to say.

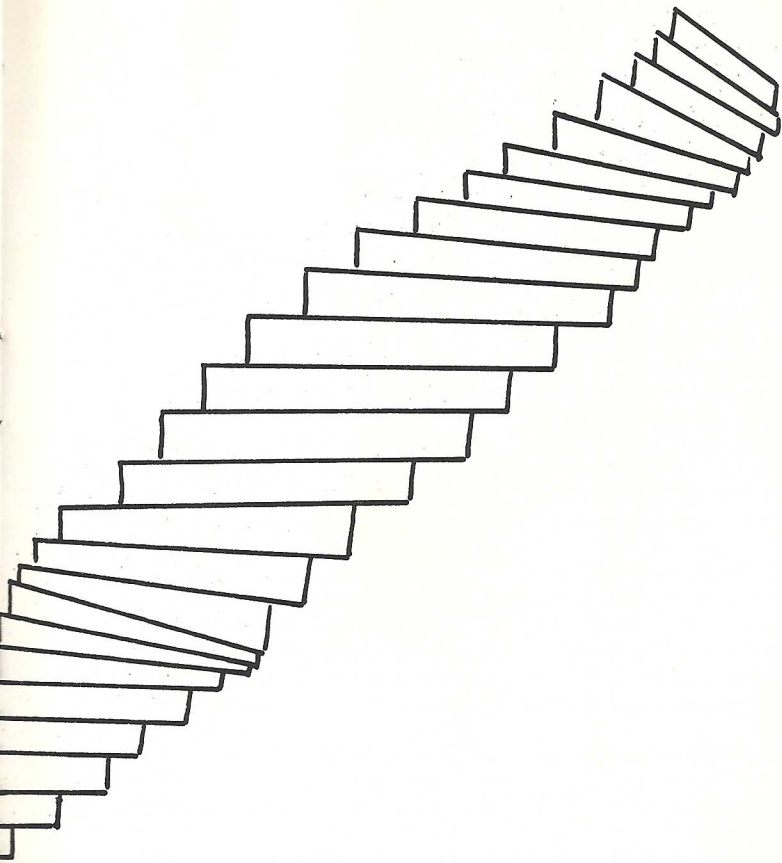
There are plenty of images of women in science fiction.

There are hardly any women. ○









Scientific study of  
non-scientific subjects  
sometimes produce new  
subjects, and sometimes  
new forms of social  
disaster and dismay.

# THE SCHLEMIHL HYPOTHESIS

fiction/Leonard Tushnet  
artist/Susan Jenkins



Peter Harris, graduate student in chemistry, was a shlemihl. He spilled the soup in the university cafeteria over the dress of the girl in front of him, he reached for a test-tube and his elbow knocked over the elaborate distilling apparatus it had taken three days to set up, he turned the petcock on the nitrous oxide tank so hard it broke off, filling the laboratory with gas.

That last accident exasperated Dr. Morgan, his advisor. "Why do you keep having these stupid accidents?" he raged.

Peter shrugged. "Accidents are accidents. They just happen."

"You call yourself a scientist?" Dr. Morgan exploded. "Nothing happens by accident. Everything has a cause." He tightened his lips. "Maybe if you think that things just happen, you'd be better off in another field." He turned away.

Peter was aggrieved when he repeated Dr. Morgan's comment to his roommate, George Clark, that evening. "He was unfair. The petcock must have been flawed. It could have happened to anyone."

"But it didn't," George pointed out. "It happened to you. Others used the tank before you."

"Sure," Peter replied. "So what? The repeated stresses finally broke the petcock."

George's thesis was on the philosophy of science. He was very conscious of hidden assumptions. "Wrong," he said. "The repeated stresses *plus you* broke the petcock. Watch yourself from now on."

For three weeks Peter's laboratory work proceeded without untoward event. But then he upset a bottle of reagent over the chromatograph, and because he was unnerved by the black look the *diener* gave him, he tripped over his own shadow going out of the door and lurched against the model of the heme molecule that was used for demonstration purposes. It fell from its platform; the little plastic balls rolled in all directions. Dr. Morgan, running out of his office to see what the noise was all about, stepped on one of them, fell, and hurt his dignity.

George was a Job's comforter that evening. "I wouldn't blame Morgan if he told you to go elsewhere. As he asked, why do all these idiotic accidents happen to you?"

"I'm just unlucky, that's all."

"Luck! Chance! Accident! You sound like a superstitious savage! Next you'll be quoting Murphy's Law to me." George noted Peter's raised eyebrow.

"Murphy's Law. You know—if anything can go wrong, it will. There was a humorous article on it in last month's *American Chemical and Engineering News*."

To keep away from the laboratory and Dr. Morgan, Peter went the following day to the library to read the article. He smiled at the third corollary, sometimes known as the law of specific gravitation: "if a tool is dropped, it will land where it does the most damage." He doodled and day-dreamed. An inspiration came to him.

He wrote down a list of the ridiculous accidents he had had since the beginning of the academic year. He was appalled at the length of the list. Thirty-one accidents! He sat and thought for a long time before going back to search through George's books.

George returned from class. "What's up?" he asked.

"Serendipity," was the reply.

"What do you mean?"

"Serendipity—doing research in one direction and discovering something valuable but unrelated to the research. Like Fleming finding penicillin in the course of culturing bacteria."

"So what's your discovery?"

"Inverse serendipity. Me. I go to do something and something bad happens. An accident. Only you're right. It's not an accident. I cause it."

"You're nuts! Next you'll be saying you're a hoodoo. Come off it, Pete."

Peter shook his head. "No. I think I've made a find." He outlined his theory to George. "You know, there wouldn't be such universal acceptance of Murphy's Law if it didn't fit in with observations. It's not a joke. People wouldn't talk about hoodoos and jinxes and evil eyes without evidence they exist. Maybe people like me create a peculiar vortex in space and time around ourselves. Maybe we make things go wrong just by being there. Sort of an ESP, if you get what I mean, except it's not under our control."

Georgesnorted. "Apply Occam's razor. Accident-prone individuals get that way because of a psychologic disturbance in themselves. They punish themselves by getting hurt."

"You miss the point. I don't get hurt—not much anyway. But things and people (like Dr. Morgan) around me do."

"So prove that such a negative force exists."

"That's just it. It's hard to prove. Accidents can't be created to order. But there must be some way to demonstrate

the truth or falsity of my hypothesis. You're the expert on scientific method. Set me up an experiment along that line."

George thought a while. "Well, first do a statistical survey of those to whom accidents happen. Experiment can come later. I'll figure one out."

The next day, January fifteenth, he and Peter made the rounds of the university laboratories. They asked, pretending they were a safety committee, what accidents had occurred the day before, no matter how trivial. In the evening they compared notes.

"Chemistry Lab One: Mary Carr dropped a flask and cut her finger picking up the pieces. Chem Lab Two: Joe Palino sneezed and struck his head on the glass enclosing the balance, breaking it. Chem Lab Three: the sleeve of Tom Marsh's lab coat knocked over the row of bottles he had on his table. Biology Lab Two: Mike Czerny reached for lens paper and pushed the tray of microscope slides to the floor. Physiology Lab One: Hortense Plotkin upset a bottle of red ink over her completed kymogram. Biochemistry One: Claude Merrill mixed up his two blood unknowns in the qualitative test. Biochemistry Two: Matthew Long finished a quantitative urine analysis and then lost the slip of paper on which he had written the original volume. Genetics: Louis Pollock didn't notice he had jarred the gate separating the albinos from the black guinea pigs for the mosaic studies, thus permitting free copulation between the two groups. Physics Three: John Houseman's pen dropped into the centripetal force experiment cage and broke the fine wires supporting the steel balls. . . . ."

There was a total of sixteen accidents.

On February twelfth they did a similar survey. Again there were sixteen accidents but the coincidence in number was not the marvel.

"Look!" Peter showed George his chart. "Only four new names on my list."

"And only two on mine. That makes ten repeaters, not counting you." George shook his head in disbelief. "I think we've got something. Now for the next step. I'll take Joe Palino. You take Hortense Plotkin. That's a random enough selection to start with. Their last names begin with P."

Joe Palino, too, was a shlemihl. "My grandmother used to say I had the *mal occhio*. I have good muscle control but just the same when I hit a fly ball, it breaks a window or when I screw a nail in, the wood splits. At our last big family



dinner I was helping my mother. I brought in a big tureen of spaghetti and just as I was putting it on the table one of the handles broke and the spaghetti, sauce and all, spilled over everything."

Hortense Plotkin, a slim graceful girl, also admitted she was unlucky. "I can't tell you how many times I've cried about it. Last month I slammed the car door on my date's fingers. And the very next day I dropped an open bottle of nail polish over a brand new sweater." Tears came to her eyes. "I don't know what it is. I make things go wrong wherever I am."

She and Peter were sitting in a booth in the student lounge. "Don't worry," he said. "Things happen when I'm around too." On an impulse he reached out to pat her hand. He knocked over the

loosely. They made apologies, helped collect the books and papers, and walked more slowly to the Zeta Phi house. There while they stood on the steps saying goodbye, an avalanche of shifting snow slid off the slanting porch roof onto their heads.

George got excited when Peter told him what had happened. "Don't you see? Your theory about the vortex around you must be correct. The two of you had a whole series of accidents." He looked over the list of names. "Why don't you go to see Pollock tonight? That's the only other P. He's floor proctor in Woolrich Hall."

**P**eter knocked at the door of Pollock's suite, on the second floor of the freshman dormitory. The sound

it up and cracked their heads together. Peter turned and fled from the room. On the wooden stairs he slipped on a wet spot and finished his journey bum-pety-bump to the bottom.

George's enthusiasm rose. "See? The two of you together created disaster." A glow came into his eye. "Pete, you know I think we have the clue to what the guys at Duke call psychokinesis, the ability of humans to influence physical events. You can do it, Pollock can do it, the others can do it, but you don't know how. Maybe we can find out."

He got a set of Rhine cards. Nothing came of the experiments with Peter except for the hole burned in the rug when a cigarette fell unnoticed from an ash-tray.

Throwing dice was another matter.

If accident prone people actually exist, is there any concentration of them which will equal critical mass with critical results?



half-empty mug of tepid coffee and watched in helpless horror the brown liquid spread over the neatly typed pages alongside her.

"That's what I mean!" she wailed. "Now I'll have to redo that report and it's due tomorrow. Let's get out of here."

They walked across the snow-covered campus. An ice-encrusted branch of a tree snapped off as they passed under it, knocking them both to their knees. They got up and ran toward Sorority Row, hand in hand. They bumped smack into Dr. Barriwell, sending his books flying and the interleaved notes fluttering

startled Pollock, putting the finishing touches on the chromosome map he was making for his biology section; the marking brush smeared across it. "Come in!" he shouted angrily and turned quickly in his swivel chair, forgetting he had moved the bridge lamp close to the desk for better illumination. Crash! His head struck the lamp.

Peter entered and closed the door behind him a little too hard. The hanger holding a portrait of Father Mendel loosened; the picture fell to the floor. Fortunately the glass remained unbroken. Both Peter and Pollock went to pick

Peter's throws followed the normal distribution curve until they started playing for pennies. Then he rolled snake-eyes so often he gave up in disgust.

After his experiences with Hortense and Pollock, Peter refused to go on with the research. George went ahead, however. He interviewed the remaining seven on the list. Five were graduate students; two were undergraduates. Their biographies were astounding. Not only were they shlemihls but they were a special type of shlemihls. They were all bright; three were actually geniuses. They were not clumsy; one was a part-



time instructor in ballet at the Drama School, one had a hobby of sleight-of-hand. But all of them repeatedly mistook salt for sugar, dropped keys down gratings, used shaving cream for tooth-paste and aerosol furniture polish for hairspray, and worst of all—they often managed to inflict damage on whatever or whomever was nearby. Terry, for example, substituted medicated foot powder for the talcum when he changed his baby's diapers. And Giacobbe changed the rotor on the ultracentrifuge without noticing the pins were not in place, causing \$1400 worth of damage to the machine.

George invited all ten to join him in a study that would affect them personally. Peter came to the meeting reluctantly, only after George had agreed that

fearfully at each other and drew their chairs farther apart. A foot of Mary Carr's chair caught in a deep crack; it wobbled; to guard herself from falling she flung out her arms; the ball-point pen she was holding flew out of her hand to hit Terry's white shirt, streaking it.

George's next remarks kept them from leaving at that moment. "Once we know for sure that such a force exists," he said, "we can master it. 'Out of the kingdom of necessity into the kingdom of freedom' to quote Engels. Once man knew what gravity was, the way was open to overcome it for men to fly."

An excited babble broke out. One of the undergraduates, Merrill, sadly confessed he had been practically ostracized for what his classmates called oafishness. "But I'm not awkward," he explained.

three or more would get together, even more unexpected events would take place. We could grade those events on a scale and determine if the force increases by simple addition or exponentially."

"Just a minute," Tom Marsh interrupted. "Assuming that you're correct, how could all eleven of us ever get together? Unless you're proposing for us to join hands in the Kremlin or Peking."

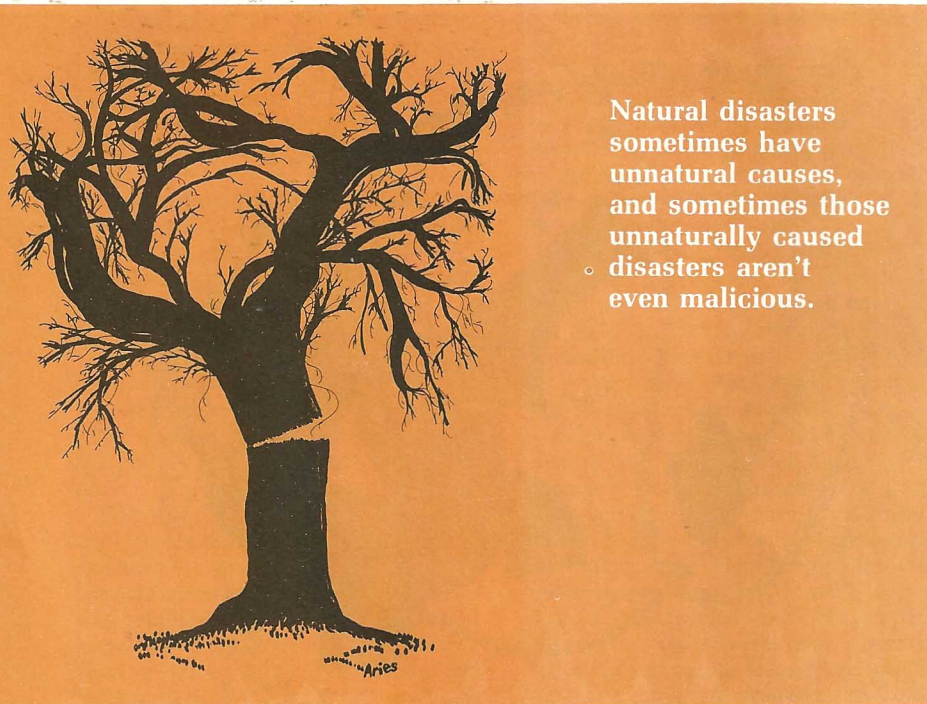
George licked his lips. "That is a problem. I've thought about that. We must go slowly. I suggest that first you arrange to meet in pairs in an isolated area, stay there an arbitrary minimum of an hour, and then separate. Record anything unusual. We'll meet here in a week and compare notes."

An uneasy silence pervaded the room. At last Houseman spoke up. "Count me out. You've convinced me. I don't want to risk any more trouble just for the sake of science. As the Irishman said, 'What did posterity ever do for me?'" Terry and Marsh also refused to join in the experiment. They got up to leave the room together. The door handle came off in Terry's hand. In helping him put it back on, Marsh put his hand through the upper glass pane and Houseman ripped his jacket sleeve on a projecting splinter.

The remaining eight moved farther apart. George made the assignments. "I suggest you leave one by one and make arrangements by telephone for your meeting place and time."

Only six showed up the following week. Pollock and Merrill were missing. George called Woolrich Hall and was told that Mr. Pollock was in the infirmary in traction for a broken leg. He phoned the infirmary and on a hunch asked how Merrill was. Merrill had been discharged the day before; he was in good condition, the fracture of the forearm in a cast. The nurse had no idea how he got it.

George suppressed the news. Giacobbe, a jazz fan, had come early for his meeting with Peter at the base of the Brewster Statue; he put the old 78 Fats Waller record he had just acquired on the ledge and sat down to wait. Peter came bustling up, said, "Sorry I'm late," and plopped himself on the record. End of record. End of meeting, for when Peter jumped up, Giacobbe's hand, hastily extended to save the record, met Peter's eye. The girls reported that Mary had caught her heel on an exposed root in the middle of the field where they met; she sprained her ankle and hobbling back to her room, leaning on Hortense, she had inadvertently tripped



Natural disasters sometimes have unnatural causes, and sometimes those disasters aren't even malicious.

those present would be at least five feet apart.

They met in a study hall. George sat up front before the charts of accidents, Peter's skewed dice-rolling curve, and Houseman's recent troubles (untightened lugs on a replaced tire—auto crash; stopped wristwatch—mistiming and ruining of flash-evaporator experiment; overturned ink eradicator bottle—bleaching and spotting of partner's slacks).

They listened with mounting interest as George put forth the hypothesis of negative psychokinesis. They looked

"They blame me if the frog dies or if I open a window and papers blow around or if my grapefruit spatters."

George held up his hand for silence. "First we have to determine how negative psychokinesis works. It must be a weak force because it doesn't always manifest itself. A small magnet, for instance, has a limited range of influence. But from evidence at hand"—here Hortense blushed and Peter coughed—"we can assume that the force can be strengthened by addition. If two of you were to be in close proximity, more incidents, shall we say, would occur. If



Hortense, who fell in a puddle. Palino and Czerny met in the hothouse adjoining the arboretum; they had neglected to read the note on the door and were both drenched when the automatic sprayer went on on time.

"There's not much doubt, is there?" George asked rhetorically.

"Two of you together practically insure damage." Czerny sniffled. "But it's not all gloom. Perhaps the force is neutralized by the presence of other people. The next test is three and three together, but in a crowded place."

"Not me," Palino said. "I've had it." He waved goodbye and left the room. He slammed the door behind him and a crack appeared in the newly installed pane of glass.

Despite their misgivings, the experimenters went on. The girls were to be joined by Peter; he also would form the third with Czerny and Giacobbe. "It's not a fair trial," George conceded. "Pete's force may weight our results, but we'll try to discount that."

Calamity followed catastrophe at the Blue Bottle, where Peter met Mary and Hortense for dinner. The Blue Bottle, popular with the college crowd for its informality and its good food, was jammed. Peter stood up from the table he'd found and waved to the girls. In doing so he upset the tray of dishes the busboy behind was carrying. Mary did not notice the residual glob of mustard on her chair when she sat down; Hortense, flustered, tried to remove the stain with her napkin and succeeded in knocking over the chair against the crutch of a departing diner. The top of the salt-shaker fell in Mary's soup; Peter's ketchup splattered over Hortense's cottage cheese salad; Hortense dropped cigarette ash into Peter's ice cream. She tossed her head; her fashionably long hair caught on the sleeve button of the waiter, who disentangled himself but not without spilling the water he was carrying. Mary shifted her chair to let the busboy mop up; it ended up resting on his big toe. Peter dropped the change he was counting out for the tip; getting up from picking up the coins, he backed into a student with an armful of leaflets for the anti-draft meeting, sending him to the floor and the leaflets into the air.

George had a great deal of trouble persuading Peter to meet Czerny and Giacobbe. "This could be known as the Harris Effect," he said. "Your name could go down in history."

"As what? Prize klutz?" Peter countered.

"As the discoverer of a psychic force that could revolutionize our lives once it's harnessed. Just consider—teleportation, levitation,—there's no limit." Peter gave in.

The trio met in the reading room of the library, crowded with students trying to catch up with their back work before the end of the semester. They sat side by side. They had agreed not to talk to each other for an hour and then leave separately. Each one made sure he had nothing spillable or breakable with him; each one busied himself with his notes and notebooks.

Giacobbe crossed his legs. His foot hit the shin of the girl opposite him. She glared at him. "Excuse me," he said, uncrossing his legs, banging her again. She said, "Clown!" arose, and left. Peter, trying to suppress his snicker at Giacobbe's discomfiture, began to cough; he reached for his handkerchief in his back pocket and felt a sharp prick at his shoulder. He felt for the sore area and found the cleaner's staple he had forgotten to remove. He got up and took off his jacket, spilling the loose change in the pocket in the process. Czerny, helping him retrieve the coins, bumped his head on the edge of the long table.

They settled down again. All was quiet in their vicinity until just before the hour was up. Peter got ready to leave. He stacked his books. The topmost book slid off and, as he described later to George, "it skittered diagonally across the table, messing up the neat piles of 3x5 cards a fellow there had just arranged, the notes for a paper. He got sore, jumped up, leaned across the table, and grabbed my necktie." Hot words passed. The security guard came running and collided with Giacobbe leaving. Giacobbe's notebook went sailing, hit a nearby student at the temple, and knocked off his glasses. Czerny stepped on them. He picked up the broken frame and stammered apologies. The unlucky myope swore at him. The noise level in that part of the room rose, attracting attention. Students, glad of a break, crowded around. The guard checked Peter's ID card, then those of the other two. The librarian-clerks shooed the curious back to their seats. The chief librarian came out and ordered the disturbers of the peace into his office.

About what happened there, Peter was incoherent later. "I don't even want to think about it," he told George. "all I can tell you is that a plaster bust of Aristotle got broken, a glue pot overturned, an old map was torn, a case of books fell over, Czerny tore a fingernail

off, Giacobbe ripped his pants, the librarian got a black eye, and I ran a splinter into my palm."

George was in stitches. "A slapstick comedy! The three of you could make a fortune in Hollywood!"

"Laugh all you want." Peter was furious. "This is the end. I don't want to see any of that bunch any more."

**S**.D.S., Black Power, and the War Resisters Union made a united front for confrontation with the Vice-President, the main speaker at the Alumni Day exercises. George and Peter had vantage points, sitting on top of the lion in front of the Administration Building.

The square before them was jammed. Signs and effigies abounded. TV crews were on hand, as was almost the entire student body. The United Front Against War and Racism was opposed by a smaller group of conservative students with their own banners. George nudged Peter. Merrill was amongst the Y.A.F.'ers. Almost simultaneously Peter saw Houseman and Czerny, unaware of each other's presence, separated by only a few students. He began to perspire and look for a way to escape but the crowd was too dense. A cry arose and all heads turned upward. A large poster of Che Guevara was being lowered from the roof of the building. All heads turned upward. Peter saw Mary Carr and, sure enough, Hortense Plotkin only a few feet away. Searching through the upturned faces, he found Palino and, to his horror, every other one of the original ten. What was worse, the press of the crowd was pushing them together.

The disturbance that followed the arrival of the Vice-President's car surpassed the riots at Berkeley and Columbia. Every window of the building was shattered; the official automobile was overturned and set on fire; the police swung their clubs; the students replied with sticks, stones, and fists; a Molotov cocktail was thrown at a TV camera. Blood dripped from cracked heads; screams and yells filled the air. The tear gas was ineffectual because of the sudden thunder shower that sprang up. The fighting continued through the downpour until a bolt of lightning struck the old oak tree opposite the building.

Peter visited George in the hospital. From underneath the bandages George whispered hoarsely, "I hope you're convinced now. You ought to send a paper to *Science*. Get priority. Only I'm not having anything further to do with the research. And do me a special favor, Pete. Find another room-mate." ○



# THE INHUMAN EXPLORERS

from page 23

distances involved create a subsequent time-lag in radio communications between Earth stations and the spaceprobe, so the probe must perform some of its own navigation. This capacity for internal decision-making becomes critical if the probe is supposed to make a gentle landing on the moon (as in the Surveyor series, 1966-1968) or on another planet (Mars in the case of the Viking series, 1976 and 1979). Then, the guidance mechanism must make literally thousands of correct decisions in seconds to descend safely to the surface.

This is an intricate maneuver, involving backing down using the probe's rocket thrust matched exactly against gravity so that zero mph is reached at ground level. Too much thrust and the probe runs out of fuel well above the surface. Too little power and it smashes down.

The computer that manages this tricky balancing act uses a landing radar system that converts signals bounced from the surface into altitude readings and then determines the right amount of rocket thrust. It is an incredibly complicated operation in practice, but the basic principle is quite old and simple. The principle of feedback was first employed by pioneer steam engineer James Watt in the mid-eighteenth century. Watt was bothered by the unreliable performance of his boilers—the pressure varied wildly and unpredictably and sometimes caused explosions that wreaked havoc not only on the boiler-tenders and bystanders but also on Watt's reputation. Watt eventually came up with a device that would regulate the boiler pressure within very close tolerances by allowing the steam pressure to run a whirling "valve." Using a system of swinging weights attached to the valve that rose and fell by centrifugal force generated by the rotation of the entire assembly, vents controlled by the position of the weights let excess steam escape before it built to dangerous levels. The same regulating concept keeps the landing speed of a robot spacecraft at a nearly constant rate.

**O**f course, neither a machine nor a man can maintain *any* action absolutely exactly. It is always a little shy or a bit over the ideal point, never hitting it dead on for any appreciable duration. A common example is driving a car down a long stretch of straight road: nobody holds the wheel in a locked grip, unmoving from the single position that points the car straight ahead. Instead, drivers turn the wheel a bit one way, then compensate a trifle the other, and correct for the slight deviation by turning

back a little in the original direction. The track of the car is actually a continuous series of slight oscillations, but the overall path is straight.

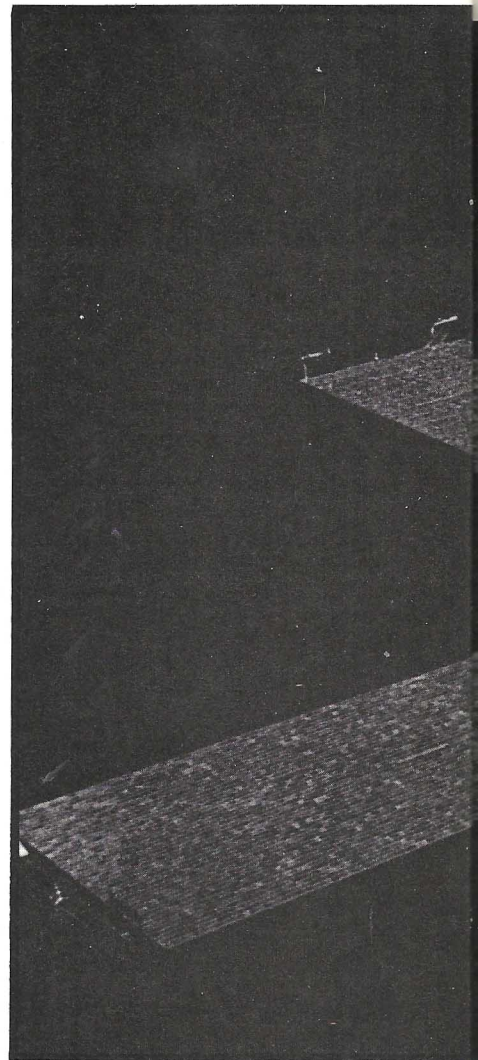
The term for this kind of phenomenon is "hunting." The most elementary example of it in electronic terms is the simple household thermostat, which regulates room temperature within a degree or so of a desired mark. A further step in the evolution of the "hunting" principle is its application in mechanical devices called servomechanisms. These machines not only "hunt" about a set mark, but can adjust themselves to reduce the amount of overcompensation and so approach more closely the specified point. A well-known use in industry of servo-mechanisms is in the remote-control handling devices nicknamed "waldoes," (after the title of a Robert Heinlein story that predicted their development) which enable workers to safely assemble and repair radioactive components.

When all of the sophisticated guidance techniques have taken the explorer probe to another world in space and either landed it intact or sent it flying by along the right course, there remains the problem of sending home the information gathered by the various sensing devices and instruments aboard.

For Goddard in 1920, that was no great challenge. He knew full well that neither instruments or radio transmitters of his glass tubes and spark-gap level of technology could withstand the crushing acceleration of a liftoff, or even more certainly the 5000 mph lunar landing he planned. Hence the flashpowder scheme.

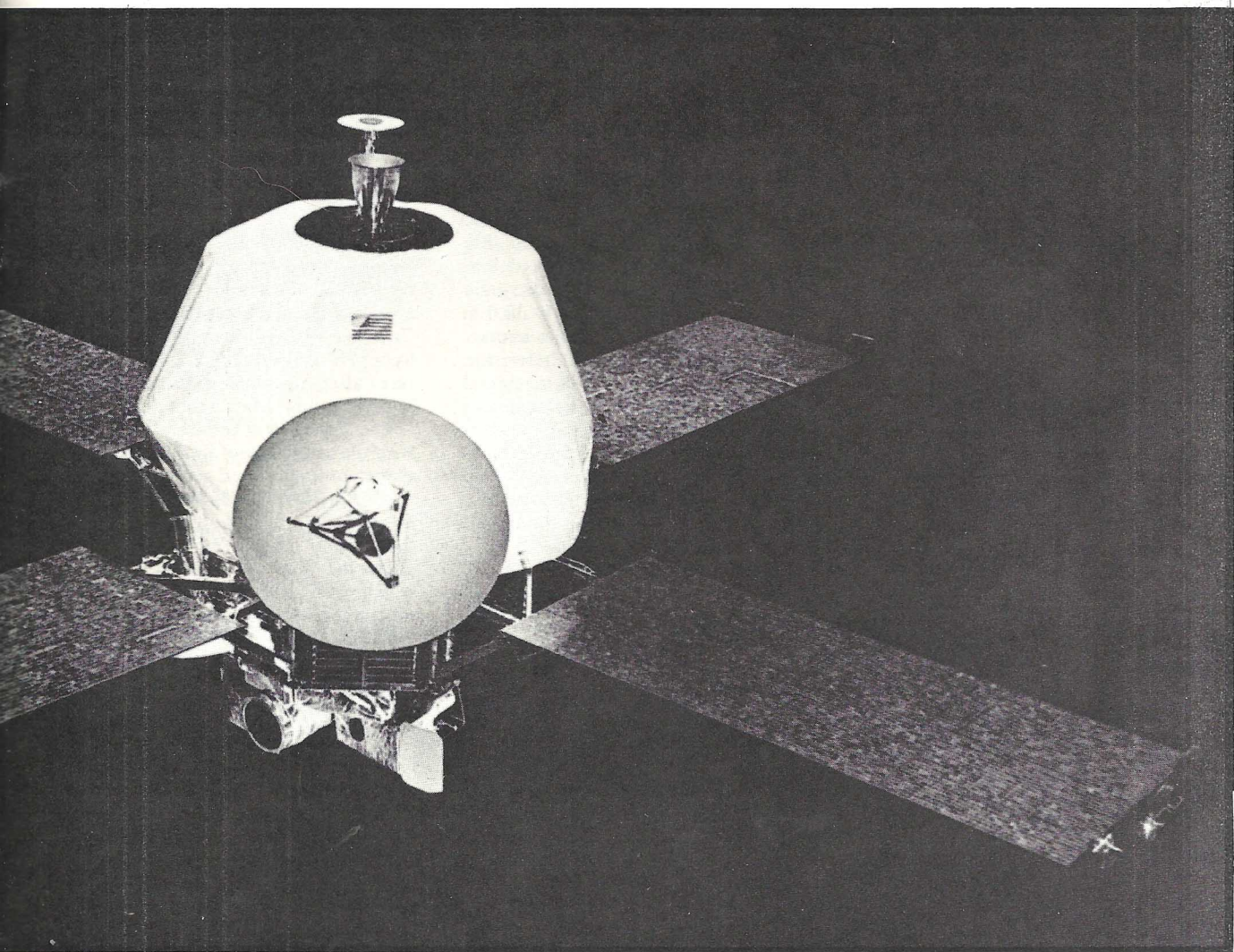
By the 1950s, everything had changed. Solid state transmitters built up from hardy transistors were equal to the fastest takeoffs and—in special circumstances—could live through a Goddard-style descent: the Russian Luna 9 arrived on the Moon traveling over 100 mph; it was a little bruised, but worked fine.

The problem of transmitting data back to Earth was overcome in several steps, beginning in the 1930s, when the U.S. Weather Bureau started sending aloft radiosondes—small balloons carrying barometers and other weather-metering instruments that return their findings via a single radio frequency in a kind of machine code. Over the years, this practice was refined into the modern science of telemetry. In its most basic form, telemetry involves converting the instrument readings into radio waves, each pulse of which is modified in accordance to the conditions being measured. For example, the high temperatures of a



***The 2200 pound Mariner spacecraft is shown with solar panels deployed. The white shroud covers the 300 pound thrust retro engine with the nozzle pointing out the top. The spacecraft measures 7½ feet from top to bottom and is 22 feet 7½ inches across.***





Martian noon could be indicated by pulses of correspondingly longer periodicity; when the temperature drops the pulses would be spaced shorter. Electronic systems on the spacecraft can take the signals from dozens of instruments and “weave” them into a single continuous transmission. On Earth, a corresponding computer separates the telemetry back to the original number of signals. In this manner, one small probe can gather and transmit millions of pieces of information without the need of recording everything and then returning the recording to Earth for analysis. The reverse method is used to send instructions to probe from Earthbound controllers.

**N**aturally, things don’t always work out this smoothly. The very nature of spacecraft construction techniques adds its own unpredictable element to unmanned missions.

Unlike most electronic gear, robot spacecraft are virtually handmade. Even probes that are supposed to be duplicates may bear only hazy resemblances to one another. Add to this the fact that the electronics are so tightly squeezed together to save space, and it’s little wonder that the probes occasionally act oddly. Former Deputy Director of NASA’s Manned Spacecraft Center Christopher Kraft once remarked that the various components in spacecraft often affect them in an “almost metaphysical” manner, endowing some craft with near-human personality quirks. One Soviet probe became increasingly irritable and unresponsive as it neared Mars and apparently shut itself off in a fit of temper. A U.S. craft on a similar mission was programmed to lock onto a particular star with an electronic sensor to help with navigation, but it picked the wrong star and then stubbornly ignored frantic instructions from Earth for

hours before admitting its mistake. And Surveyor 3 seemed to dislike the landing point on the Moon chosen for it, for as soon as the probe touched down it immediately gunned its engines and flew off to another location all by itself.

Despite their different shapes, sizes and psyches, robot probes may be divided into two categories: passive and active explorers. The distinction lies in the nature of their assigned missions. Passive explorers are simply reporters and observers, while active probes involve themselves in data collection and sometimes even return home with samples of what they have seen or felt.

The first passive spaceprobe was the first artificial satellite, Sputnik 1. It did nothing more than broadcast radio signals from orbit, thereby proving that radio works in space. In retrospect it wasn’t much of an accomplishment, but being first, it captured public attention like nothing since the atomic bomb.



A later and far more useful passive probe was Mariner 9, which departed for Mars on May 30, 1971, from Cape Kennedy. Going into orbit around Mars on November 13, 1971, Mariner 9 began the first continuous reconnaissance of another planet by means of two television cameras (wide angle and closeup) spectrometers (to determine the composition of martian soils and rocks and atmosphere) and an infrared radiometer to give an idea of the range of temperatures on the planetary surface.

For nearly a year, Mariner 9 reported back everything its battery of instruments could tell it about Mars, and in doing so it fundamentally altered our conception of that world. In thousands of photographs of mountains, valleys, deserts and cratered highland, Mars was revealed not as the dead, desolate place it had been thought of for a decade. Instead it was clearly shown to be a changeable, diverse planet, quite different from Earth, but containing many striking similarities, too.

Finally, Mariner 9's tiny attitude-control jets ran short of fuel, and gradually it began to tumble and its useful lifetime was over. It had provided enough data to keep astronomers and geologists busy for a decade, at least. Its death throes were watched over by only a few; public and scientific attention had shifted by then to an even more daring and ambitious robot explorer.

On March 2, 1972, Pioneer 10 was launched toward Jupiter, a voyage over twice the distance of Mariner 9's and one which would take it directly through the asteroid belt. In mid-winter of 1972 Pioneer 10 entered the region and emerged unscathed in spring of this year, still on a perfect trajectory to bypass Jupiter by 100,000 miles on December 4, 1973.

Although a close cousin in basic structure and design to Mariner 9, the Jupiter-bound probe has been altered to fit the conditions of the regions out beyond the orbit of Mars. The familiar solar-cell panels that furnished electrical current for Mariner 9 have been replaced in favor of thermoelectric generators powered by radioactive isotopes because the amount of sunlight near Jupiter is far too weak to charge solar cells. Two pairs of the generators are mounted on twin booms, an arrangement that keeps their radiation from interfering with the nest of instruments clustered in the center of the probe. At the tip of a third long boom is the spacecraft's magnetometer, which is expected to air astronomers who have been mystified by Jupiter's peculiar magnetic field. Recent observations have

discovered that it is unaccountably asymmetrical, almost as though it were sliding away from the planet. There is no explanation for this curious anomaly, but data from Pioneer 10 may provide some valuable clues.

The Pioneer spacecraft is also expected to return hundreds of high quality still photographs of Jupiter's turbulent surface to Earth as it passes overhead. If all goes well, it should also be able to give us our first close views of that awesome mystery, the Red Spot, a single rose-colored gas cloud nearly 30,000 miles in length and 8,000 miles across.

Instead of a conventional television camera system, Pioneer 10 is equipped with a more compact and reliable device called an imaging photopolarimeter that scans long, narrow strips of Jupiter in the blue and red wavelengths. Each strip is telemetered to Earth where a computer combines and enhances the signals to produce clear color prints.

In addition, scientists hope Pioneer 10 will be able to photograph several of Jupiter's family of twelve moons. NASA has several test shots scheduled as the probe rushes through the Jovian system. A follow-up twin, Pioneer 11, launched in April, will also attempt to shoot some of Jupiter's moons during its flyby in late winter of 1975. It also will check to see if there have been any significant changes in the Red Spot.

**F**or all their versatility, the Mariners and Pioneers are still passive explorer probes, limited to observations from deep in space, forever denied the opportunity for direct contact with the planets themselves. It is for this reason that the majority of NASA's funds for this decade's nonmanned space program is going for active exploration vehicles, aimed at discovering, once and for all, if life exists on Mars.

Active exploration of other bodies in space by robot probes began with the successful Earth-to-Moon flight of Surveyor 3, which was equipped with a mechanical arm and digging claw that proved that the lunar surface was mostly plain dirt. The next Surveyor analyzed the dirt and found marked similarities between it and terrestrial soil. A few years later, the Soviets landed a complex robot on the Moon that had the ability to scoop up several ounces of the soil and return it to Earth in a small re-entry capsule. The next major unmanned accomplishment was the successful Lunokhod 1, an unmanned roving vehicles that explored hundreds of miles of lunar terrain in 1971 under the partial guidance of controllers on Earth.

A similar series of active explorers is scheduled for Mars. The first probe to descend to the Martian surface was a relatively crude Russian machine that was unable to function in the high-velocity winds for more than a minute and so returned almost no usable data. Its failure has led to a general beefing-up of both the American and Soviet Mars landers.

The most sophisticated of these is the Viking, a two-section probe consisting of a robot biochemical laboratory and a powerful interplanetary relay station. Two such Vikings are due to be launched by a pair of up-rated Titan III boosters on or after August 11, 1975, and arriving in orbit around Mars about July 1, 1976.

The Vikings will be large, heavy craft, with the capability of performing close-in meteorological and geological inspection of the two landing sites NASA has selected before actually descending to the Martian plains. When the order is given, the Viking will detach its lander, which is similar to the Surveyor, but much more rugged. A streamlined aeroshell will protect the lander during the initial drop into the atmosphere. After it has slowed sufficiently, the lander will touch down using a combination of parachutes and retrorockets.

The two target sites are the lyrically-named Chryse, a highlands area in the southern equatorial belt, and Cydonia, a low rolling plain a thousand miles further south. After they alight the landers will begin transmitting television panoramas of the sites to the orbiters, which will then greatly amplify the signals and beam them to Earth. After a while the life-detection gear will be deployed around the lander. Three separate systems, amounting to a complete automated analytic lab, will test the soil for life: a sensing device will try to find signs of cell respiration from Martian microbes, another will react if photosynthesis is occurring, while a third can detect bacteria consuming specially-prepared food cultures aboard the lander. If life exists on Mars, as many scientists believe, Viking may well discover its presence long before men make the journey themselves to see it. In a way, Viking is a remarkable testimony to humanity's faith in its own mechanical and electrical creations, for a machine and not a man or a woman may well make the most far-reaching discovery of this century.

Even if Mars is not the abode of life, NASA plans to send another pair of Vikings to Mars in 1979 to capitalize on the findings of the first two. Five years later the Space Agency intends to land



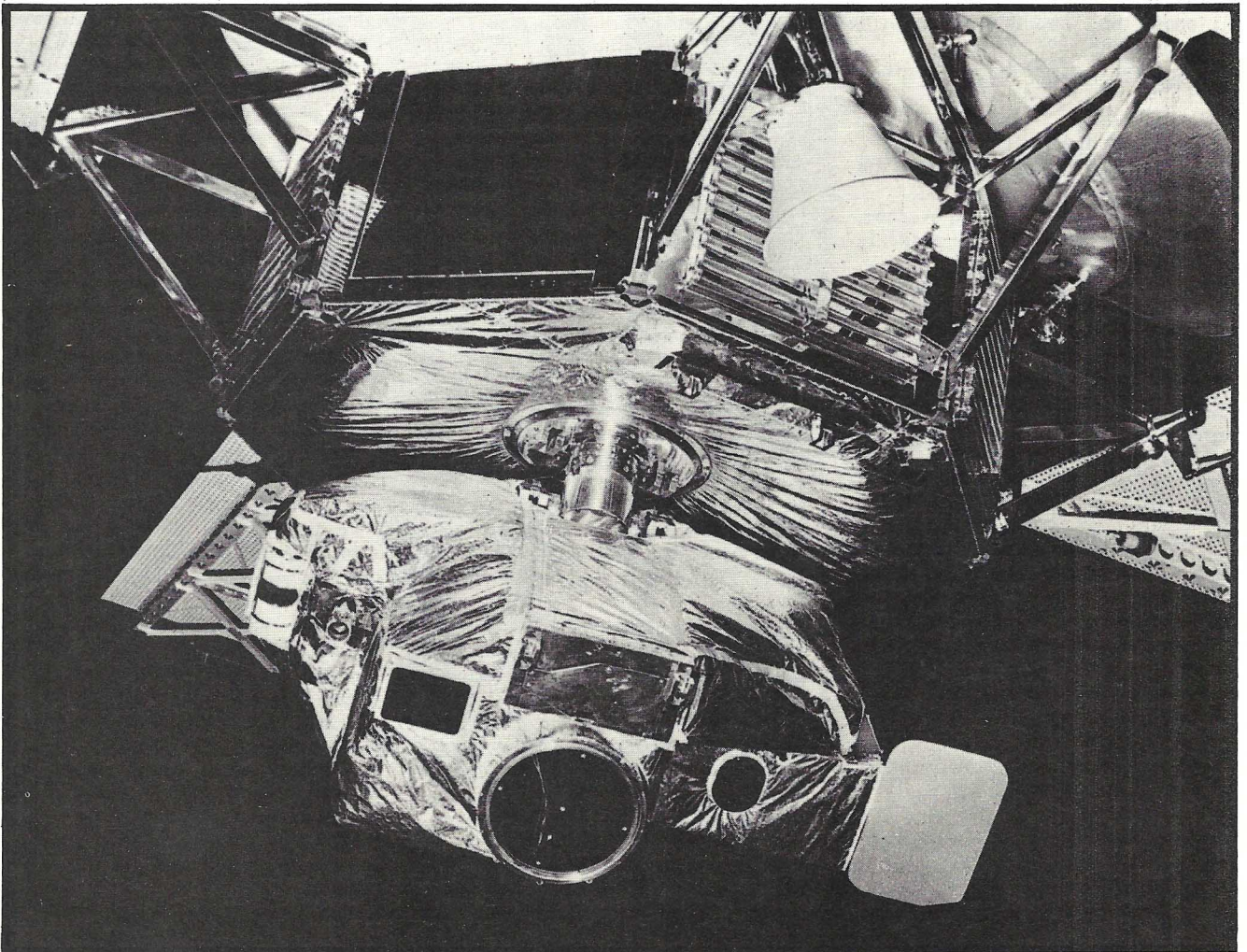
**Mounted on a movable platform, Mariner's instruments were able to map the topography, composition and temperatures of the Mars surface and atmosphere. The large center window protects the TV camera; to the right is the infrared spectrometer, and to the left are the UV spectrometer, wide angle TV camera and radiometer.**

a roving vehicle capable of independent action there where the time-lag in radio messages can be minutes long. Of course, the Russians, who have ample experience in this area, can be expected to deposit a Lunokhod-type rover on Mars much sooner, perhaps even a robot with return-trip capabilities that can return with a sample of that world.

By that time more probes should be venturing out into the solar system in both directions from Earth. This year a NASA Mariner will fly by Venus and Mercury; others will be aimed for the outer reaches of the solar system: Saturn, Uranus, Neptune and Pluto will undoubtedly be attempted by the end of the century. And if fusion power is perfected quickly (a recent Soviet-American pact pledges mutual support in fusion research), the means will exist for sending robot probes to the nearby stars. Perhaps the centennial of Sputnik may be marked by the first flight of such a craft toward the triple-star system of Alpha Centauri.

Then again, it might never happen. Various commentators have suggested that the current hiatus in manned space exploration signifies a deeper movement away from the scientific tradition to a preoccupation with strictly Earthly problems and delights. If this is correct, then unmanned probes may be the only real explorers for many years, until the tide of interest turns again.

In the novel *The City and the Stars*, space age historian Arthur C. Clarke examined this possibility, imagining an introspective future society that had neglected the universe for uncounted centuries. At long last a few persistent and curious people roused it from its narcissistic slumber and revealed the immense potential awaiting beyond the confines of Earth. As a symbol of its reawakened interest and intent, mankind sent a robot-guided ship out to chart the way, where, Clarke concluded, "... the stars were still young and the light of morning lingered; and along the path he once had followed, Man would one day go again."





# HEISENBERG IS DEAD

from page 27

doctors. My father is a noted healer and white-spell-caster in our region. He has even ended droughts."

True, as far as I know. I once saw him curse a Portuguese slave trader to death, by God, I did!

M'Lord didn't stir, save for rolling those dice from hand to hand.

"Had not the missionary taken me from my village I would, perhaps, be even now taking my father's place as a witch doctor."

"You already have," said Sir Hans, quietly.

"What?" My black jaw dropped open again.

Hans Albinger thrust back his chair suddenly and stood, his face in gloom above the desk lamp. "Yell me a number!" he shouted. "From one to twelve! Yell it!"

I said, astonished, "Six."

"I said yell it!" he boomed.

"Six," I shouted.

He threw the dice onto the carpet at my muddy feet and they rolled against my boots, three and three. Numbly I picked them up.

"Another number, Loamba! Quickly!"

"Four," I said.

"Throw the dice!"

Weakly, I spilled them out across the rug. Three and one.

"Again!" The old man bent over me, tall as a black herron, savage suddenly and frightening.

"Seven," I whispered and threw the dice. Four and three!

"Eight," I said. Five and three!

Sir Hans took the ivory cubes from my shaking hand and put them in a drawer of his desk. He mixed another drink while my mind reeled chaotically.

I took the glass he thrust at me. Then, gently, he said, "You're a TK. You're the result of thousands of years of selective breeding. Witch doctor spawn. You manipulated molecules of DNA and RNA by the power of your mind, son . . . not with any feeble magnetic probes."

"God help you," he said. "I don't know what to tell you to do with your tele-kenesis, but it can't belong in the laboratory. You understand that, don't you, Loamba?"

I understood. I believed. I left, dimly glad of the rain that pounded me.

**M**y gentle father, N'ememba, was dead a month when I arrived in Africa. I heard this in Durban, such was his fame, on my arrival by BOAC.

I set forth to my home as I thought

a proper son should, clad only in the pants to my seersucker suit, barefooted (my great caloused feet rejoicing in morning's cool dust) I strode along the uplands road with but a staff and sling of mealie-meal about my shoulder.

Days and cold nights went by, numbly, dumbly, mumbly, and the game showed increasingly along the road-become-trail. By now, only a Land Rover or two dared to out-span the track. I was a day away from my people when my younger brother stepped out of tall grass and opened his arms to me. "Bama," he said, using our secret child-word for me. "We have been waiting." I hugged him, the both of us weeping, the Oxford part of my mind wondering how the Christ he knew I was coming.

I was home.

Relatives pressed drinks upon me, potent native beer with bugs in it, sweeter by far than the finest mead in the flossiest pub in Soho. I was embraced again and again. I wept as often.

Thomas Wolfe was an awfully wrong ofay. You can come home again.

My grandfather, Jumalah, had arisen from his retirement upon the death of his son, and after I had been feted for two days, he sent for me. The little virgin who trotted to me with the summons, a carved black stick with the *Fisi* totem dangling, looked oddly like a dark and dusty Edith Piaf, but I bade her ceremonial welcome, as befitted an acolyte of a Great Worker. I gave her beer and the use of my hut while I read my grandfather's markings. Piaf kept slitting her eyes at me as she sipped from the gourd.

The signs in the stick said simply, but untranslatably, "My welcome, son of my son. See me when you are ready."

I was ready. Tomorrow I would travel, but to forget the curse of my unwanted talent, I turned to the girl. At the peak of ecstasy she drummed her heels in the dirt of my hut and screamed and giggled. I could not forget, nor was she a virgin.

**J**amula, my grandfather, lived in a dirty cave a day's march from the village. It was decorated at the entrance with many old human skulls stuck atop twigs and sticks. A flowering ivy twined through them, interlacing empty sockets and jaws with grotesquely beautiful purple blossoms. I bowed low at the arched doorway. "Enter," came the resonate voice from within.

He sat in gloom before a stinking dung fire, the precious magical trash of his profession strewn about him . . . a withered dog head, bits of broken glass,

earthen pots and bowls of God knows what nauseous mixtures. He weighed perhaps three hundred pounds, a plum black, glistening Buddah. His eye sockets were empty . . . I had forgotten the old man was blind, and you know what, man? He fairly radiated power!

Ritually, he began. "When you were young, my son, what did we do to you?"

"Mighty father of my father, you brought me to manhood."

"How did we do this, Loamba?"

"You prepared me with incantation. You anointed my skin with oils of great strength and courage." I recalled it all strongly now, and I began to sweat with fear at the memory. My manhood ceremony had consisted of thrusting me into a wooden cage with a young, desperate hyena, and when we had both drawn blood I was adjudged worthy of my clan.

The old man broke off and sucked at his toothless gums for a time. "Then why," he said at last, "have you returned? To give up the ways of the whites, the tomingani? To take your rightful place with the tribe?"

"No, Grandfather. I would rid myself of the wild talent in my blood. It has cost me my position with the tomingani, it has brought their laughter upon my name."

"Ahhh!" A long, long sigh, carefully unexpressive.

The next half hour went by in silence. I would not speak before he did! Then at last, "It shall be as you say, but I grieve even now for your loss."

"I have made up my mind, grandfather. I do not wish witch power. I am too far from this world. I would make my home with them."

Again the old man sighed. "So much could be yours, my son. I grieve for you, but you are a man and the choice is yours. Tomorrow we take the gift from you."

Yeah, They took the gift. They took it and most of the muscle of my right arm, my left leg. And sometime, somehow, during the screaming terror of my fight with a gigantic *Fisi*, the gift of TK was erased from me . . . in part, at least.

Know what they did, man? I was thrown into a wooden cage against my will, half drugged by something nasty that old Grandfather had put into my beer. For minutes I raged about the tough stick walls of the arena, hoping to find some crack I could tear open, then they goaded in *Fisi*. He and I stared at each other, then he stalked me.

And he lunged . . .

Aieee, God, father . . . the pain as his fetid snout ripped the skin from my



face, my arm . . . the claws of this demon *Fisi* ripping the flesh of my belly and legs . . .

At last I was thrown a knife and with it I drove off my enemy.

Later, somewhat recovered, I made the long trek back to Durban and took work in the National Science Academy there . . . as a nigger porter, and once . . . when no one was about . . . I got at their electron microscope and tried to move molecules with the power of my mind. But the witchgift, the TK was gone.

Sure, I can still manipulate dice or the wheel and ball of roulette, but is this why I am Ben Loamba, Ph.D., Fellow

Royal Academy of Science?

So once a month or so, I hobble onto the Greyhound and ride from Watts to Las Vegas or Reno. I am not greedy there, taking out just enough money to buy my scant food and my much drink for the next thirty days. Sometimes, just to be safe, I lose a little.

For already I have lost so much I can lose no more.

The moon is out full tonight. I lumber into the yard behind my wretched shack and sit amidst old auto tires and scraps of boards and cars and think of my Africa and of my brother, *Fisi*.

And drink. Here in Watts.

For Heisenberg lives! ○



***The answer he sought was in his past, in his childhood. The big question was, though, could he survive finding the answer?***



# BLACK DYNAMITE FROM HOLLOWAY HOUSE



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**BH417—\$1.50**

### TRICK BABY The Story of A White Negro

Author Robert Beck, better known by his ghetto pseudonym "Iceberg Slim" here tells the story of a blue-eyed, light-haired, white-skinned negro called "White Folks"—the most incredible con man he had ever met. White Folks could have passed in the white world but stayed in the black ghetto of southside Chicago through his childhood, his teens and young manhood. He stayed, even though he was tormented with the hateful name "Trick Baby," the name for an illegitimate child born to a Negro mother by a white father. He stayed because he became fascinated by the thrill of the con game, an exacting science for luring victims into traps baited with words, illusions and greed. In this book Robert Beck does a masterful job, creating a vivid portrait of this segment of ghetto life, capturing the heart-pounding suspense of the con game struggle between spider and fly.

**BH416—\$1.50**

### THE NAKED SOUL OF ICEBERG SLIM Autobiography and Reflections

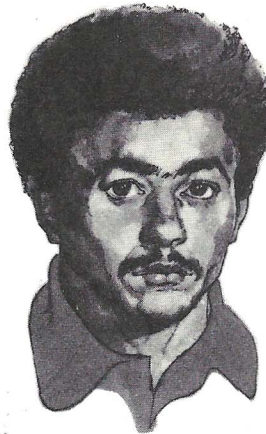
Don't cry for his soul because he's Black. Though Black is pain, Black is death. Black is despair. Black is the ghetto where he was born. And lived. As a pimp, dope addict, brutalizer of women—and other Blacks. But he cured himself of the ghetto rot to write—as no other man ever has—about his ghetto name Iceberg Slim. His first three books brought him fame, PIMP, The Story of My Life, TRICK BABY, The Story of A White Negro and MAMA BLACK WIDOW, a tragic, bitter family portrait. They were honest books—sensitive portraits of ghetto life and people. But his new book, THE NAKED SOUL OF ICEBERG SLIM is his most disturbing. Because it has hope, because he searches his artist's soul in a collection of personal essays that are full of passion and razor sharp perception. And when his soul is naked, you see the hurt of a man who feels too much and cares too much. This is a great book. Read it.

**BH414—\$1.50**

### MAMA BLACK WIDOW

Author Robert Beck, better known by his ghetto pseudonym "Iceberg Slim," here tells the story of Otis Tilson, an incredibly comely and tragic homosexual queen. The dialogue is in the gut idiom of the queer—the black ghetto—the deep south—the underworld—the world of Iceberg Slim, Otis Tilson and his family. It is the story of black men living in ghetto torture chambers. Men who have been and continue to be niggerized and deballed by the poisonous pus of double standard justice, racial bigotry and criminal economic freeze-out. And the price paid by their children. In this case, Otis Tilson, his older brother and two beautiful sisters adrift in the dark world of primpdom and crime and violence where good is condemned and evil applauded. This is by far Robert Beck's most vivid portrait of ghetto life . . . and most important. A masterpiece!

**BH415—\$1.50**



## DONALD GOINES

### DOPEFIEND The Story of A Black Junkie

Donald Goines is a talented new writer who learned his craft and sharpened his skills in the ghetto slums and federal penitentiaries of America. DOPEFIEND is the shocking first novel by this young man who has seen and lived through everything he writes about. DOPEFIEND exposes the dark, despair-ridden, secret world few outsiders know about—the private hell of the black heroin addict. Trapped in the festering sore of a major American ghetto, a young man and a girl—both handsome, talented,

full of promise—are inexorably pulled into the living death of a hard-core junkie. DOPEFIEND is an appalling story because it rings so true. It is also a work of rare power and great compassion. DOPEFIEND will draw you into a nightmare world you will not soon forget.

**BH419—\$1.50**

### WHORESON The Story of A Ghetto Pimp

In WHORESON, his second published novel, Donald Goines, author of Dopefiend, takes the reader into the violent world of ghetto prostitution. Whoreson Jones, the novel's hero, is a "trick baby," child of a beautiful black prostitute and an unknown white John. As he grows to manhood in the slums of Detroit he becomes adept at the skills of conning, thievery and street fighting needed to survive in the black underworld. By the age of sixteen he is a full-fledged pimp, handsome, cold-blooded, ruthless. Goines describes with power and compassion Whoreson's odyssey through a world of sudden violence, knifings, beatings, rape of fierce, often brutal sex; of treachery and betrayal. Written in the gritty street talk of the ghetto, WHORESON affords a startling glimpse into the hell of the inner city, yet it bristles with bitter humor and the defiant pride of a people with their backs to the wall.

**BH421—\$1.50**

### BLACK GANGSTER

Donald Goines, who probed the soul of the black junkie and the ghetto pimp in Dopefiend and Whoreson, now lays bare the shocking, uncharted world of black organized crime. BLACK GANGSTER throws a harsh spotlight on the violent beginnings of an empire of crime as it chronicles the rise of Prince, a fledgling black "godfather," from a teenage ganglord to a powerful Detroit mobster. Like the gangsters of the Twenties, also members of deprived ethnic groups, he begins with bootlegging (illegal sales of corn liquor are a major source of underworld income in the ghettos) and branches out into dope, prostitution and protection rackets. BLACK GANGSTER is especially relevant now that the nation's metropolises



are witnessing a resurgence of youthful street gangs. America's history of syndicated crime may be repeating itself in the inner cities. Donald Goines here presents the bloody, brutal facts.

**BH422—\$1.50**

## STREET PLAYERS

### The Story of Earl The Black Pearl

This is Donald Goines' fourth novel, a gutsy account of an Inner City gold-hatted, high-bouncing lover. And herein, Goines tests the tensile strength of a ghetto spawn who clawed his way to the top and fights like hell to stay there. He's known as Earl the Black Pearl, and he's up from the ghetto-way up. He views the streets from his fashionable penthouse with its wall-to-wall silk suits and women. He's everybody's mellow fellow, a big spender, the toast of the Inner City. He's as cool and sharp as an ice crystal. Even Joe Chink can't touch him. Then somebody put the heat on. Butcher knives flash and pistols bark, and Earl's friends begin dropping like flies, dragging Earl with them. But he's resilient and he bounces back—for a while . . .

**BH430—\$1.50**



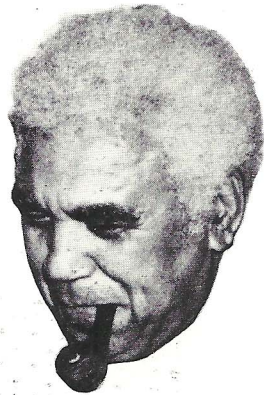
## ODIE HAWKINS

### GHETTO SKETCHES

Odie Hawkins, a native of the ghettos of Chicago, paints pictures of life and death in the Inner City in this, his first novel. GHETTO SKETCHES teems with the sights, sounds and smells of the "main stem" . . . the rat and roach infested tenements, the jazz-filled freedom of Saturday night, the soulful peace of Sunday morning. Hawkins has filled his canvas with unforgettable people, not

just the dopefiends, pimps, hustlers and other victims of exploitation, but the plain working people, indomitable survivors of injustice, and the young militants who are daily reshaping the Black Experience. GHETTO SKETCHES is more than a panorama of street life, it is a powerful indictment of the existence of the Inner City, that black colony sealed off and segregated from the white population of every large city, "a reservation, a Bantustan that is politely not called that, ghetto is more acceptable." This unforgettable first novel places Odie Hawkins in the forefront of black writers.

**BH425—\$1.50**



## JAMES M. JONES

### STRUGGLE FOR SURVIVAL

Since his university days in the 30's, James M. Jones has been prying open doors long closed to blacks. And STRUGGLE FOR SURVIVAL is a record of his experiences. Whether you're an advocate of violence or of passive resistance, Mr. Jones has something meaningful to say to you, a perspective worthy of contemplation. Mr. Jones was instrumental in seating the first black president at Howard University; he confronted labor leaders and forced unions to accept black members; he has led fights against racial discrimination on city, state, national and international levels; and as president of the American Advancement League, he has been responsible for the job placement of more than five thousand black members. He's not a follower, he's a leader; he's been fighting the civil rights battle on his own terms

all of his life. And as his friend Thomas Yangha, a former emissary to the U.N. from the Congo, states in his foreword: ". . . one must read this book!"

**BH428—\$1.50**

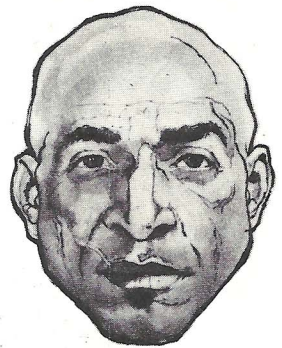


## JON PALMER

### HOUSE FULL OF BROTHERS

Steven Walls blew into LA from Omaha seeking his California Dream: membership in a black fraternity, an education, a prestigious job—and a white woman. That's what it took to make it in the white man's world, Steven thought. And that's exactly what he got—until he was booked for a bank robbery and murder he didn't commit, and Walls came tumbling down. In this, his first novel, author Jon Palmer probes black fraternities and the manners and mores of "white-conscious" middle-class blacks. And he does so incisively.

**BH429—\$1.50**



## ROBERT H. deCOY

### COLD BLACK PREACH'

In COLD BLACK PREACH', Robert H. deCoy, noted author of the explosive bestseller THE NIGGER BIBLE, takes on the Black Preaching Establishment. Tracing the Black church in America from its origin as an instrument of oppression in the hands of the slave owners, deCoy fires a powerfully documented broadside at the "Holy Man and his Holy Pole," the Black preacher is still Whitey's flunky, a "head nigger" hired to keep peace between the white exploiters and their Black victims. In a devastating section called "Saving Graces," deCoy exposes the hustles used by the Black Preach' to line his own pockets and keep his "flock" submissive. COLD BLACK PREACH' is a time bomb of a book. It will explode with savage force the hypocrisies of both Black and White establishments.

**BH420—\$1.50**

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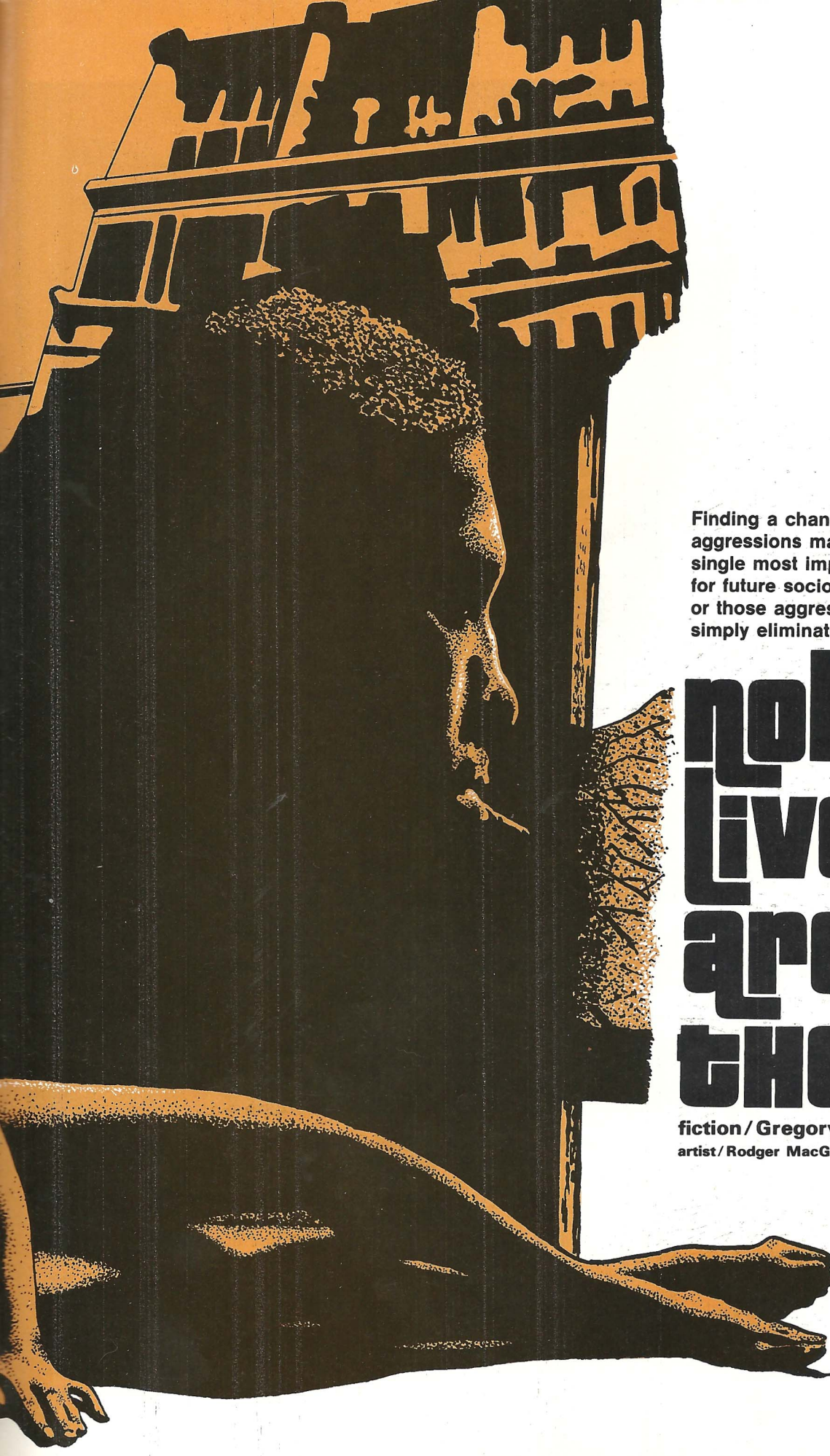
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ROGER MCGOWAN





Finding a channel for man's  
aggressions may be the  
single most important goal  
for future sociologists,  
or those aggressions may  
simply eliminate the future.

# nobody lives around there

fiction / Gregory Benford  
artist / Rodger MacGowan



was standing by one of our temporary command posts, picking my teeth after breakfast and talking to Joe Murphy when the first part of the Domestic Disturbance hit us.

People said the summer of '78 was the worst ever, what with all the pollution haze and everything kicking up the temperature, but here it was a year later and getting worse than '78. Spring had lost its bloom a month back and it was hot, sticky—the kind of weather that leaves you with a half-moon of sweat around your armpits before you've had time to finish morning coffee. The summer heat makes for trouble, stirs up people.

I was getting jumpy with the waiting. I walked back toward the duplex apartment set away from the street, trying to round up my men. The apartment was deserted, of course, so I wasn't listening for anything special from the bedroom. I walked right in on them.

Johnson, a kid from the other side of town, was sprawled across the bed with a skinny little black girl. She was sobbing, her eyes rolled up.

Yeah, I knew that one; rolled with her a few times myself last year. She was a groupie, really, always following our squads around with that hungry look in her eyes. She just liked to hump the boys, I guess, like some girls go for Marines. She had her skirt bunched up around her waist while Johnson was working on her. They were really going at it.

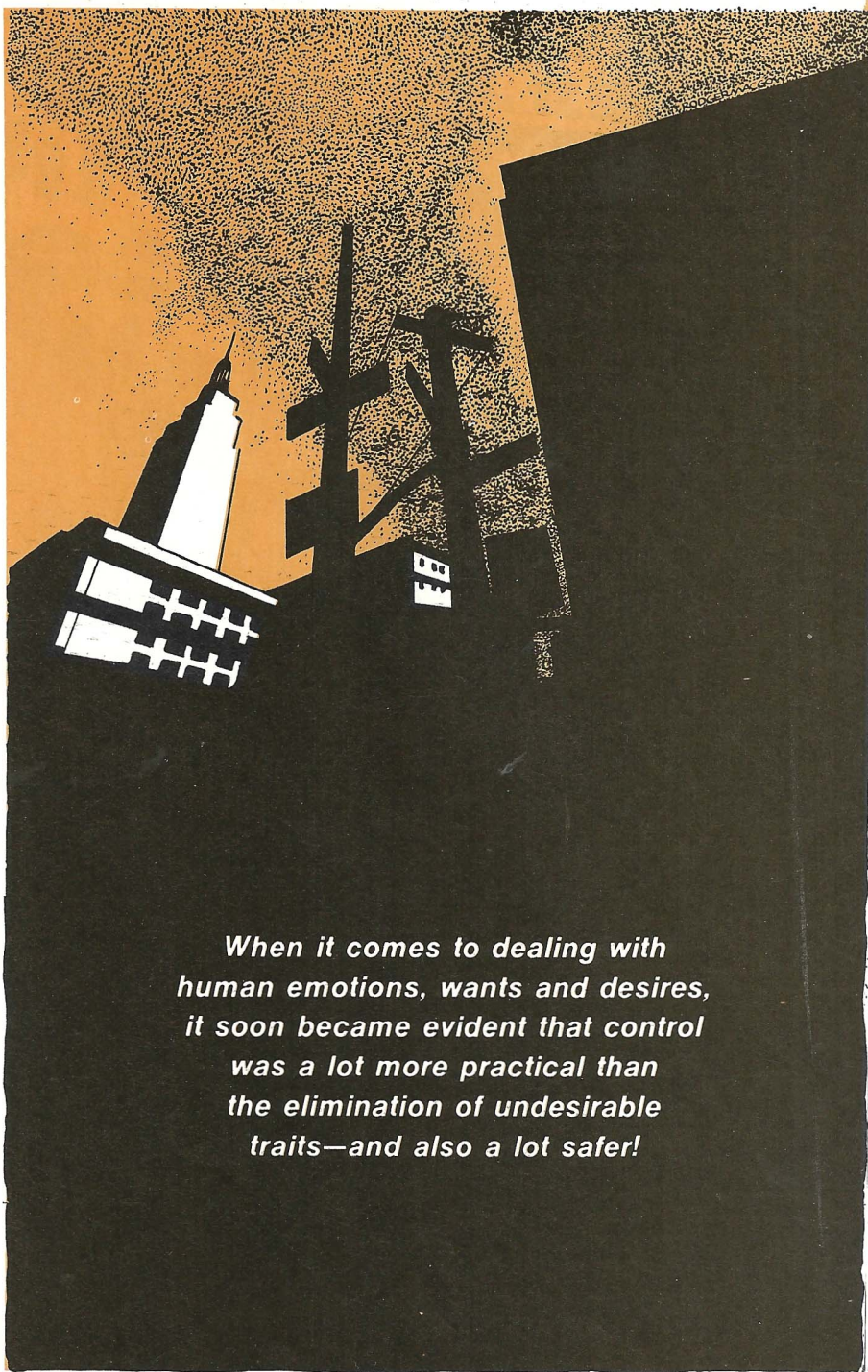
"Okay, fun's over," I said, and gave Johnson a light kick in the butt. "Finish it off and form up."

"What th—" he said as he rolled over, still clutching her to him. Then he saw me and shut up. The girl—Melody, I think her name was—looked at me with big round eyes and squirmed all over Johnson, getting him to hurry up. I made a mental note to get back to her one of these days; she was skinny, but she had a good way of twisting around that really got me off.

I turned and walked back out onto the roof where we had our command post.

**W**e knew the mob was in the area, working toward us. Our communications link had been humming for the last half hour, getting fixes on their direction and asking the computers for advice on how to handle them when they got here.

I looked down. At the end of the street were a lot of semi-permanent shops and the mailbox. The mailbox bothered me—it shouldn't have been there



*When it comes to dealing with human emotions, wants and desires, it soon became evident that control was a lot more practical than the elimination of undesirable traits—and also a lot safer!*

From the other end of Burton Street I could hear the random dull bass of the mob, sounding like animals.

We started getting ready, locking up the equipment. I was already working up a sweat when Joe came over, moaning about the payments on the Snocar he'd been suckered into and I was listening with one ear to him and the other to the crowd noise that was coming down Burton Street.

"And it's not just that," Joe said. "It's

the neighborhood and the school and everybody around me."

"Everybody's wrong but Murphy, huh?" I said, and grinned.

"Hell no, you know me better than that. It's just that nobody's *going* anyplace. Sure, we've all got jobs, but they're most of them just make-work stuff the unions have gotten away with."

"To get a real job you gotta have training," I said, but I wasn't putting the block on him. I like my job, and it's



better than most, but we weren't gonna kid each other that it was some big technical deal. Joe and I are just regular guys.

"What're you griping about this now for, anyway?" I said. "You didn't used to be bothered by anything."

Joe shrugged. "I dunno. Wife's been getting after me to move out of the place we're in and make more money. Gets into fights with the neighbors." He looked a little sheepish about it.

"More money? Hell, y'got everything you need, we all do. Lot of people worse off than you. Look at all those lousy Africans, living on nothing."

I was going to say more, maybe rib him about how he's married and I'm not, but then I stopped. Like I said, all this time I was half-listening to the crowd. I can always tell when a bunch has changed its direction like a pack of wolves off on a chase, and when that funny quiet came and lasted about five seconds I knew they were heading our way.

"Scott!" I yelled at our communications man. "Close it down and get a final printout."

Murphy broke off telling me about his troubles and listened to the crowd for a minute, like he hadn't heard them before, and then took off on a trot to the AnCops we had stashed in the truck below. They were all warmed up and ready to go, but Joe likes to make a final check and maybe have a chance to read in any new instructions Scott gets at the last minute.

I threw away the toothpick and had a last look at my joints, to be sure the bulletproof plastiform was matching properly and wouldn't let anything through, and Scott came doubletiming over with the diagnostics from HQ. The computer compilation was neat and confusing, like it always is, but I could make out the rough indices they'd picked up on the crowd heading our way. The best guess—and that's all you ever get, friends, is a guess—was a lot of Psych Disorders and Race Prejudice, but there was a fairly high number of Unemployed, too. We're getting more and more Unemployed in the city now, and they're hard for the Force to deal with.

I penciled an *ok* in the margin and tossed it Scott's way. I'd taken too long reading it; I could hear individual shouts now and the tinkling of glass, so there wasn't much time left. I flipped the visor down from my helmet and turned on my external audio. It was going to get hot as hell in there, but I'm not chump enough to drag around an air conditioning unit on top of the rest of my stuff.

I took a look at the street just as a gang of about a hundred people came around the corner two blocks down, spreading out like a dirty gray wave. I ducked over to the edge of the building and waved to Murphy to start off with three AnCops. I had to hold up three fingers for him to see because the noise was already getting high. I looked at my watch. Hell, it wasn't nine AM yet.

Scott went down the stairs we'd tracted up the side of the building, and I was right behind him. It wasn't a good location for observation now, and you made too good a target up there. We picked up Murphy, who was carrying our control boards, and all three of us angled down the alley and dropped down behind a short fence to have a look at the street.

Most of them were still screaming at the top of their lungs like they'd never run out of air, waving whatever they had handy and gradually breaking up into smaller units. The faster ones had made it to the first few buildings.

A tall Negro came trotting toward us, moving like he had all the time in the world. He stopped in front of a wooden barber shop, tossed something quickly through the front window and *whump!* Flames licked out at the upper edges of the window, spreading fast. An older man picked up some rocks and began methodically pitching them through the smaller windows in the shops next door. A housewife clumped by awkwardly in high heels, looking like she was out on a shopping trip except for the hammer she swung like a pocket book. She dodged into the barbershop for a second, didn't find anything and came out. The Negro grinned and pointed at the barber pole on the sidewalk, still revolving, and she caught it in the side with a swipe that threw shattered glass for ten yards.

I turned and looked at Murphy. "All ready?"

He nodded. "Just give the word."

The travel agency next door to the barber shop was concrete-based, so they couldn't burn that. Five men were lunging at the door and on the third try they knocked it in. A moment later a big travel poster sailed out the front window, followed by a chair leg. They were probably doing as much as they could, but without tools they couldn't take much of the furniture apart.

"Okay," I said. "Let's have the first AnCops."

The thick acrid smell from the smoke was drifting down Burton Street to us, but my air filters would take care of most

of it. They don't do much about human sweat, though, and I was going to be inside the rest of the day.

Our first prowl car rounded the next corner, going too fast. I looked over at Murphy, who was controlling the car, but he was too busy trying to miss the people who were standing around in the street. Must have gotten a little overanxious on that one. Something was bothering his work.

I thought sure the car was going to take a tumble and mess us up, but the wheels caught and it rightened itself long enough for the driver to stop a skid. The screech turned the heads of almost everybody in the crowd and they'd started to move in almost before the car stopped laying down rubber and came to a full stop. Murphy punched in another instruction and the AnCop next to the driver started firing at a guy on the sidewalk who was trying to light a Molotov cocktail. The AnCop was using something that sounded like a repeating shotgun and the guy with the cocktail just turned around and looked at him a second before scurrying off into a hardware store.

By this time the car was getting everything—bricks, broken pieces of furniture, merchandise from the stores. Something heavy shattered the windshield and the driver ducked back too late to avoid getting his left hand smashed with a bottle. A figure appeared on the top of the hardware shop—it looked like the guy from the sidewalk—and took a long windup before throwing something into the street.

There was a tinkling of glass and a red circle of flame slid across the pavement where it hit just in front of the car, sending smoke curling up over the hood and obscuring the inside. Murphy was going to have to play it by feel now; you couldn't see a thing in the car.

A teenager with a stubby rifle stepped out of a doorway, crouched down low like in a western. He fired twice, very accurately and very fast, at the window of the car. A patrolman was halfway out the door when it hit him full in the face, sprawling the body back over the roof and then pitching it forward into the street.

A red blotch formed around his head, grew rapidly and ran into the gutter. There was ragged cheering and the teenager ran over to the body, tore off its badge and backed away. "Souvenir!" he called out, and a few of the others laughed.

I looked at Murphy again and he  
*turn to page 94*



Dear Cousin Boris,

It was nice to hear from you again and to learn that you are still strong and stalking after all these years.

I have just finished shaving and I must tell you that it is the same as always. Although the American inventive genius has come up with some real miracles in this line that make our straight edge razors of a couple of hundred years back look like something out of the stone age, I still manage to cut myself and sometimes badly. And you know what a tragedy it is to a vampire to bleed!

But I have never mastered the technique of shaving with no image to look at. I do not know why our code doesn't allow us to wear beards. It makes it especially difficult in America these days, because the country has gone wild over hair. Anyone without it is suspect and the last thing we want to be is suspect.

You write that things are not going well in Transylvania and you are thinking of coming to America.

While I agree with you that there is much more freedom here, I feel I must also warn you of the disadvantages.

For one thing, when you come, if you do, I have very poor accommodations for you—a packing crate would have to do. I used to have a spare coffin for guests, but some thieves broke in here one night while I was out and stole it. It was a damn expensive mahogany one that I brought with me from France in 1820.

I was furious over the loss, of course, but there was nothing I could do. I certainly couldn't report it to the police!

This is one of the major problems in America. Crime in the streets is completely out of control. Not only do you have to double padlock your house, anyone who goes out after dark takes his life in his hands. And, of course, that's when all the action is for vampires.

It is next to impossible to lurk inconspicuously near the entrance of a large apartment building anymore. There are prostitutes, muggers and drug addicts all idling about waiting for someone to leave the building, and there are only so many trees, trash cans, etc., to hide behind.

I know what you are thinking. Why don't I just take one of them for my victims and be done with it.

Would that it were so simple!

I used to do that. Then one night I got the blood of a drug addict. I became addicted myself. It got so I didn't know which I needed most—heroin or blood. I went through about six months of hell with these two monkeys on my back before I finally decided to go cold turkey in my coffin and shook the heroin addiction. I never want to go through that again! When I was under the spell of that stuff I did things I'm ashamed to admit to—I became a common thief. You wouldn't have known me.

So that's why I now ignore the muggers, prostitutes, etc. Straights are my only victims. Of course, they're more difficult to get. When one appears in a doorway sometimes there's such a stampede to get at him that it panics him and he jumps back inside and slams the door shut.

Also, with all this crime, people are turning their homes into fortresses, making it more and more difficult to break in.

America is still the land of opportunity, but it's not as free and wide open as it once was.

However, your suggestion that if you do come we could get together with other vampires across the country and form a League for the Protection of Vampires definitely has merit.

America is very big on minority rights these days. We might even be able to interest the American Civil Liberties

Union in our cause.

I'll do almost anything to stop this recent flood of vampire movies. I'm telling you the violence in them is just sickening.

I saw one the other night on TV and it showed this vampire calmly going about his business until this snoopy reporter got on his tail and brought out all that old mumbo-jumbo about crosses and wooden stakes and ended up driving a stake through the poor devil's heart. Right on national television! Can you imagine? Such violence! Sometimes I think the psychiatrists are right when they say that America is a sick society.

Movies like that make vampires fair game for any nut with a mallet and wooden stake, and you now how easy those are to get these days.

At least in Transylvania the citizens allow the authorities to handle the vampire problem and you don't have to worry when you grab a person on the street that he's going to turn on you with a cross and then pinion your chest to the nearest tree. I tell you it's scary as hell. I think I'm getting an ulcer.

Well, it's about midnight now and time I went to work, so I'd best close.

I think I'm going to move out of here. Like I said, it's getting dangerous to go out at night. In addition to all the muggers, prostitutes, addicts, lunatics with mallets, etc., I was chased home last night by a damn werewolf. The whole neighborhood is going to hell.

Send your next letter to me in care of General Delivery, Fairbanks, Alaska. There aren't many people in Alaska, so the percentage of muggers, etc., should be way down. And, in addition, I understand that in some parts of Alaska the nights are six months long.

A vampire could get a lot of work done in a night six months long.

Affectionately yours,  
Your Cousin Joe ○

---

The Good Old Days are gone forever, and that's a sad story  
for a lot of people—and others!

# Vampire's Lament

fiction/Don Kerr







## MISSION FOR A VETERAN

from page 20

***Each year he performed his duty without letting that duty dim his dreams of the past that never was—until his past caught up with him and his duty became clear.***



fleet, at a tactical advantage, would keep the other fleet from the first. As a war, it was mostly a balancing. It was a constant balance of threat.

The threat was total annihilation of worlds. The destructive weaponry on both sides would allow, could allow, nothing less. Only one of the Fleets could destroy the other and, thus far, no such opportunity had arisen.

But, near Aldebaran, it had looked as if such a confrontation was an imminent possibility. It appeared that, finally, the alien enemy would allow a chance for a clear cut and decisive battle. The entire Federation Fleet engaged what was believed to be a major portion of the enemy vessels on a search and destroy mission.

But the alien ships were a decoy. In the middle of the engagement the Federation Fleet received the distress call from Altane, whose planetary warning system had detected alien vessels intruding on her space.

The High Command of the Fleet de-

cidated not to break off the engagement which looked, not only as if it was already won—as it did, but also as if it might develop into a major and conclusive battle.

It wasn't until the Federation Fleet was firmly committed that the alien vessels began to fight in earnest. They began to fight what was, to them, a holding action.

So, by the time that the Fleet recognized that they had been duped and was able to withdraw, the planet of Altane had already been destroyed.

And, so had Mirane.

Mirane.

He pictured her in the moodgarden behind her home. It had been, perhaps, the loveliest moodgarden of all of the thousand worlds.

He recalled the day of his final leave-taking, the first day that he had worn the faded blues of a junior Fleet officer.

She had been lying on the contoured chaise, in the grove of unending wind. About her the trees gently swayed as

their leaves hummed in the wind, the branches seemed to move of their own volition.

"You're truly leaving?" she had said, as if in all the months of his training she had thought that he had only been playing a long and rather dull game.

"Yes. I must." He had gone to her and kneeled down by her side, the moist soil of the garden wetting and staining his new uniform. More than anything, he had wished for her understanding.

The mechanical birds of the moodgarden sang a sad song, a melody of confusion, made of remorseful notes. In the past, the computers that controlled them, had only called for lilting tunes.

"Then, go." She had not looked directly at him but neither had she taken her hand from his.

"Someone must do this," he had said. "If not me, then someone else would have to."

"But you want to," she said, "that's what I can't comprehend."



"There's a war." He had tried to answer her but then, even as now, he had not been able to answer even himself to his own satisfaction. "We may not see, nor hear of it, every day, and it may hardly affect us. But I feel that I must find it, that I have to see it for myself."

"The war." She had laughed and the fan-blown winds had sighed in a gentle counterpoint. "There is no war. You seek a lie. You've pledged yourself to a myth."

"Yet planets have died from this myth," he had replied with, perhaps, more heat than he had intended to. "Entire planets have been destroyed. Whole populations, killed outright."

"Twenty years ago," she had said, "was the last time that happened."

"To Gemma II," he had said, and to him the name evoked a sadness.

"And fifty years before that," she had gone on, "and I don't even recall that world's name."

"This isn't helping," Yost had said, "and I know you don't mean what you're saying."

"No, I don't. But, you're needed, Ainson." She had turned to him then and he had seen the tiny tears forming in the corners of her eyes. "You're needed here. I need you."

The garden moved toward dusk. The light dimmed to sepulchrous twilight. The wind too had died down.

"Mirane," he had told her, "I know that, but I can't stay. Can we afford to take the risk of another planet, of close to a billion people, being destroyed? I can't. I just can't."

"I love you," Mirane said. Then she had stood and removed her hand from his. "But as you've decided to leave, I realize I've lost you. While you wear that uniform I find that I can't speak with you." She had kissed him and silently stood. Without ever speaking to him again she had turned and walked the short pathway back from the moodgarden to her home.

She left, and the moodgarden now bereft of its mistress allowed night to fall.

For a time he sat alone in the darkness. There was no wind. There was no light, there was no song.

Mirane.

"Captain? Captain Yost?" Kevin it was who shook Yost's arm. Yost blinked. "They're waiting for you, Sir."

"Sorry, Kevin." He rose from his seat and walked to the lectern. His shoulders were held stiffly back, as his military bearing—the habit of a lifetime—returned to him.

He had already been given a long introduction, though he supposed very few in the crowd had not heard of him long before. He was, after all, the only veteran on Jacob's World. Discharged from the Fleet twenty years after his own world of Altane had been destroyed he had chosen the then-new colony as his home.

The crowd was silent, waiting with anticipation.

Each year, he thought, all of this seemed to take on more and more of the trappings of ceremony, of some cultist rite. Ainson Yost found himself strongly disapproving of this. It should never, he thought, have been allowed. It just makes the war seem even less real.

He unclipped the transceiver from his belt and raised it to speak into its microphone.

"Calling nearest Fleet cruiser," he said, both into interstellar space and the expectation of the crowd. "This is Captain Ainson Yost, Galactic Fleet, Retired."

He repeated the formula a few times. As he did so he recalled the one time he had ever used the transceiver for an unauthorized call.

It had been two years ago, when he had still thought he might have something left to offer the Fleet. He had called to ask to be taken off of the inactive roll and given a job behind the lines.

He remembered. He recalled it as if it had been but two hours, not years, ago.

His request had immediately been shunted to the office of the Commanding Admiral. That was how rare it was for a retired officer to seek reassignment.

He had been pleased, though quite surprised, when Commander Kane had spoken to him personally.

"Ainson?" The reply coming from the transceiver's small speaker was made weak and tinny sounding by the vast distances and many relays involved.

"Ainson? This is Commander Kane speaking. Are you receiving?"

"Yes, Commander. I am calling to request transfer back to active duty, if the Commander pleases."

"The Commander doesn't please, Captain Yost. Do you realize the costs involved in this call of yours?" Even the poor fidelity of the transmission failed to hide the note of irritation within the Commander's tones.

"Sir," Yost ventured, "I thought that perhaps my services might still be needed."

"Still be needed?" the reply came. "If they install a few more machines around

here, they won't even need me, Ainson!"

"Sir," Yost had said and, even as he recalled he could still now feel the tingling of doubt, "is it due to my arm?"

"No. Of course not!" Kane had snapped back. "I think that civilian life may have softened your brain after all. We need you right where you are, Yost. Right there, on Jacob's World."

"Here?" Yost had been confused. He was still confused over the Commander's meaning. "Why here, Sir?"

"Let's just say that you have a mission, Captain and that I expect you to fulfill it."

"But if I don't know what this mission is, Sir, then how?"

"Captain Yost. Ainson. This call has already cost the Federation's taxpayers too much. I suggest that, in the future you use that transceiver only for official reports. Break contact."

"Breaking contact, Sir."

He had turned to Kevin who had been with him that day. "Well, it was worth a try, son." He had said, making light of his own deep disappointment. "It was sure worth the try."

The boy's eyes were fixed on the transceiver.

"You know, Captain," he had said, "I've seen you use that on Pension Day, but to have actually heard Commander Kane. . . . Where do you think he was?"

"I don't know for sure, Kevin. Last I heard, his flagship was the *Aquilae* in Battle Sector Four, out around the Belatrix area."

"I'm sorry, Captain," Kevin had said as he suddenly realized what exactly he had heard. "But I am glad that you'll be staying on. We'd all miss you if you left us. After all, you're the only veteran we have. And don't worry. You'll figure out what it is Commander Kane wants you to do and, when you do . . . well, then you'll do it."

"Yes, that I will, Kevin. When I figure out what it is he wants, this mission of his."

"Captain, they're waiting for you." This time it was Mayor Javes himself who jostled Yost's arm. Ainson wondered just how long he had been lost in his own thoughts, standing before the crowd and dully holding the transceiver. Well maybe, Yost thought to himself, they'll think I was adjusting something.

"Captain Ainson Yost," he once more repeated into the small transceiver, "calling nearest starcruiser to Jacob's World."

"Captain Yost," came the reply which was immediately amplified for the ears of the crowd, "this is Federation Cruiser



**Even had the ship  
left its assigned  
position it couldn't  
have gotten to  
Altane in time  
to save either the  
planet or the one  
girl he would  
always love.**

*Aquilae*. Go ahead with your transmission, we read you five over nine."

"Captain Ainson Yost, retired, now stationed inactive on Jacob's World, Supply Sector Two, reporting to Federation vessel *Aquilae*," Yost said into the microphone. "Status report is unchanged. There are no reports of hostile alien action, nor have alien vessels been sighted in the past standard year." Ainson allowed himself to wonder whether or not Kane was still stationed aboard the *Aquilae*. But what did it matter? No matter where Kane might be, at least he was still being of service.

"Your report has been received," the *Aquilae* responded, "and logged. Thank you, Captain. Breaking contact."

"Break contact," Yost repeated. Suddenly he was startled by a loud, and unplanned, shout from the audience.

**I**s this why he gets five thousand creds a year?" The outraged shout came from an unknown man near to the front of the audience. "Why in Hell are our taxes spent on this?"

The majority of the crowd was silent, almost as if in grudging agreement. It was, by no means, a new sentiment that had been just then shouted. No, the man had only said what the orators of the Square had been saying for the past two years—though the man had been more to the point.

It hurts, Yost thought bitterly, that in all this crowd no one will raise their voice to defend Pension Day. So the war was far away and it dragged so slowly. Whose fault was that, he asked himself. Besides, shouldn't they be grateful for that fact?

He murmured his excuses and turned back to his seat. This year, he decided, the Mayor can deal with the rest of the formalities.

With half his mind he listened to the Mayor's speech as the venerable man tried to reawaken a festival spirit which had never really been there to begin with. But soon, Yost found he couldn't even give the Mayor his divided attention as his thoughts began to fade back. Back to before Altane, to just before death.

There were five of them on the ship, four others besides himself. All of them had come from various worlds and had various cultural ties.

Engineer Jenks, for instance, had been born and raised on Hydra. Until he enlisted he had never once seen sunlight. To Jenks, in charge of the computers which ran the warship's FTL engines,





the stars were sources of constant mystery. Of all of them, Jenks was the most appreciative of space and, on that voyage, a close friendship had developed between him and young Ensign Yost.

It was the middle of the Aldebaran battle, the one that had been a decoy, that Ainson's memories returned him to. At that time it still looked as if the battle might have become a decisive fight. To the High Command, it had appeared well worth the fight.

The distress call from Altane had been received a half-day ago and already the word had travelled throughout the Fleet that the High Command had decided to wait on answering the call and to remain engaged in action. It was a chance they decided to take, a brave gamble, based on the hope that to battle might mean a final victory. As it turned out, they were wrong. The High Command had been terribly mistaken, but they had never really had a choice. Hindsight seldom works in advance.

Yost's Captain was a man named Kane, who already had then seemed destined for swift and high promotions. He was a harsh man, but had an amazing innate grasp of strategy and tactics.

Yost recalled that Kane's homeworld had been Gemma II. At that time, Gemma II had been the last planet to have suffered total destruction in the war which even then had seemed unending.

Both Kane and Jenks entered Yost's duty post. The ship was quiet, inactive. It was stationed as a reserve unit and was not engaged in any fighting or maneuvering to hold the attentions of either her crew or Captain.

Though Yost was unsurprised to see Jenks he knew that, even with the ship inactive, the Captain must have better things to do than to call socially on an Ensign.

"The distress call the Fleet's received comes from a planet by the name of Altane," Captain Kane said, "Ever hear of it?"

"Yes, Sir," Yost replied, "it's my home."

"I know, Ensign. The name sounded familiar so I checked the ship's roll."

"Yes, Sir," Ensign Yost waited, not feeling it to be yet his place to speak.

"You know, Ensign," Kane replied, "Gemma II was my own homeworld."

"I know that, Sir." Gemma II was, for the past ten years even as Kane spoke, no one's home any longer. It was lifeless. Murdered. Destroyed.

"What do you think, Ensign, of the High Command's decision to continue the engagement in this sector?"

"I would imagine," Yost had replied, "that the High Command had reasons for their order."

"Do they?" Kane replied. "I wonder. Don't you think it would be a good idea to send aid immediately to Altane? Even ten ships might make some difference."

"Altane is my home, Sir." Yost had said, "Of course I would want to see it safe."

"It's a funny thing," Jenks said, breaking his silence. His voice was filled with compassion for his friend, "but Aldebaran does throw out some peculiar radiations. Interfere with FTL communications and all. You know, it's even possible that we might have received jumbled orders from the High Command. As a matter of fact, we could even have been so scrambled that we might think we have orders to go to the aid of Altane."

"Would one ship make the difference, Captain?" Yost asked although he already knew the answer.

"No," Kane replied. "Frankly, it wouldn't have a chance of doing good. If Altane is actually under attack, no chance at all."

Mirane.

She had offered light, he had taken the night.

"For the longest time," Kane said, "I've wondered what would have happened had my own ship received jumbled orders around the time of Gemma II."

"How about it, Ainson," Jenks asked. "If we *have* received our orders wrong, we had better start acting on them."

"I appreciate this," Yost recalled himself as saying, "but you know there's only one choice I can make."

"I know, Ainson." Kane had said, "If I suspected that you might have done the wrong thing, I never would have asked you. This is the only thing we can do, to continue to obey our orders. I thought you deserved a chance to figure it out for yourself."

Kane and Jenks left and the ship remained in the Aldebaran Battle. When the High Command finally realized the decoy situation and steered the Fleet toward Altane, two whole weeks had gone by since the original distress call. Even at that, the Fleet was but three days late.

But that was so late they might never have bothered to go.

Mirane.

Yost called to her ghost as she danced in the midst of the flames, as she sang in her garden of fire.

"Calm down!" Mayor Javes shouted,

"Come on, now. This isn't going to do any good."

The crowd was noisy, shouting, restless. Yost found that he had lost track not only of the Mayor's speech but also of the reaction to it. Many people in the audience were raising their voices and it began to appear that the crowd of friendly people could, at any moment, become a mob.

"No more taxes," a voice shouted, "for a war that's never fought."

"No more funds," another shout, a woman's, "to go to warriors who never fight."

Ainson spotted the fact that a group of approximately two hundred had worked their way to directly beneath the podium. These, he saw, were the ones who were shouting, the ones whose screamed slogans and curses had brought him back from the journey of his memory.

Suddenly, Mayor Javes pitched violently backwards. His round face was marred by a streak of blood which ran its way from the center of his forehead to his jowl. He had been hit by a thrown rock, hit hard.

Kevin ran to his father's aid and half carried, half supported, him back to his seat.

The Colony Police moved through the crowd from where they had been stationed near the back. But the confused milling of the crowd barred their advance.

Yost rose, moved to the lectern. "Keep back," he whispered to Kevin.

"What is all this?" he demanded of the crowd, his voice once more rang with the tones of command. He was old but he had not forgotten how to give orders, or how to control any quavering from entering his bass tones.

"Go home, now. If you've a complaint on anything you can take it to the Sector Governor." If I can delay, he thought, only long enough for the Police to reach the front . . . it was foolish to have held the ceremonies this year . . . too much dissension in the air . . . war's too far off . . . you can't expect them to understand.

A man directly below the podium screamed an obscenity. Another stone whistled through the air by Yost's own head.

Mirane, Yost thought, it can't end like this.

Suddenly, Ainson found himself grabbed from behind by one of five men who had run onto the podium, shouting the inane slogans of their group.

Without conscious thought, that being



the way his reflexes were trained, Yost lashed out in a form of personal combat he had been taught many years ago. But he was out of practice and misjudged his blow. There was a sickening, snapping noise as the man who had grabbed him fell to the floor of the lectern. The man's neck was at an odd, but all too familiar angle.

The remaining four men backed off. The crowd became silent. For just a moment it looked as if sanity might yet return.

But then one of the four yelled out to his companions, "He's a cripple. He's only got one arm. He can't take all of us."

The four moved in. It was obvious from their awkward actions that none of them were trained fighters, and neither had they ever trained to fight together as a group.

Yet, Ainson thought, the man's right. I am a cripple, and I can't take all of them. I'm just too damned old.

"Then try it," Yost shouted, but they were already on him.

He felt his own blows connect and shortly there were three attackers still mobile. But two of them managed to pin Yost's one arm behind his back. The Police, Yost thought, they should be up here by now.

He closed his eyes. He was calm. All there was left to do was wait.

One of the men who was holding him shouted something and Ainson suddenly realized his arm was no longer being held. He backed off and quickly wheeled about into a crouched defensive stance. He saw Kevin fighting the two remaining men. He moved in and, with a quick chopping motion, brought the odds to favor Kevin and himself. The last man looked wildly about, jumped from the side of the podium and ran back into the crowd. But the Police, who had finally forced their way to the front, stopped him.

Ainson's heart was desperately pounding and he could hear the whistle of his own blood singing through his ears. He walked to Kevin's side and shook the young man's hand. He was surprised at how proud he felt of the boy.

"That's the way, Kevin," he said. "They couldn't have taught you better at the Fleet Academy."

Kevin replied something, but he could not quite make out what the boy said. He could see Kevin's lips move and he stood less than a foot away. But his ears just would not obey him. He felt so light. He felt good. He had not felt this way

since before Altane.

The Police, who had arrived on the podium itself, made their way to Kevin's father. The scene seemed divorced to him, as if he was witnessing a film. Try as he would, he could not find the reality of it all. It was Pension Day. He'd made his report. What was the fuss?

His eyes wouldn't focus properly. In a blur he saw Kevin spring to his side and felt the young man's arm behind him. But, as to what was happening to him, he really couldn't guess.

Actually, Yost thought, I've decided the orders were jumbled after all. Jenks set a course for Altane. You can't miss it. Its sun is the brightest star around. It's bright, it's very bright. Come on, Jenks, Captain Kane. I'll introduce you to Mirane.

It was so dark in the garden now that night had been programmed to fall. It wouldn't be so bad if he wasn't all alone. Why? What had he said? What had he chosen? For the life of him, he could not recall.

Where was the wind? Where were the flames?

Altane. Aldebaran. Kane. Pension Day. Gemma II. Mirane. Kevin. Mirane. Mirane. The night of the garden enveloped his dreams.

**H**e awoke in a white painted room and tried to sit up. But the pain in his chest was too great. The strain, it occurred to him, must have hastened the sickness of age. At least, he thought, I can be clinical. It's not too bad, though. If I had two arms, I could probably sit up.

"Captain?" The voice was Kevin's. Though his sight was terribly blurred, Yost could make out the boy's form sitting at the foot of the bed.

"Yes, Kevin. I'm all right, son. It's a brave thing you did, helping me out that way. I'm beholding to you. How's your dad?"

"He's fine, Captain. He'll be in to see you shortly. He tells me you'll be out soon, yourself."

"Thanks, Kevin." Yost formed his words carefully to penetrate the wall of pain that surrounded him, "But you know I've never been one for an easy lie."

Kevin was silent. Yost appreciated that the boy wouldn't try to make them both carry on some sort of hopeless charade.

"Captain," Kevin finally said, "there's something that I've got to say. I've been meaning to say something for some time, now. I'd like to . . . Well, I'd like to

enlist. That is, if you think the Fleet will have me."

For a moment Yost again was lost in his own thoughts. They were disconnected, they were fragmented. But they made a kind of sense as they firmly outlined his life.

"You're needed, Ainson," he heard Mirane say, "You're needed here, by me."

Then, almost simultaneously, he heard Kane's voice: "If I thought you would have done the wrong thing," he heard, "I never would have asked. But you deserved a chance to figure it out for yourself."

He recalled again how Altane had looked when he first saw it as its own tombstone, spinning dead in space. But the fields of Jacob's World were green and there was life all around, outside the confines of the room.

It all tends to make sense after a while, Ainson told himself, and, even if it doesn't, it's still all I have. And that's been more than enough.

Once more he heard Kane's voice; an older Kane, perhaps a wiser one.

"Let's just say that you have a mission, Yost," came the memory of the Commander's voice, "and I expect that you'll fulfill it." Then, in counterpoint, he heard a younger Kevin's reply, "You'll figure what Commander Kane wants you to do. When you do, well, you'll do it."

"Captain," Kevin said, Kevin at the edge of the bed, "did you hear me? I said that I'm hoping to enlist."

"Did they bring the transceiver along?" Yost asked.

"Yes, Sir. It's here. By your bed."

The boy placed the slim rectangle of the transceiver into his hand. Ainson could no longer see, but he could feel the cold slimness of it. A mission? Yost asked himself. I guess that, in a way, it was.

He thumbed the transceiver on and made his call. It was the ship, *Aquilae*, which answered.

It took most of the old warrior's strength to keep his mind on what was at hand. But, he did. For he had yet one more duty to fulfill. A final responsibility, and a good one.

"Is Commander Kane still stationed aboard?" Yost asked. The reply was that Kane still was.

"Then tell him to get onto the line," Yost said. "Tell him that Captain Ainson Yost is reporting 'Mission Accomplished.'"

"Yes, Sir," the *Aquilae* responded, "please stand by."



***He knew it was going to be a close thing, that he had only minutes more to live. But he also knew that, while he still lived, his mission would be completed, and he could die in peace.***

Yost handed the transceiver to Kevin. The effort caused him to gasp and Kevin came to his side.

"No," Yost said with whatever strength he was still able to gather, "stay on the transceiver. After all, these calls cost money, you know."

He heard Kane come on but he could only dimly make out the words. By straining his will more than he would have believed was possible he was able to hear Kevin say, "Yes, Commander. I'm ready to report. Yes, Sir. I'll tell the Captain 'Well done' for you."

Mirane.

With his eyes still closed he could see her in the moodgarden. The flames no longer burned, night too had now turned to day. It was cool and it was peaceful there.

He wondered if he should go to her. He wondered what she would say.

Will she forgive me? he thought, Will she know how it was?

She looked up. She seemed to see him. Around her, encompassing them both, the moodgarden began to sing.

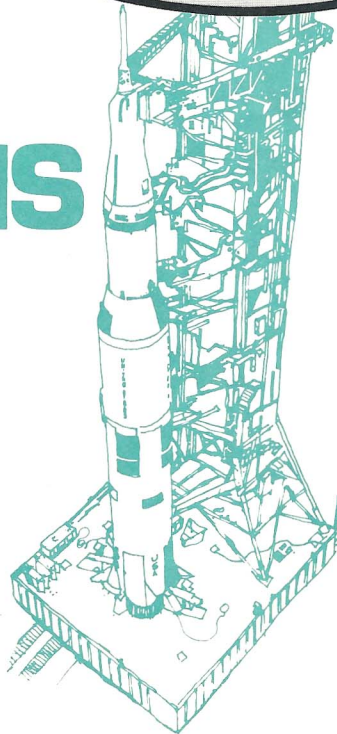
He walked towards her and, even as night began to fall, he knew he went towards a sure and certain love. ○







# DESIGNS FOR OUTER SPACE



As soon as America made its commitment to manned space exploration and the first crews were picked the various astronauts got busy picking names for their spacecraft and designing mission patches, from humorous to serious, from artistic to cartoon, depending on individual outlook and lifestyle.

Each of the patches tells a little something about the crew that flew that mission, and, of course, about the mission itself. From the proud statement of the Apollo 7 patch, the first Apollo mission patch, which seems to say "We're gonna fly this mother," to the serious symbology of the Apollo 11 patch, showing pride in this American accomplishment through the use of the U.S. eagle without actually showing a flag, to the Apollo 17 patch which literally yells "We aren't stopping here," they all have something to say, and they all say it with pride.

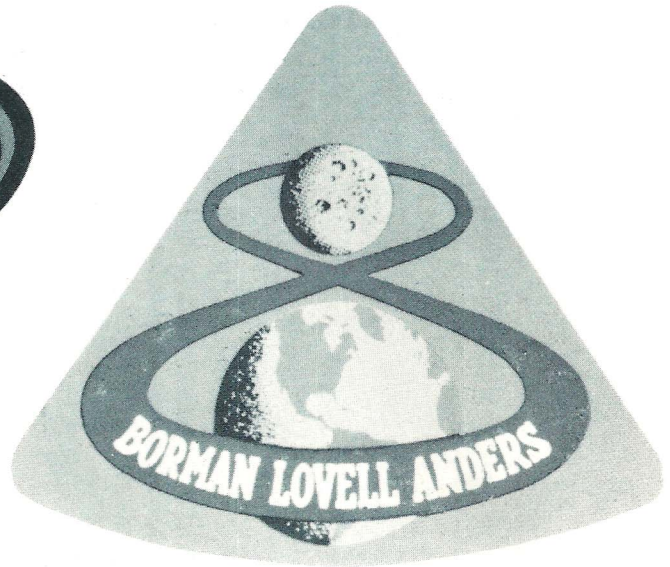


*Apollo was the culmination of ten years of work,  
and the patches they wore showed the dedication  
these men had in their mission to the moon.*



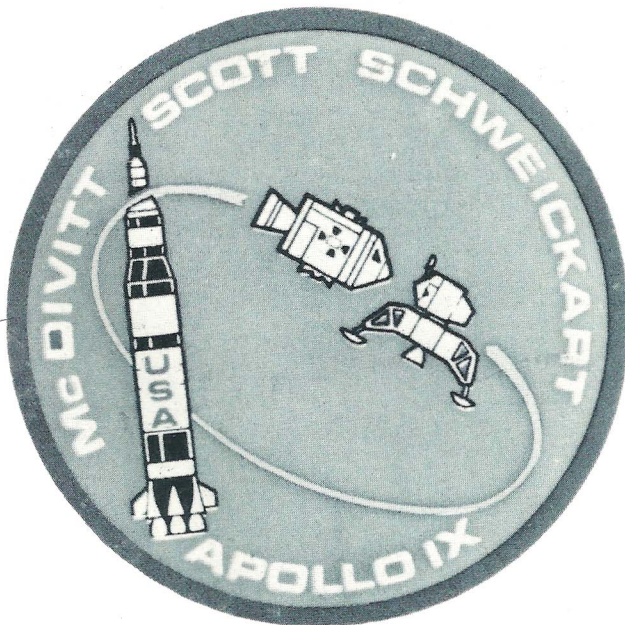
**APOLLO 7:** Shows the command and service modules passing over the Western Hemisphere in Earth orbit. The spacecraft on the first of the manned Apollo flights performed perfectly through more than 78 hours in orbit. During tests the engine was fired eight times, and the mission featured the first live TV from a manned vehicle.

Crew: Walter Schirra, Donn Eisele and Walt Cunningham.



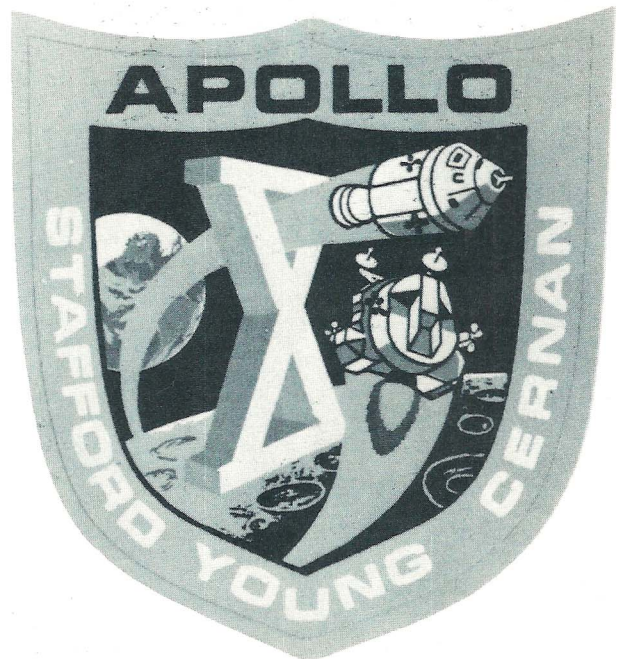
**APOLLO 8:** Shows in the patch the major accomplishment of the mission, the figure eight flight from Earth to the Moon and back. This mission marked the first trip by men to another body in the solar system, and the first attempt by men to leave the vicinity of Earth. In the 147 hours of flight the crew covered 500,000 miles and flew ten lunar orbits.

Crew: Frank Borman, James Lovell and William Anders.



**APOLLO 9:** Shows that this mission was the first manned test of the complete Saturn V-Apollo assembly, including the first actual flight of the lunar module (in Earth orbit) and the first exit from the Apollo command module while in flight. During the tests the crew also performed the first systematic Earth resources survey.

Crew: James McDivitt, David Scott and Russell Schweickart.



**APOLLO 10:** The patch shows the lunar module swinging low over the lunar surface while the command and service module watches from Moon orbit. It was the final test of the Moon mission vehicle, and during the test the lunar module dropped to a mere nine miles above the Moon, bringing back the most spectacular photos ever taken of the Moon.

Crew: Tom Stafford, John Young and Eugene Cernan.



*Apollo was the dream of a nation, and with the founding of Tranquility Base, the landing of the Eagle, that dream became reality.*



**APOLLO 11:** The Eagle, carrying the olive branch of peace, founded Tranquility Base, man's first outpost on another world, at 4:18 PM Eastern Daylight Time on July 20, 1969, and some six hours later what has been estimated as the largest TV audience in history watched Astronaut Neil Armstrong become the first man to walk on the Moon.  
Crew: Neil Armstrong, Edwin Aldrin Jr. and Michael Collins.



**APOLLO 12:** The Yankee Clipper signals the all-Navy crew which went to the Moon aboard Apollo 12, bringing their lunar lander the Intrepid to rest on the Ocean of Storms, where the crew began NASA's extensive survey of the Moon, emplanting a complete nuclear-powered geophysical station and making two long-distance field trips.  
Crew: Charles Conrad, Richard Gordon and Alan Bean.



**APOLLO 13:** The three horses of the sun god Apollo were to take Apollo 13 on a scientific mission to the Moon, but some 200,000 miles out an oxygen tank exploded, and the world held its breath for the next few days while the crew circled the Moon using their lunar lander as a lifeboat and finally returned safely to Earth in their revitalized command module.  
Crew: James Lovell, Jack Swigert and Fred Haise.



**APOLLO 14:** Apollo 14 marked the first landing in the lunar highlands, at Fra Mauro, and the return of America's first astronaut to active duty, as Alan B. Shepard, our first man in space and one of the original Mercury Seven, commanded the mission which set up another geophysical testing station and searched for older "core" rocks.  
Crew: Alan Shepard, Stuart Roosa and Edgar Mitchell.



*Apollo took man to the moon, and future programs will take him farther. But Apollo was the first voyage to another world, and so history will say.*



**APOLLO 15:** The patch uses three symbols to stand for the three crewmembers who went to the Moon, in orbit around the Moon. The large disc in the center has the red, white and blue symbols of the flight centered on a drawing of the Hadley-Apennine landing site, where they were able to make extensive use of their new Lunar Rover.  
Crew: David Scott, Alfred Worden and James Irwin.

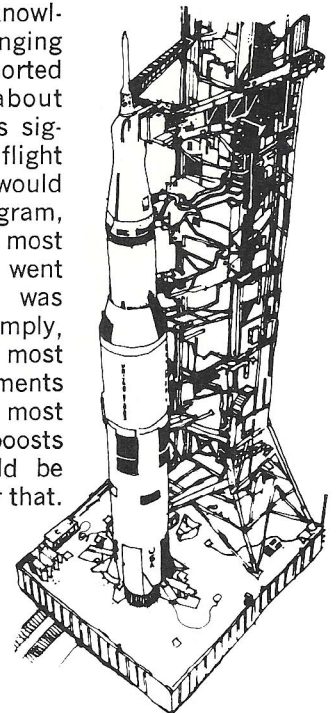


**APOLLO 16:** The wishbone shape over the patch is the shape of a theoretically perfect wing. The Apollo 16 crew landed on the southeast part of the Moon, at Descarte, and during their three day stay they drove their Lunar Rover some 15 miles, picking up and returning to Earth some 245 pounds of rock and soil samples for scientists to study.  
Crew: John Young, Charles Duke and Thomas Mattingly.



**APOLLO 17:** Apollo 17 was the last in this series of Moon exploration missions, and the emblem is dominated by Apollo, the sun god. Behind Apollo is the American Eagle, the red bars of the U.S. flag, three stars for three astronauts, and on the dark blue background the Moon, Saturn, and the ultimate field of exploration, our Galaxy.  
Crew: Eugene Cernan, Ronald Evans and Harrison Schmitt.

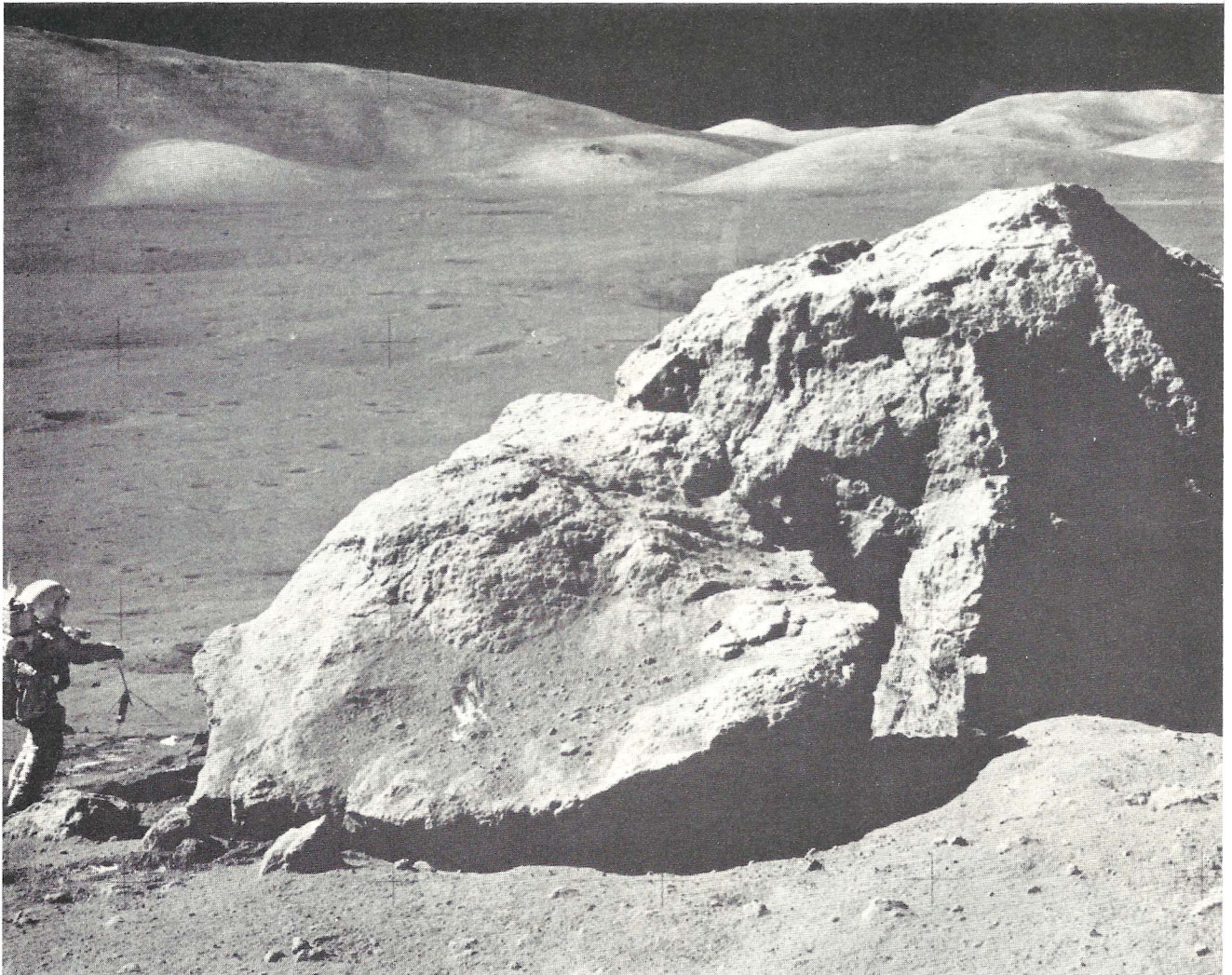
Neil Armstrong talked about a giant leap for mankind, Harrison Schmitt talked about the knowledge the astronauts were bringing back from the moon, assorted other astronauts talked about everything from the religious significance of space to how our flight to clean up our environment would be helped by the space program, but what was probably the most significant statement of all went practically unnoticed. That was when one astronaut said, simply, "Ain't it fun!" From the most solidly pragmatic accomplishments of the space program to the most psychologically important boosts it has given man, all would be worthless to us if it wasn't for that. It was something worth doing, if only because it was something man has to do. ○





# SELENOGRAPHY

from page 49



of the maria, those right at the 200-mile-diameter mark. In fact, most selenographers term anything of this structure over 200 miles in diameter a mare, while anything under is a ring mountain, though there are some other differences. As said earlier, in most cases the floor of the depression is lower than the ground outside the ring, but this is not always the case. In some cases the ring structure is on top of a mountain far above the surrounding plain, and in some cases the floor of the ring is itself higher than the surrounding plain. The best known of these is Wargentia, which is almost a plateau in itself, with an interior floor some 1,500 feet above the outside plain and the mountain ring now only a low circular mount, broken in many spots.

The term crater is actually synonymous with ring mountain, but in general usage it can be said that any-

thing over 20 miles in diameter is a ring mountain, and anything under a crater. Anything under 2 miles in diameter is usually called a craterlet, and the smallest craterlets, so long as they have an upstanding ring, are called crater pits.

A typical crater still in good shape is a saucer shaped depression, just like a ring mountain, with the floor level of the crater below the level of the surrounding country. The outside slope generally will not be steeper than 10 degrees. In some cases the ring wall will be terraced, with multiple ridges. Copernicus is a good example of this type of crater. As the diameter of the crater being examined becomes smaller, the structure of the ring wall generally becomes simpler. However, terraces such as those at Copernicus are well developed on the 28 mile diameter Herschel Crater, and Ball Crater, 25 miles in diameter, has

sharply terraced inner slopes which descend some 5,000 feet from the ring wall to the crater floor about the central peak.

Small and medium size craters often form crater chains. This sort of chain is especially evident between Copernicus and Eratosthenes. Often crater chains will blend together into a continuous cleft, and in some cases the crater chain will end with the beginning of a wrinkle ridge.

Fracture lines in the crust are quite common on the moon, when looked at in an overall view, despite the fact that none of our astronauts accidentally fell into a lunar crevasse. The younger fracture lines are exposed to view, but the older features are only recognizable by their influence on the shape of ringwalls and other lunar formations. The most obvious of these fracture lines is the Straight Wall in Mare Nubium. It is a fault line, rather than



## Apollo 14's Edgar Mitchell set up an Apollo Lunar Surface Experiments Package to send back information.

a cravasse, with a height of some 800 feet and just over 60 miles in length. There is a similar fault line in the Sea of Tranquility, where Apollo 11 landed, and it is paralleled farther north by a system of fault and fracture lines which extend from Taruntius through da Vinci to Vitruvius.

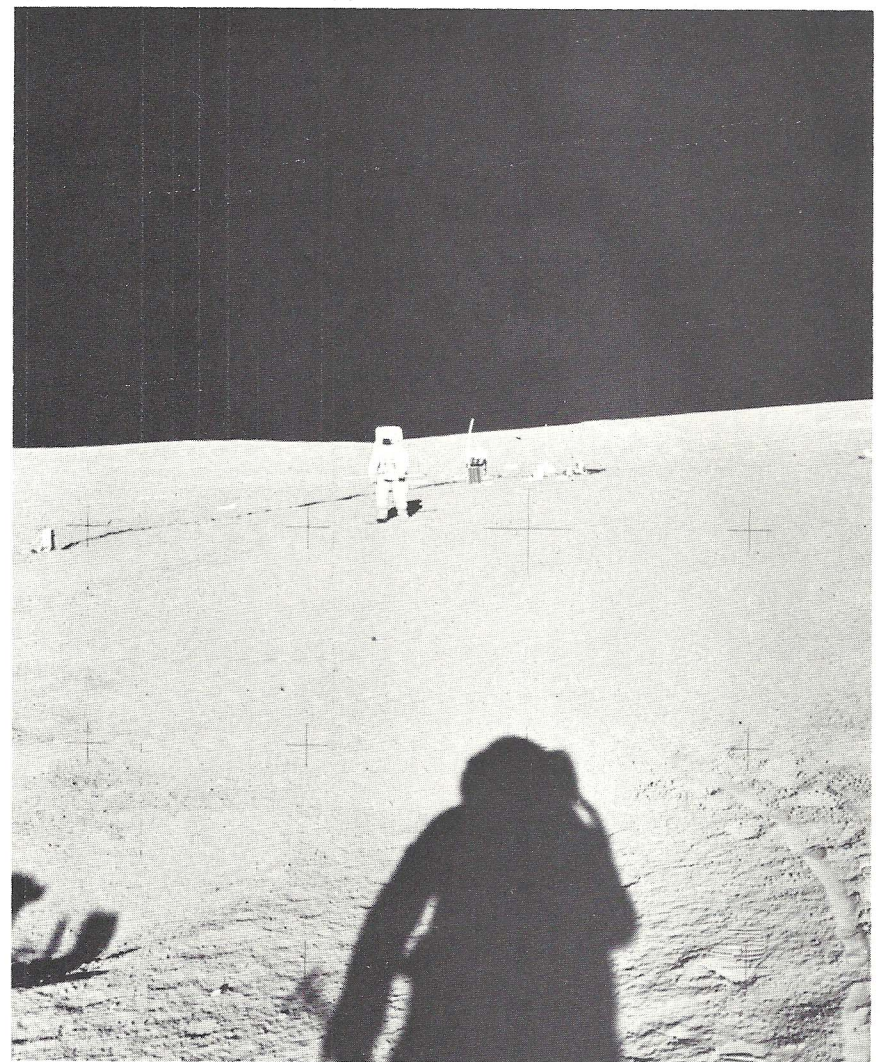
If a fracture line has spread, whether or not one side has risen to form a fault line, a rill is produced. Close to the Straight Wall there is the Birt Cleft, which is a rill and is also a continuous crater chain. Indeed, many rills have the tell-tale scoops in their sides which indicate they were originally crater chains. Most rills run fairly straight, but there are some, such as Schroter's Valley and the ravines in the Apennines, which twist and turn about, and, in fact, look exactly like mountain stream beds.

Apart from the rills, the highlands are crossed by a system of tear valleys, which also seem to be associated with crater chains. There is a major system of tear valleys in the area of Ptolemy which passes through and beyond the South Pole, and a smaller system near the North Pole.

**T**he features we have discussed so far have been divided by being either of highland or lowland material. There is, however, a third type of surface on the moon. A type of surface which appears to be entirely superficial. These features are the famous "rays," and while these features are hard to see when the sun is low in the lunar sky, they are highly prominent when the sun is high. The photo of the moon which leads off this article shows a face streaked, blotched and spotted with both dark and bright markings which bear little relation to the configuration of the underlying formations.

The ray systems found about the surface of the moon are obviously different from each other in appearance, and probably in their origin. How far the rays stretch is in no way related to the size of the crater they radiate from, and the only thing they seem to have in common is that rayed craters are all relatively young craters.

Among the craters with rays, Tycho is the king. Some of the rays from Tycho extend 1,000 miles, while most cover at least 500 miles. The rays from Copernicus are slightly shorter on the average, Anaxagoras comes next, then Byrgius. The ray systems of Tycho, Anaxagoras and Byrgius are more or less symmetrical, with



little regard for mountain chains or rings in their path, and while the rays are not continuous lines, the various segments follow straight lines, which makes them look continuous and makes the whole moon appear to be cracked in the area of Tycho.

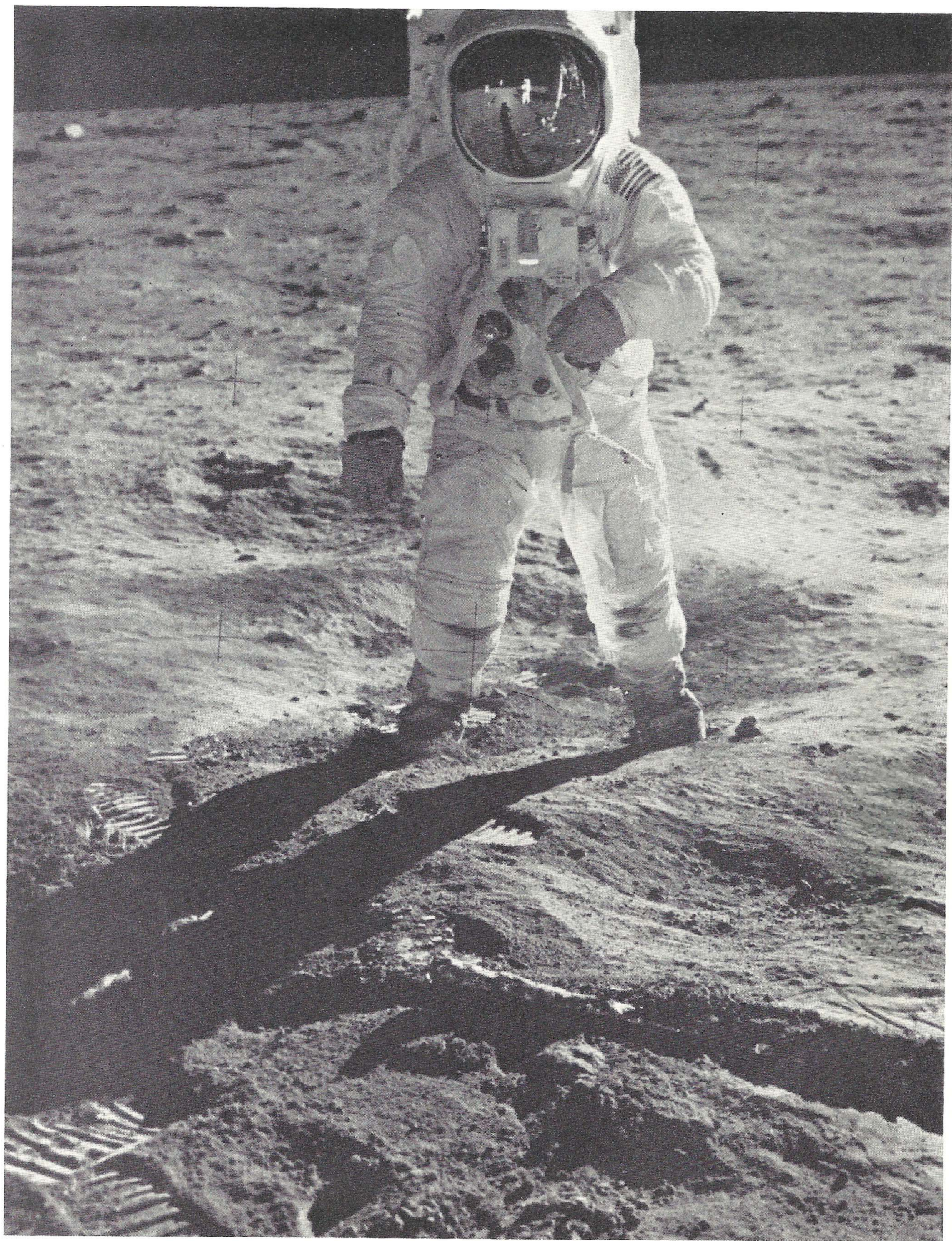
**F**inally, let's take a look at the actual mineral structure of the moon. Most of the samples so far brought back from our neighbor in space — the last samples we're liable to have for a while — consist of basaltic igneous rocks, microbreccias, which are a mechanical mixture of soil and small rock fragments compacted into a coherent rock, and lunar soil. The soil is a diverse mixture of crystalline fragments and glassy fragments with a variety of most interesting shapes. It also contains small fragments of iron meteorites. Most of the rock fragments are similar to the

larger igneous rocks and apparently were derived from them. The rocks, in turn, were probably part of the underlying bedrock of the moon's crust, broken out by meteoric impacts.

Many of the rock surfaces and individual fragments in the soil samples brought back show evidence of surface erosion by hypervelocity meteoric impacts. Examination of the surfaces of the glassy objects, which are themselves formed by impact processes, shows that they contain beautifully preserved microscopic pits as small as 10 microns in diameter, which are the result of impacts by tiny high velocity particles. There is also evidence that the impact processes were accompanied by local melting, splashing, evaporation and condensation of the rock.

The crystalline rocks, which have typical igneous structures, range from very fine grained vesicular rocks to





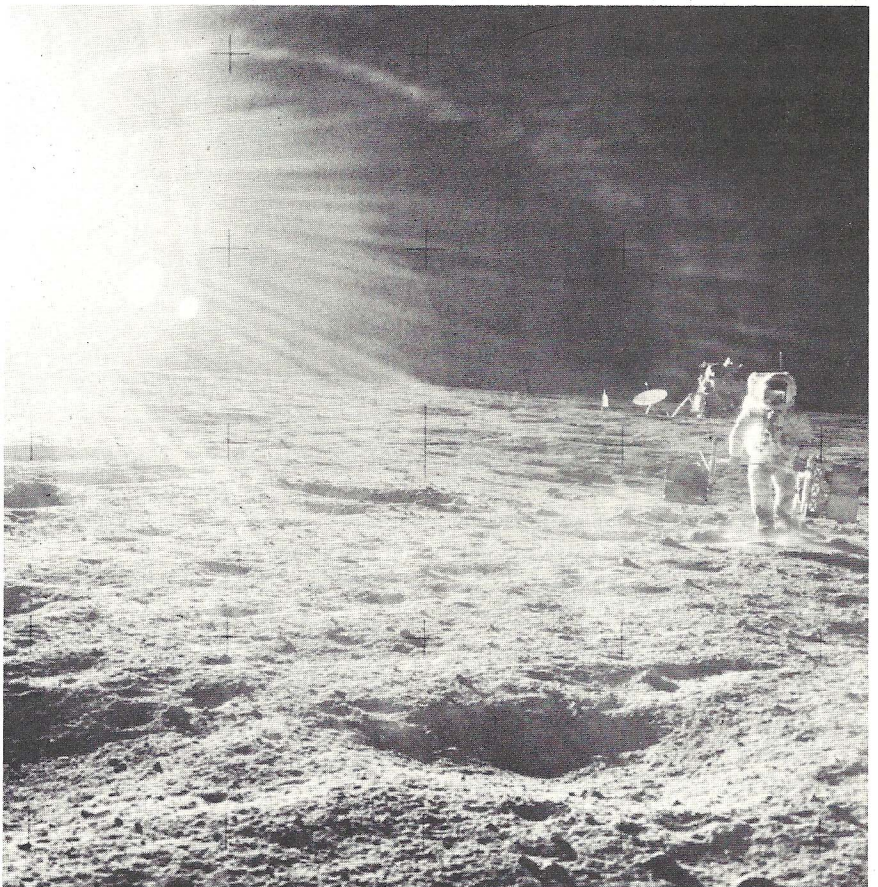
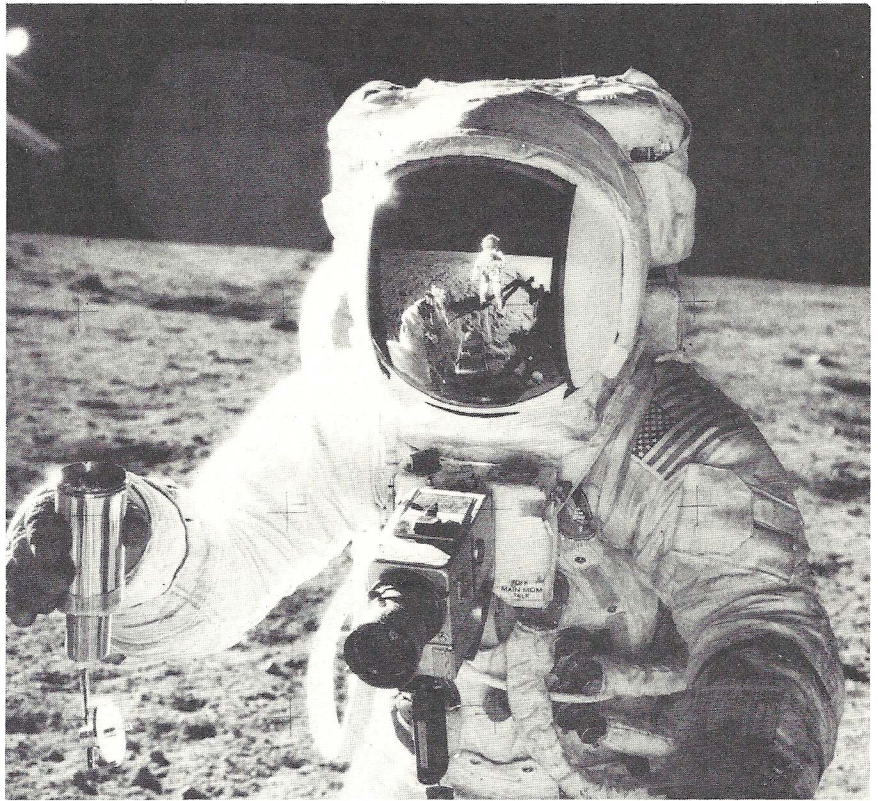


**Apollo 12's Charles Conrad, Jr. holds a core sample tube section which was used to obtain deep material samples from the Ocean of Storms. This information greatly advanced our ideas about the moon.**

medium grained equigranular rocks. The most common minerals found in the rocks are pyroxene, often highly zoned in the carrying rocks and with iron-rich rims to the zones, plagioclase, ilmenite, olivine, and cristobalite. Also, three new minerals were found in the igneous rocks. Pyroxmanganite, ferropseudobrookite, and a chromiumtitanium spinel. Free metallic iron and troilite, both of which are extremely rare on Earth, are common accessory minerals in the igneous lunar rocks.

The chemical composition of all the igneous rocks brought back from the moon is remarkably alike except for the concentration of potassium, rubidium, cesium, uranium, thorium, and barium. These elements distinguish two groups of igneous rocks. In general, the fine-grained rocks contain more of these elements than the coarse grained rocks. All rocks have unusually high concentrations of titanium, scandium, zirconium, hafnium, yttrium and trivalent rare-earth elements, along with low concentrations of sodium.

Before man went to the moon we knew, at least in general, what it looked like. Now we know much better what it looks like, and we even know what it's made of, at least in six different spots. It certainly doesn't look anything like what the science fiction artwork had made look like for years, and it certainly isn't made of just the same materials the Earth is made from. The moon is another world — with the differences you would expect from another world. The only problem is, our closer examination of this other world has raised even more questions than it has answered, and Selenography, the long-distance inferential science, finds itself with a new beginning — and with a whole lot more yet to learn. ○





# A MATTER OF TASTE

from page 52

tains that looked as though they needed another wash. The same jokes and simple-minded puzzles on the paper place mats. The faded formica table top that smelled faintly of ammonia.

"May I take your order, Sir?" the waitress said as she poured him a cup of coffee out of a plastic coffee urn. She looked the same too, except that her hair was black instead of blond. And she had just a suggestion of an accent.

"The cheese blintzes are very good, dear," his new companion said. "I know you don't feel much like eating at a time like this. But you really must keep up your strength. I'm sure your Mother would want . . ."

The cheese blintzes were as sickening as they looked. Thin pancakes stuffed with cream cheese, topped with wilted frozen strawberries in strawberry syrup.

"Isn't it wonderful?" the old woman said. "They have these places almost everywhere now. Why right in the middle of some horrid foreign country with its horrid people and horrid food, you can find an International Breakfast Barn. It's such a comfort when you're traveling. And nothing but other Americans eating there. My Herbert used to say, 'you can always trust an International Breakfast Barn to be . . .'"

Exhaustion, Darien decided, as he staggered away from the table. It was 10:45 A.M. and he had been up for nearly twenty-eight hours.

Drove further than I realized, he thought. All the way to Seattle. Seattle, Missouri.

Darien opened the door and stepped out into a parking lot that had an excellent view of the Eiffel Tower.

"Oh, no," he said. "Not a Breakfast Barn in Paris."

He had not taken three steps when he spotted a gendarme at the edge of the parking lot looking at him.

"Damn!" he said as he turned and walked back inside.

**O**ne for dinner?" the waitress said. She was wearing a pale orange uniform with a pale blue apron around her waist. Darien did not think she looked delicious at all.

He glanced over his shoulder to see if the cop were following and then looked around for cover. Suddenly, he screamed.

"What in the flying hell is that?" he said pointing toward the pale blue settee where he and his elderly companion had just finished eating thin pancakes stuffed with cream cheese and topped with wilted frozen strawberries in strawberry

syrup. The seats were now occupied by a short pale blue blob with six arms and six legs; and by a tall pale orange stick of a creature with two heads. They were eating cheese blintzes too.

"That, Sir, is the president of the Interplanetary Breakfast Barn, Inc., and her secretary. Have you just been reassembled or something?"

Darien stared at her and then made his way to the bathroom. The men's room was exactly like the men's room in the International Breakfast Barn he had been in twenty minutes before. Except that there were two extra urinals. One was two inches from the floor and the other was at about the level of his nose. While he was relieving himself in the middle one, the blue blob with the six arms and six legs came in, unzipped



six zippers, pulled out six appendages and with six hands, aimed all six of them at the lowest urinal.

"Jesus!" Darien said, leaning against the sink for support.

He looked in the mirror. There was stubble on his face. There were dark circles under his eyes and his eyes were red. He felt sick to his stomach from eating cheese blintzes and scrambled eggs. His head ached from lack of sleep. His ears buzzed from drinking coffee. Something smelled bad. He realized it was himself.

"Gotta get myself together!" he said and stripped off his shirt. He washed his

face and armpits. Then he sat on the toilet, rested his head against the toilet paper dispenser, and managed to get a few minutes of sleep.

"Been up for fifty-one hours," he told the cashier in Nairobi, Kenya, in the year 2143. "Been all the way from Paris to Rangoon. From the Moon to Mars. From the year 1961 to 2255. There's gotta be a reasonable explanation."

The cashier looked at him strangely and then at his card.

"I'm sorry, Mr. Lund, but this card has been canceled."

"Mr. Lund!" a voice said behind him. Darien turned and saw a tall, angry looking man. "I'm from the Billing Department, Sir. I'm sure that you are aware that your card specifically limits you to travel between your home time zone and the zone where you are doing your research. We understand that an anthropologist sometimes has to make an unexpected trip, or has to leave an unenlightened zone in a hurry—and we always try to work with you. But this is absurd. Not only did you not file a travel plan, but you have over extended your card by 50,000 credits."

The man stopped talking, looked at an instrument in his hand, and then looked at Darien again.

"You aren't Samuel Lund."

"No, I stole his credit card."

"You mean, you're a *Native*?" the man said and then groaned. "And you've just been joy riding around, right? Do you have any idea, any idea at all how expensive time travel is? No, of course you don't. Well, we'll just have to send you back where you came from. If, you'll walk through that door, please."

**T**here he is!" someone shouted as he stepped out into the parking lot. Two sheriff deputies grabbed him and handcuffed his wrists.

"You were right, Sam," one of the men called to the prison guard who was waiting by the car. "But how the devil did you know exactly where he'd be?"

"Just a hunch," Sam Lund said as they all got into the car. "You work with these guys and you get to know them pretty well. With some of 'em, it's women. With others, it's food." Sam turned around and looked at Darien. "Too bad you couldn't have waited a little longer for breakfast, boy," he said, eyes twinkling. "But then, them cheese blintzes are pretty good."

Darien had to spend two extra years in the Arkansas jail. But never once did anyone hear him complain about the food. ○



# AND NO POTATOES

from page 29

For Christ's sake man, get ahold of yourself or your mind will end up in a wooden shoe or a cupboard with no bones.

And so he walked, through endless corridors of cryonic capsules—huge filing cases filled with the undead, like crazy mixed up vampires, waiting for the sun to rise and the blood to flow.

And he was suddenly imbued with magnificence. He had the power—of life or death. They were all his, these undead, to do with as he wished. "I'm a King." He said it out loud. And his mind said grab hold of yourself. The future depends on you.

Awesome responsibility. That's what you have—awesome responsibility. Check all the capsules, make sure the machines are functioning properly, and the computers. Will they endure for several hundred years?

He came to the tanks of nutrament, checked them, and closed the monstrous lead-shielded doors. Would it spoil? What if the tanks sprung a leak. Leak? "Oh, God!"

You're talking to yourself. Sing Melancholy Baby. He did just that.

Inspection completed, Everything ship shape. All capsules functioning. Machines working. Computers humming. All are sleeping, all are sleeping, Brother John, Brother John—

He sat at the console and switched on the trideo screen. Thousands of feet above the fire storms raged and the diabolical cloak of radiation permeated the air and the earth, but not the hundreds of shields layered thousands of feet down and over his head. "Idiots." "Damned idiots." "It's Dante's Inferno come alive." "The World is Hell."

It's time for sleep. Time to become Rip Van Winkle. Go over to her capsule and kiss it gently. Say a mental good-bye and look forward to a roll in the hay two hundred years hence. "Christ, now you're a sex fiend." Go and prepare yourself. In the future the machines will roll back the rock and you'll be Lazarus.

"Go to sleep my ba-ba-by." You're in your second childhood, that's what you are—in your second childhood.

He lay down in the capsule and pulled fast the cover. The needles hurt. Never did like needles. All in. Push your button. Then you'll take your trip and awake from your long sleep and push other buttons, her's first of course, and then you'll both go around pushing buttons like mad.

Button, button, whose got the button? Rosebud! When I was a child I had a button that said Rosebud. My father had

found it on the moon. Who put Rosebud on the moon? Who put me in this damned capsule. Gotta wake and push buttons, wonder if I'll dream, if I'll dream—

I'm thirsty. He opened his eyes. He felt intensely alive. Of course, the stimulant. Instinctively he glanced at the dial. THE YEAR IS: 2198. It worked. It worked.

He rolled back the lid on her capsule. She opened her eyes and smiled.

"How do you feel?"

"You won't believe me."

"Try."

"Exceedingly sexy."

"At a time like this?"

"Can't help it."

And so the only living and breathing man and woman—breathed—fastly.



They lay in each others arms feeling like just after.

"What year is it?"

"2198."

"Hmmm. Not bad for a 237 year old man."

"You're incorrigible."

"And you like it."

"The others?"

"My God, there are others. We're mad, you know, you and me, we're mad."

They went over to the console and sat down. Buttons. Whatever would mankind have done without buttons. Push.

LIFE FORCES: All normal.

BLOOD LETS: A-OK.

CAPSULE FUNCTIONS: Perfect.

SURFACE CONDITIONS: Negative.

Panic. Push. Push.

EXTRA DATA: Radiation expected to continue indefinitely. Nothing will

grow.

"But, I thought they had it all figured out. The radiation was supposed to have diminished by now."

"So did we all. They were wrong."

"This is the part where I'm supposed to become exceedingly feminine and go to pieces, and you are to assure me that—. The tanks?"

Of course the tanks. Push.

Panic. Sick in stomach. Push.

NUTRAMENT TANKS: Empty.

Push.

EXTRA DATA: Earthquake. Cracked. Contents leaked and seeped through earth.

Their insides churned.

She looked him in the eye. "That means we can not go to the surface?"

"Right."

*His responsibility was to insure the survival of the people in his care. And that meant that his final responsibility was to insure the survival of the human race!*

"And there are no spare capsules?"

"Right."

"They're usable only once."

"Right."

"My God, we're Adam and Eve and nothing will grow in our garden, not even an apple. We have no food."

"We have no food. Nothing to eat."

She buried her head on his shoulder and cried softly.

It would be a lingering death, he thought, and toward the end they would probably hate each other. Nothing to drink, nothing to eat. And then his eyes widened as he glanced down the corridor and contemplated the contents of the capsules. "All that meat and no potatoes."

She stirred. "What did you say?"

He stroked her hair. "Nothing, dear, relax, everything's going to be fine, just fine. ○



# NOBODY LIVES AROUND HERE

from page 75

looked at me and I gave him the nod for the firemen, switching control over to my board. Scott was busy talking into his recorder, taking notes for the writeup later—got to account for every Destruct Dollar—but he stopped when Murphy nudged him and punched in the link for radio control to the firefighting units.

By this time most of Burton Street was on fire, so that everything you saw had a funny kind of orange look to it. The crowd was moving toward us once they'd lost interest in the cops, but we'd planned it that way. The firemen came running out in that jerky way they have, just a little in front of us. They were carrying a regular hose this time because it was a medium-sized group and we couldn't use up a fire engine and all the extras. But they were wearing the usual red uniforms and from a distance you can't tell them from the real thing.

Their subroutine tapes were fouled up again, though, because instead of heading for the barber shop or any of the other stuff that was burning, like I'd programmed, they turned the hose on a stationary store that nobody had touched yet. There were three of them, holding onto that hose and getting it set up, and the crowd had backed off a minute to see what was going on.

When the water came through it knocked in the front window of the store, making the firemen look like real chumps, and I could hear the water running around inside, pushing over things and flooding out the building. The crowd laughed, what there was of it—I noticed some of them had moved off in the other direction, over into somebody else's area.

In a minute or so the laughing stopped, though, and one guy who looked like he had been born mad and was going to stay that way grabbed an ax from somewhere and took a swing at the hose. He didn't get it the first time but people were sticking around to see what would happen and I guess he felt some kind of obligation to go through with it. Even under pressure, a thick hose isn't easy to cut into. He kept at it and on the fourth try a seam split—looked like a bad repair job to me—and a stream of water gushed out and almost got this guy in the face.

The crowd laughed at that too, because he backed off real quick then, scared for a little bit. A face full of high-velocity water is no joke, not at that pressure. The fireman who was holding the hose just a little down from there hadn't paid any attention to this because he wasn't programmed to, so when this

guy thought about it he just stepped over and chopped the fireman across the back with the ax.

It was getting too hot and I didn't feel like overriding the stock program, so it wasn't long before all the firemen were out of commission, just about the same way. A little old lady you would've trusted with your life savings borrowed the ax for a minute to be sure she'd separated all of a fireman's arms and legs from the trunk, and then, looking satisfied, she waddled away after the rest of the mob.

I stood up, lifted my faceplate and looked at them as they milled back down the street. I took out my grenade launcher and got off a tear gas cartridge on low charge, to hurry them along. The wind was going crosswise so the gas got carried off to the side and down the alleys. Good; wouldn't have complaints from somebody who got caught in it too long.

Scott was busy sending orders for the afternoon shift to get more replacement firemen and cops, but we wouldn't have any trouble getting them in time. There hadn't been much damage, when you think how much they could've done.

"Okay for the reclaim crew?" Murphy said.

"Sure. This bunch won't be back. They look tired out already." They were moving toward Horton's area, three blocks over.

A truck pulled out of the alley and two guys in coveralls jumped out and began picking up the androids, putting out fires as they went. In an hour they'd have everything back in place, even the prefab barber shop.

"Hellava note," Murphy said.

"Huh?"

"All this stuff," he waved a hand down Burton Street. "Seems like a waste to build all this just so these jerks can tear it up again."

"Waste?" I said. "It's the best investment you ever saw. How many people were in the last bunch—two hundred? Every one of them is going to sit around for weeks bragging about how he got him a cop or burned a building."

"Okay, okay. If it does any good, I guess it's cheap at the price."

"If, hell! You know it does. If it didn't they wouldn't be here. You got to be cleared by a psyker before you even get in. The computer works out just what you'll need, just the kind of action that'll work off the aggressions you've got. Then shoots it to us in the profile from HQ before we start. It's foolproof."

"I dunno. You know what the Consies

say—the psychers and the probes and drugs are an in—"

"Invasion of privacy?"

"Yeah," Murphy said sullenly.

"Privacy? Man, the psychers are public health! It's part of the welfare! You don't have to go around to some expensive guy who'll have you lay on a couch and talk to him. You can get better stuff right from the government. It's free!"

Murphy looked at me kind of funny. "Sure. Have to go in for a checkup sometime soon. Maybe that's what I need."

I frowned just the right amount. "Well, I dunno, Joe. Man lets his troubles get him down every once in a while, doesn't mean he needs professional help. Don't let it bother you. Forget it."

Joe was okay, but even a guy like me who's never been married could tell he wasn't thinking up this stuff himself. His woman was pushing him. Not satisfied with what she had.

Now, that was wrong. Guy like Joe doesn't have anywhere to go. Doesn't know computers, automation. Can't get a career rating in the Army. So the pressure was backing up on him.

Supers like me are supposed to check out their people and leave it at that, and I go by the book like everybody else. But Joe wasn't the problem.

I made a mental note to have a psyker look at his wife.

"Okay," he said, taking off his helmet. "I got to go set up the AnCops for the next one."

I watched him walk off down the alley. He was a good man. Hate to lose him.

I started back toward our permanent operations center to check in. After a minute I decided maybe I'd better put Joe's name in too, just in case. Didn't want anybody blowing up on me.

He'd be happier, work better. I've sure felt a lot better since I had it. It's a good job I got, working in public affairs like this, keeping people straight with themselves.

I went around the corner at the end of the street, thinking about getting something to drink, and noticed the mailbox. I check on it every time because it sure looks like a mistake.

Everything's supposed to be pretty realistic on Burton Street, but putting in a mailbox seems like a goofy idea.

Who's going to try to burn up a box like that, made out of cast iron and bolted down? A guy couldn't take out any aggressions on it.

And it sure can't be for real use. Not on Burton Street.

Nobody lives around there. ◊



# GUILTY AS CHARGED

from page 33

one's privacy when we never cracked the code!" said Whitman.

He had a good point and the Chief Thumbie admitted it. "Very well, the third charge will be changed to *attempted* invasion of privacy. Now there can be no question but that the people of Planet Earth, subdivision USA are guilty on all counts."

"One moment," I said. "Are we to understand that you are implicating the entire country in this so-called guilt?"

"You are."

"That's preposterous! Good Lord, nine-tenths of the people have never even heard of Arcibo."

"Ignorance of the law is no excuse," said the Chief.

"It isn't just ignorance of the law; it's ignorance of the whole project! The

people have nothing to do with it; most of them don't even know it exists."

"Hmmm." He turned to Whitman. "Where do your research funds come from, Doctor?"

"Partly from Cornell University, partly from the Federal government."

He turned back to me. "Mr. Justice, where does your government get its money?"

"From taxes."

"And who pays these taxes?"

"Well, the people. But that doesn't make them guilty; they have no choice in the matter."

"What would happen if they refused to pay?"

"They would be put in jail."

"Ah! Now if the majority—by the way, you do accept the principle of majority

rule?"

"Yes."

"So—if the majority of your countrymen refused to pay taxes, could your jails hold them all?"

"Of course not."

"Then if that occurred, there is actually no way the tax laws could be enforced?"

"Well, no."

"Then it seems obvious that a majority of your people do *not* object to this taxation."

"But they don't know their taxes are being spent on *this*. The money is taken from them and spent on projects they have no control over and in most cases don't even know about. Even if the Arcibo staff is guilty—"

"Hey, wait a minute!" yelled Whitman.

"—the people as a whole are surely innocent."

"They are not," said the Thumbie. "I repeat: ignorance is no excuse. They could easily ascertain the existence of the Arcibo project and the fact they are paying for it. By the principle of majority rule, they are bound by the will of the majority, which in this case is clearly not opposed to the functioning of this project. Therefore, I find the people of Planet Earth, subdivision USA, guilty as charged. Sentence, as per usual, will be executed tomorrow morning. Court dismissed."

Nancy was happy to see that *absent* look leave her husband's eyes as he finished the story. Perhaps the act of telling had eased the hold this fantastic dream had on his mind. "I wasn't a very good advocate, was I?" he said, taking a sip of orange juice.

Nancy smiled—she had her husband back again! "You had a tough opponent, dear." She got up. "Do you mind if I open the drapes? After that story, we need a little sunshine!" She walked to the windows, reached for the cord.

Mr. Justice Kleinfeld drank the rest of his orange juice. Ah, delicious! Good Lord, to get so worked up over a dream! Incredible what a man's unconscious could come up with. Still, you couldn't call it complete nonsense. That point about individual responsibility . . . He turned to his wife. "You know, darling, I—*Nancy! What is it?*"

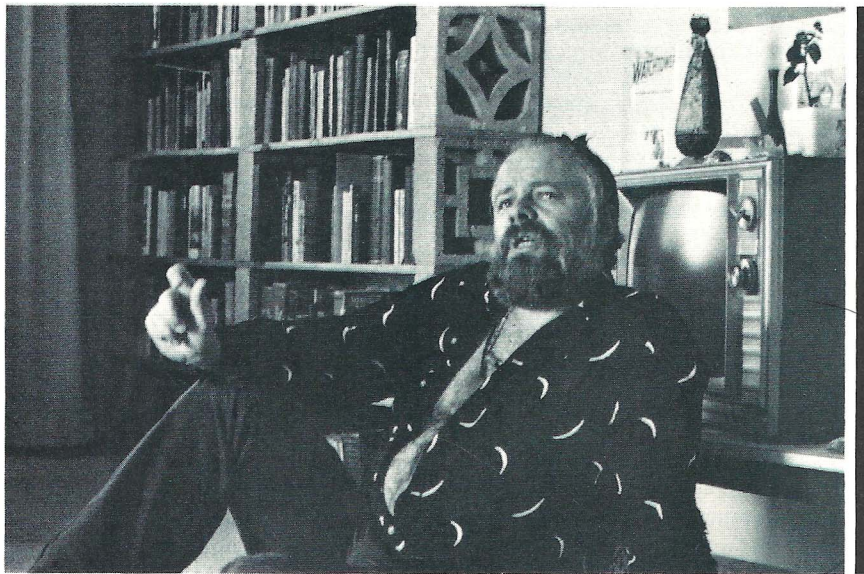
She had opened the drapes and now stood transfixed, staring out of the window.

He followed her gaze. "Oh my God," he said softly. ○



***Judge not, lest ye be judged. And rule not,  
lest those same rules be turned against you,  
to your everlasting regret.***





*“I saw the need of an illegal rebellion against what is basically an illegal system. In other words, you can’t say to a kid, ‘Don’t break the law. Always obey the law,’ because the law in itself is unjust.”*

used to say about it on the blurbs of my books. I wrote this myself: “He has been experimenting with hallucinogenic drugs to find the unchanging reality beneath our delusions.” And now I say, “Good Christ!” All I ever found out about acid was that I was where I wanted to get out of fast. It didn’t seem more real than anything else; it just seemed more awful.

**VERTEX:** In the light of your own experiences with acid, how accurate do you think *The Three Stigmata of Palmer Eldritch* is as far as drugs are concerned?

**DICK:** You remember what happened when they got on that drug? It was bad, wasn’t it? It was so bad it taxed my ability to imagine bad. And it didn’t do them any good to stop taking the drug because they had flashbacks. And nobody at the time knew LSD was going to produce flashbacks. I had it in mind that the ultimate horror would be to get an addictive, hallucinogenic drug out of your system and you would say, “Well, I’m back in the real world now.” And suddenly a monstrous object from the hallucinogenic world would cross the floor and you would realize that you were not back. And this is what has happened to many people who have dropped acid. It was just an accidental prophesy on my part.

**VERTEX:** Doesn’t your latest novel, *A Scanner Darkly*, also deal with drugs?

**DICK:** It’s about an undercover agent who must take dope to conceal his cover and the dope damages his brain progressively, as well as making him

an addict. The book follows him along to the end until his brain is damaged to such an extent that he can no longer wash pots and pans in the kitchen of a rehabilitation center. I hope the reader won’t say, “Boy! I bet he did that!” This is the versimilitude the author is trying to create, the sense that the novel actually is real. Now I was at a heroin rehab center in Canada, and I did draw from it, and I’ve had friends who dropped acid and became permanently psychotic. And a number who killed themselves too. But I wouldn’t say that it affected my writing directly, that the acid wrote the book.

**VERTEX:** Would it be fair to ask if your interest in people’s perceptions of reality and unreality is an outgrowth of the trick ending of the fifties?

**DICK:** Which was required of us at the time. That is a good question because it is one of those paradoxical questions that one can answer truthfully by saying yes and by saying no.

**VERTEX:** Well, it seems that eventually you worked in your surprises with a vengeance and transcended what Sheckley had done. It had become an integral part of your writing.

**DICK:** At the time in writing magazine fiction, you started the story conventionally knowing something the reader did not know until you sprang it on him at the end. That motif evolved out of the mystery story. And I did the same thing over and over again, and that was what the protagonist thought was real was not

real, actually. That was my idea of the surprise ending. I did it so many times that it became predictable in my writing.

**VERTEX:** What was the reason for that?

**DICK:** Why I would surprise my reader with the same surprise a hundred times? Well, let me quote you from a text by Gilbert: “Things are seldom what they seem/Skim milk masquerades as cream.” It just seemed to sum it up in life. I think the main thing in my writing was that I was trying to show my characters taking things for granted, and then realizing that things were quite different, you see. And the clue there is that they had taken it for granted; they had accepted it without testing it out.

**VERTEX:** Do you use the I Ching as a plotting device in your work?

**DICK:** Once. I used it in *The Man in the High Castle* because a number of characters used it. In each case when they asked a question, I threw the coins and wrote the hexagram lines they got. That governed the direction of the book. Like in the end when Juliana Frink is deciding whether or not to tell Hawthorne Abensan that he is the target of assassins, the answer indicated that she should. Now if it had said not to tell him, I would have had her not go there. But I would not do that in any other book.

**VERTEX:** What is the importance of the I Ching in your own life?

**DICK:** Well, the I Ching gives advice beyond the particular, advice that transcends the immediate situation. The answers have an universal quality. For instance: “The mighty are



humbled and the humbled are raised." If you use the I Ching long enough and continually enough, it will begin to change and shape you as a person. It will make you into a Taoist, whether or not you have ever heard the word, whether or not you want to be.

**VERTEX:** Doesn't Taoism fuse the ethical and the practical?

**DICK:** This is the greatest achievement of Taoism, over all other philosophies and religions.

**VERTEX:** But in our culture the two are pitted against one another.

**DICK:** This always shows up. Should I do the right thing or the expediate thing? I find a wallet on the street. Should I keep it? That's the practical thing to do, right? Or should I give it back to the person? That's the ethical thing. Taoism has a shrewdness.

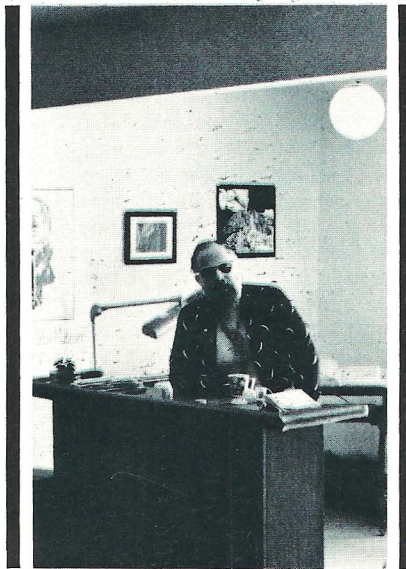
There's no heaven in our sense of the word, no world besides this world. Practical conduct and ethical conduct do not conflict, but actually reinforce each other, which is almost impossible to think of in our society.

**VERTEX:** How does it work?

**DICK:** Well, in our society a person might frequently have to choose between what he thinks is practical and what is ethical. He might choose the practical, and as a result he disintegrates as a human being. Taoism combines the two so that these polarizations rarely occur, and if possible never occur. It is an attempt to teach you a way of behavior that will cause such tragic schisms not to come to the surface. I've been using the I Ching since 1961, and this is what I use it for, to show me a way of conduct in a certain situation. Now first of all it will analyze the situation for you more accurately than you have. It may be different than what you think. Then it will give you the advice. And through these lines a torturous, complicated path emerges through which the person escapes the tragedy of matrydom and the tragedy of selling out. He finds the great sense of Taoism, the middle way. I turn to it when I have that kind of conflict.

**VERTEX:** What if a person should come to a situation in which the ethical and the practical cannot be fused under any circumstances?

**DICK:** One thing that I have never gotten out of my head is that sometimes the effort of the whole Taoist thing to combine the two does not always work. At this point the line says, "Praise, no blame." Those are code words to indicate what you



should do and the commentary says that the highest thing for a person to do would be to lay down his life rather than to do something which was unethical. And I kinda think that this is right. There never can be a system of thought that can reconcile those two all the time. And Taoism takes that into account, in one line out of over three thousand.

**VERTEX:** You mentioned that you spent some time in a heroin rehabilitation center in Canada. How did you get involved in that sort of endeavor?

**DICK:** It was one of the most important things that ever happened to me. I flew to Canada in February of 1972, to deliver a speech as the guest of honor at the Vancouver Science Fiction Convention. I felt a tremendous weight off me when I got up there. I was sick and tired of the oppressive air of the war back here. So I rented an apartment and cut my ties with the past. But I had no friends up there and after awhile I was very lonely. I tried to kill myself by taking seven hundred miligrams of potassium bromide. I had also written the phone number of a suicide rehabilitation center on a piece of cardboard as huge as a phonograph album, in huge letters, just in case I changed my mind. And I did change my mind. Fortunately the last number was a one and I could just barely dial it.

Well, I talked with the guy for almost an hour and a half and he finally said, "Here is what is the matter. You have nothing to do; you have no purpose; you came up here and you

gave your speeches and now you're sitting in your apartment. You don't need psychotherapy. You need purposeful work."

**VERTEX:** And he directed you to the heroin rehab center.

**DICK:** Right. He told me that they would watch me twenty-four hours a day, that no matter what they would keep me alive. But I had to lie to get in; I had to pretend I was an addict. I looked in bad shape, you see, from all that potassium bromide. I did a lot of method acting, like almost attacking the staff member interviewing me, so they never doubted that I was an addict.

**VERTEX:** What did you do there?

**DICK:** They put me to work cleaning the toilets and scrubbing the floors. And it was wonderful. I really dug it. The first night there was the first good night's sleep I had had in three months. After I had been there for about two weeks I started coming out of my depression and they discovered who I was. They had thought I was just some deteriorated bum. Well, a bunch of my books came in the mail and they immediately put me in an office with a typewriter and all that jazz to do PR work for them. So I left after awhile.

**VERTEX:** Exactly what did you do there that you liked so much?

**DICK:** Watching the junkies come in and watching their valiant struggle not to fall back into what they had been doing. I used to condemn junkies, like they could get off the stuff if they really wanted to, and that is about as stupid as saying, "You could grow eyes in the back of your head if you really wanted to." The pain of getting off smack is so great that there are many times they'll kill themselves just to get off the pain. I saw one chick who had been addicted by her brother when she was fifteen, and by the time she was sixteen she was a prostitute, for the money, you see. And she didn't look sixteen; she looked twenty-five. Another chick who was twenty-five looked fifty. Half her teeth had fallen out; her hair was grey, wispy, straw-like stuff; she was just skin and bones. But these people wanted to live. I saw human strength. I saw the human being there as a magnificent creature. And when I saw that I realized that I had seen something which made the events preceding my life of very little importance.

**VERTEX:** What methods were used there?



# THE MARS STONE

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**DICK:** Our method there was cold turkey. I mean, their bodies were so damaged from the heroin they had to get up and pee every two hours every night from kidney damage. But I watched those people forming a community and I saw human beings fighting with such strength against fate . . . We also had the hardest attack therapy. It was tough because it was mainly for criminal recivitists. It was for really tough guys.

**VERTEX:** And you didn't want to do PR work? What did you really want to do?

**DICK:** I wanted to work directly with teenagers before they got onto the hard stuff, while they were still on the soft stuff. And I also was homesick. I wanted to come back to the United States.

**VERTEX:** In the light of that experience, what are your opinions of the way addicts are treated in this country?

**DICK:** I would never condemn an addict, but on the other hand I would condemn anyone who addicted someone. Like Julian Bond said—remember Congressman Bond—kill the pusher man, if you have to. If he is going to make your children into a junkie, shoot him. Now that's an extreme view, see? Like a lot of people would lump the users and the dealers together. But I realized that the user is a victim. You cannot be any more of a victim than the user of heroin is. There is no slavery like it.

**VERTEX:** You've stated privately that your Vancouver speech is the most important thing you've ever written. Would you care to elaborate on that statement?

**DICK:** I worked on it for three months and I was very low in those days. I had thought that I would never write again. I had actually gone for two and a half years without writing anything. I decided that I should take all the ideas I had in my head that were worth anything and put them in the speech. It was finished in January 1972 and it said that the totalitarian state Orwell had predicted was already with us and that rebellion against this evil and corrupt state was already with us. The title of this speech was "The Human and the Android," subtitled "The Authentic Person Vs. the Reflex Machine."

**VERTEX:** What did you try to accomplish in this speech?

**DICK:** I tried to define the real person, because there are people

among us who are biologically human but who are androids in the metaphoric sense. I wanted to draw the line so I could define the positive primary goal of stipulating what was human. Computers are becoming more and more like sensitive cogitative creatures, but at the same time human beings are becoming dehumanized. As I wrote the speech I sensed in it the need for people who were human to reinforce other people's humanness. And because of this it would be necessary to rebel against an inhuman or android society.

**VERTEX:** What do you believe defines a human being?

**DICK:** For example, the capacity to say no when what one was told to do was wrong. Someone saying, "No, I won't kill. I won't bomb." A balking. And this balking I saw in the teenagers, in the so-called "punks." A non-political rebellion of the youth which in the long run, without their realizing it, had very great political significance. Not in terms of elections and parties, but with the emergence of kids who could not be bribed, who could not be intimidated, who would not listen to propaganda. I saw the need of an illegal rebellion against what was basically an illegal system. In other words, you can't say to a kid, "Don't break the law. Always obey the law," because the law was in itself unjust.

**VERTEX:** Do you feel that recent events such as the Watergate hearings have supported the ideas expressed in the speech?

**DICK:** I think—and this is perhaps a strange thing to say—that those people in the Administration who broke the law should be forgiven, also, for breaking the law, just as those I feel should rebel should be forgiven. Everybody on both sides is sort of saying that the law is no longer meaningful, that it is no longer equated with justice. I think it was Jeb Magruder who said, "We found it frustrating to have to operate within the law." Perhaps that is just an indication that a vast revision of our legal system is in order. Nevertheless, my speech did advocate rebellion and breaking the law in the name of morality. And like the I Ching said, if practicality and morality are polarized and you must choose, you must do what you think is right, rather than what you think is practical.

**VERTEX:** Thank you very much, Mr. Dick. ○

the project *Mars*) was considered a success, but we really didn't hit the headlines until the third day.

Johnson and I were going along in the Rover, minding our own business, and heading for the Canal Crater. We got there a little behind schedule so we cut down our exploration time some. I was just about to go back to the Rover with my samples when I saw something strange on a large rock that I was passing by. I looked closer and couldn't believe my eyes.

"Ben!" I yelled.

He came puffing over, weighed down by both the suit he had on and the rocks he was carrying, thinking I'd broken my leg or something. When he saw what I was looking at he nearly went off his rocker too.

It was writing. It had to be. Words carved into the face of the stone. Real words in some strange language. We rigged up both the movie camera and the television camera for shots of it, and then asked Mission Control what they wanted us to do about it.

"For crying out loud, man, get it out of there and bring it back," the man said. So we got out hammers and chisels and chipped it out of the stone.

I was astounded at the possibility that thousands of years ago some Martian had come along and written whatever on that rock. The chances of it surviving for so long must have been microscopic. Yet, we had it stowed away with the rest of the souvenirs we were bringing home to earth.

I couldn't help thinking, all the way back, that the writing was on the wall.

It took them four years to decipher the writing, and it turned out to be nothing more than an old army code used way back when. They found that out when they came up with a process that determined when the actual *carving* of the stone took place.

It's bad enough that so many people don't really give a damn about space travel anymore, they've become so bored with it. But when the few people who do care and look up to you as being the *first* to land somewhere, anywhere, when they're taken away from you, and your pride is deflated, and you feel downright *frustrated*, then you're shaking hands with suicide.

But I still say they can't really be sure that I wasn't the first. It's just too hard to believe that some joker from 1945 got there before me. Even if the stone *did* say that:

**KILROY WAS HERE. ○**



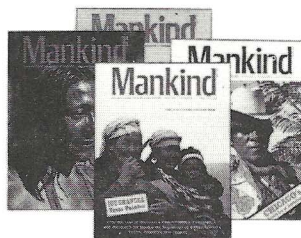
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