POLITICS OF SPACE • NEW HORIZONS IN SUBLIMINAL PERSUASION • MALCOLM FORBES ON THE FUTURE OF CAPITALISM • THE SHAPE OF THINGS TO COME
"Vigorous program and development of manned's readers are already actively pushing for a stronger space effort. It's time for the rest of us to get directly involved. The United States is rapidly losing its preeminent position in space exploration. Before it's too late, we must remind our leaders that their failure to support an increasing space effort will irreversibly hurt the nation and their own political careers.

We are on the threshold of mankind's ultimate dream, the expansion of human civilization into space. The vast abundance of resources beyond our earth will generate an explosive renaissance of Earth before the turn of the century. "We don't do it, somebody else will," said James Michener in a recent speech. The United States, he said, is now in a position similar to that of Spain and Portugal in 1510 when the two countries had a choice either to expand their mastery of the seas or to let somebody else do it. Choosing the latter, Spain and Portugal suffered an economic and moral decline that lasted for centuries. The manned lunar Apollo missions and unmanned planetary flights like Cernan's historic voyage have opened our eyes to new worlds that are "in Carl Sagan's words, crying out for exploration.

Mastery of space is paramount for mastery of our collective future. Engineering studies show there are many feasible, independent, and economic paths leading to potentially huge industries in space: satellite solar power, orbiting factories, space stations, and asteroid mining, to mention just a few. But we must start now.

What can we do?

We must remind the President and those who represent us in Congress that the Soviet Union is planning to orbit a permanent 12-man space station in 1986. We must remind them that several probes will be sent to Halley's Comet during its once-in-a-lifetime appearance in 1985 and 1986, although none of the probes is likely to carry American insignia.

We must remind them that Starship, a new shuttle flight, will attend the space shuttle flights because of a lack of funds, and that few shuttle missions will be sponsored by NASA. We must remind them that the U. S. civilian space program, between now and 1986, will be in cold storage because of few fresh starts (a single space mission requires at least five years from the time of commitment to the completion date). We must advise our elected representatives that if Congress does not reverse this trend quickly we will surely suffer the consequences of our lost leadership somewhere in the late 1980s.

How can we reverse this perilous trend? Fortunately, as in the early years of the environment movement, there is an ever-expanding constituency of individuals who perceive the immense potential of space and the danger of an imminent loss of American leadership. Trudy Bell points out in an article elsewhere in this issue that tens of thousands of motivated people have joined the 40 or so citizen-supported groups that advocate an augmented national space program. About two thirds of these groups came into existence in the past three years, swarming an interest that is in vivid contrast to a dwindling NASA effort. The movement is not confined to the United States. It is worldwide. Much work needs to be done. We have to broaden the base of the space-supportive constituency. Only one out of every 100 Omni readers is now a member of some space-advocacy organization. The 99 others need to know that they too can become activists. Look at Trudy Bell's mailing list starting on page 90 and find out how you can join.

Over the coming months, the Omni staff and I will begin to link up a broadly based coalition geared toward reinvigorating our national space program. We will be in contact with individuals and agencies involved in space-oriented activities, administrators and elected politicians. We will be circulating pamphlets that tell what you can do as a citizen. We will be appearing on television programs and will be traveling throughout the country giving lectures and showing films. We will be distributing newsletters to instruct you in how to write to various important elected officials and critical issues come up. You can become an activist.

This is a call to battle. Those of us who persist in charging tire outlook of a sluggish, useless national leadership will be on the ground floor as pioneers of mankind's greatest adventure, conquering the high frontier. History has shown that people matter and that grassroots politics do work.

Last year the 1984 Galileo orbiter mission which will study Jupiter was killed in Congress. But in an extraordinary last minute lobbying effort organized by the Space Advocate Mission, the 40 or so citizen-supported groups that advocate an augmented national space program. About two thirds of these groups came into existence in the past three years, swarming an interest that is in vivid contrast to a dwindling NASA effort. The movement is not confined to the United States. It is worldwide. Much work needs to be done. We have to broaden the base of the space-supportive constituency. Only one out of every 100 Omni readers is now a member of some space-advocacy organization. The 99 others need to know that they too can become activists. Look at Trudy Bell's mailing list starting on page 90 and find out how you can join.

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With no way of reaching Mars on a return trip to the moon in this century and little hope of a Halley's Comet space probe by 1986, the once-grand U.S. space program has come virtually to a halt. However, even as the Soviet Union and other nations push onward, a combination of shortsightedness and neglect has pushed the United States into a tragic slide, dampening the enthusiasm that once sparked a mighty effort. How can we reverse this trend and restore our place in space? Through activism. As the environmentalist movement of the 1970s amply demonstrated, intelligent militancy can succeed. Early last year Omni editorialists pointed out the dangers inherent in the U.N. Moon Treaty. Along with the L-5 Society and concerned individuals, Omni was able to convince Senate leaders that the treaty should not be ratified. The Carter Administration abandoned its intention to press for the treaty.

Activism works, says Brian O'Leary, aeronaut, and Omni's new special advisor on space affairs. "Now is clearly the time for a united voice to speak out on behalf of the space program. In this month's First Word (page 6), O'Leary makes a passionate plea that the resurgent grass-roots enthusiasm for space be expressed as a single voice, articulating our concerns. An experienced speaker and writer on space policies, O'Leary regularly lectures to diverse audiences around the world. He has written numerous articles for the New York Times, Science, Astronomy, New Scientist, and the Bulletin of the Atomic Scientists. His popular book The Making of an Ex-Astronaut was named the best young adult book of 1970 by the American Library Association and has been published in four European countries.

Joining O'Leary in the call for space activism is science writer Trudy E. Bell, whose Space Activism (page 50) contains a concise listing of those space-minded organizations that advocate an augmented U.S. space program. Bell was on the editorial board of Scientific American for eight years, is a former senior editor of Omni, and has written several articles on space exploration. Her America's Other Space Program received a top writing award from the Aviation/Space Writers Association.

A bottle of hard liquor at $125? Artificial eyesight for the blind? The Persian Gulf out of oil? Hard to believe. Yet 20 years ago it would have been difficult to persuade people that today there would be portable computers, microwave ovens, and test tube babies. David Wallechinsky, Amy Wallace, and Irving Wallace remind us in their new work, The Book of Predictions, that in the light of the recent past there is no reason to disbelieve in the advent of new miracles. This month Omni presents an exclusive excerpt from The Book of Predictions, beginning on page 68. Wallechinsky is creator of The People's Almanac, which he coauthored with his father, Irving Wallace. Amy Wallace, Wallechinsky's sister, is a graduate of the Berkeley Psychic Institute in California. She has written The Two, the first major work on the traumatic life of Siamese twins. Irving Wallace is one of the most widely read novelists in the world. His books include The Chapman Report and The Prize both best sellers.

Also in this issue is an exclusive excerpt from Paday Chayefsky's latest novel, Altered States (page 74). Accompanied by visuals from the new Ken Russell film of the same title, Chayefsky's mind-chilling work takes us on an astounding trip into the unknown. One of America's major dramatists, Chayefsky was born in the Bronx in 1923. His TV screenplay Marly was the first TV drama to make the transition to a motion picture. The movie won Chayefsky the Academy Award and the Grand Prize at the Cannes Film Festival. Other acclaimed Chayefsky films are Hospital and Network. Humorist Eric Lander reports on a subliminal perception in In Through the Out Door. Can we be influenced without being consciously aware? Join Lander as he examines this highly controversial subject beginning on page 44.

Japanese science fiction makes its Omni debut with Yasutaka Tsutsui's "Standing Woman" (page 58). Tsutsui is one of the Orient's leading science-fiction writers. Complementing this story is a special report on Japanese science fiction, with a gallery of art. "Eastern Exposures" starts on page 1000.
Cool Common Sense
I was disappointed that Jeff Rovin [The Arts, November 1980] compared the antinuclear movement to the suppression of Galileo. Mr. Rovin obviously has not explored the issues in question. Most nuclear power opponents are not hot-headed fanatics, they are thoughtful, intelligent, well-informed practical people. They oppose using a nuclear-power plant to run refrigerators so inefficiently that more energy is needed to cool the motor than is necessary to keep food cold.

The objection to the use of nuclear power, not to the science of nuclear power. Using nuclear power to heat water is like using a shotgun to kill a fly. Nuclear power has much greater potential for space exploration and medicine. Far from being antiscience, opponents of nuclear power look to solar technology to provide an alternative source of energy.

Rovin asks us to use "cool common sense." Is he, in common sense to burns a forest to boil a pan of water?

Cynthia Albert
Monmouth, Me

Beast Goddess
It is highly encouraging that in the two-dimensional world of science and technology Omni has recognized that God and the spiritual dimensions of life are still very much alive. It has been said that science fiction is really modern mythology portraying the deep issues of life, meaning, and eternity.

Paul J. Nahin's "A Father's Gift" [August 1980] deals with the well-worn theme of what really happened to the body of Jesus Christ. The surprise ending however makes it all worthwhile. Robert Silverberg's contrasting "Our Lady of the Sauropods" [September 1980] revives the ancient motif of the nature goddess fascinating and beautiful but menacing to humanity. "Rautavaara's Case" by Philip K. Dick [October 1980], portrays the depth of demonic depravity to which science can fall, treating even belief in the Savior as the subject of experiment without concern for the believer.

So we are brought back again to Nahin's concern, which is the primary spiritual issue of the Age of Science. Can the body be reassembled by its creator or does the Beast Goddess have the last word?

David M. Bowring
Toronto, Ont., Canada

Peel Pipes
I recall an idea similar to one that was mentioned in "Garbage Bricks" [Continuum. September 1980] that was developed in Florida some decades ago, when the orange-juice industry had to find a disposal site for orange peels. The pipe was too acidic to return to the soil and not much good for fodder but someone discovered a way to bond these peels with paper and tar, forming Orangeberg pipe. This Orangeberg was used by building contractors as an economical and ecologically practical source of sewage/irrigation pipes.

But as time passed more and more people found that the pipes began to dry out in the tropical heat, eventually flaked and collapsed and had to be replaced with the old steel or fired-clay pipe.

When new technology fails, there will always be the old technology of sweat and shovels to set it right.

Let's bury our refuse, or find some long-lasting use for it. I refuse to dig any more of it up.

Norman Michael Balog
Augsburg, West Germany

Overprivileged?
I must take exception to some of the comments made in Omni's December issue. All through the First Word, there's talk of the United States in space as if there is some fanatical desire to get there first and as if there is some disadvantage in getting there second. Surely it would be cheaper to learn from others' mistakes.

We should be trying in these troubled times to cooperate with one another in order to use the resources of the moon and other celestial bodies for the betterment of mankind, rather than for one already overprivileged minority.

Quite frankly if all the U.S. space program is going to be huge, let the arms race into space. I hope they stay down here and help solve the world's more immediate problems first.

Robert Bailey
St. Albans, England

COMMUNICATIONS
BRAIN WAVES IN ADVERTISING

A recent letter from an advertising agency in Canada [Forum, October 1980] contains a series of fatuous statements about the use of brain-wave analysis in advertising. The writer claims to have conducted research on brain-wave analysis before concluding that the technique won't be used. We assume his research was conducted in a library. To refute each of the statements in detail is impossible in a brief letter. We trust the following will suffice:

1. The literature on behavioral responses of surgically treated epileptic split-brain patients that he cites has no relevance to studying the brain waves of normal people watching television.

2. The hemispherical differences he failed to find (in our own published report in the Journal of Advertising Research) dealt with specific companion animals and not with a methodological or theoretical failure. We routinely find many hemispherical differences in our tests of commercials and even in tests of parts of commercials, print ads, etc.

3. Our findings of differences between the cerebral hemispheres are far from unique. There are hundreds of articles in the scientific literature that report these same phenomena under many conditions.

4. The non-secular that "brain wave scanning is born out of the biofeedback fad" is false on two counts. First, biofeedback as currently employed by physicians in numerous hospitals around the world is a valid therapy not a fad. Second, brain wave analysis is totally unrelated to biofeedback treatment, which uses physiological recordings such as heart temperature and blood pressure as the basis for gleaning information.

5. The statement that the use of brain-wave analysis in advertising is a flash in the pan is patently false. It started ten years ago when Dr. Herbert Krugman of General Electric published the first article on the relation between brain waves and advertising. The number of published articles on advertising agencies using the service, and clients who employ it has risen dramatically over the decade.

We suggest that the writer conduct not a library research on irrelevant topics but an empirical laboratory test. He may find that brain wave analysis increases his agency's effectiveness in providing better advertising for its clients. Or does he fear that use of a valid test of commercials by his clients may reveal some weakness in his product that he would prefer remained obscure?

Sidney Weinstein, Ph.D.
Danbury, Conn.

CREDIT WHERE IT'S DUE

I read with great interest R. Bruce McCoed's article "Eccleseller" [October 1980]. I was somewhat dismayed however by the last paragraph in which Mr. Roy Mason apparently took credit for a concept that I first made public in 1972. I presented this idea to Mr. Mason in 1975 in a short paragraph very roughly describing the basic concept of my thought structures. This description was included in an article for The Futurist magazine at that time.

My thought forms have also been the subject of articles in Architectural Design and Domus. I do not wish to take anything away from Mr. Mason, but I want people to be aware that the thought structures are my idea alone.

Michael Jantzen
Carlyle, Ill.

EXTRA-MISSING LINKS FOUND

I've just mailed my third entry to your "Links" competition. I scribbled down a few names after reading Omni, and the links began to occur almost automatically. Now I have a problem. How do I stop?

Don Wall
New York, N.Y.
The day promises to be a profitable one. Working quickly and efficiently, the crew of the whaling ship Sierra begin to slaughter and flense. They wrench the mamma out of their environment, process them freeze them, and hurriedly jettison the waste.

The flag of Cyprus flaps overhead, but the registration flag is changed frequently to camouflage the Sierra's activities. The captain is Norwegian, the crew is South African: the cargo is meant for the Japanese. They are modern-day pirates—whalers roving the seas, freely pillaging nature's bounty, unchecked by governments or laws. They carry guns.

By the end of the day, whale meat fills the hold and the men are tired. Methodically they go about the business of washing off blood and chunks of carcass, scrubbing out the stubborn spots of butchery. On the horizon a ship is seen approaching. All work stops as the intruder seems to bear down on them. A moment later the Sierra's captain recognizes the ship and frantically orders a change of course and an increase in speed.

It is from the police that the whaling ship runs, not from a naval vessel or Coast Guard cutter but from a new breed of environmental activist who has made a solemn vow to stop pirate whaling by any and all means.

Victory came for these ecologists on July 16, 1979, off the coast of Portugal, when Paul Watson and his crew aboard the 789-ton Sea Shepherd rammed the Sierra and put the whaling vessel out of commission. Sometimes it takes outlaws to stop outlaws. Watson recalls, "I am at war. This was not a subversive operation. We told those guys we'd sink them if they didn't stop.

"Watson, twenty-nine, a Canadian, curly-haired, and friendly when not swashbuckling, has no sympathy for the welfare of people on board pirate whaling ships. A career ecological activist, he was one of the founders of Greenpeace, though he is no longer affiliated with that group because of his radical stance. He credits his love for animals to childhood membership in a Kindness Club, a Canadian organization that teaches youngsters to respect animals. "I got the impression that instead of going out to shoot birds, I should go out and shoot the kids who shoot the birds," Watson says.

Twenty years later he continues to pursue his childhood ideal. His battle lines are drawn somewhere short of shooting but somewhere far beyond the law. At one time six pirate whalers roamed the Atlantic. Now through the efforts of Watson and others, there are none.

Watson placed $25,000 reward offers in newspapers for the sinking of whaling vessels and two South African whalers decided to pursue other interests. Two ships of the Spanish whaling fleet were blown up while docked at the port of Mann. Insurance contracts have been canceled on other pirate whalers as a result of the Sierra ramming incident.

"It's not something to be proud of," says Watson, recalling the incident, "just something that has to be done.

The most radical of ecological activists, Watson is not alone. The product of frustration and defeat political ears, ecological activism as a movement seems to be on the rise worldwide. Watson claims a loose international network of like-minded "agents." In England groups such as the Hunt Saboteurs try to disrupt fox hunts and the hunting of other animals; and members of the quite illegal and underground Animal Liberation Front break into laboratories to release test animals, disrupt fur shows, and pour liquid steel into fur store locks.

"England led America into ecological activism," claims Mike Martin, coeditor of The Beast, a British publication dedicated to increasing activism. Subtitled The Magazine That Bites Back, it covers the gamut of animal issues, including such topics as animal liberation, factory farming, and vivisection. In just a year and a half the readership has grown from several hundred to 20,000.

"We are the magazine of the movement," Martin says, "and from what I can tell what has happened in the movement in the past is tame compared to what is going to happen next."

The democratic way of doing things.
Unclean! Unclean! Our minds fairly scream it at the faintest whiff of body odor. This is one of our oldest and strongest prejudices. Today's biochemists can analyze with modern precision the bacterial fatty acids that cause our annoyance but our attitudes have changed little since the days when our naked ancestors carried bouquets of flowers to protect their delicate nostrils whenever they moved among the poor.

This may be quite unfortunate. We spend ever-increasing amounts on deodorants, antiperspirants, and scented cosmetic products for every inch of our anatomy and we dose ourselves with potent chemicals from head to toe. We do this even though we know nothing about the consequences of our actions.

Now Professor Sydney Selwyn at Westminster Medical School in London has given us a glimpse of the teeming microbial life that populates our bodies and creates our odors. He has found that too much concern for our cleanliness may be as great a health hazard as too little.

Contrary to previous reports, Selwyn has shown that we are crawling with bacteria. Every square centimeter of the scalp carries more than a million of them, and even the forearm—the least populated area—is covered with 11,000 per square centimeter.

Another of Selwyn's discoveries is that staphylococci, the germs that cause boils and similar infections, grow in only a few locations on the human body. The vast majority of skin microbes are resident commensals. Not only are they harmless, but they even protect us from disease-causing bacteria. That is why we should not be too eager to rid the body of its natural fauna.

There are several bits of evidence that prove the benefits of skin bacteria. One is what happens after a chemical overkill when people use too much deodorant. The normal residents die off, and foreign bacteria that normally die on the skin colonize it avidly.

Another comes from the study of babies. At birth, their skin is virtually sterile and can be colonized by disease-causing microbes more easily than at any other period of their life. Commensals eventually arrive to protect infants. But when they are inoculated artificially with normal skin bacteria, babies can immediately resist a wide range of infections.

How does this happen? Probably through population pressure. Normal microbial inhabitants are well adapted to life on the skin, and so they can usually crowd out any strangers.

This probably works just like any other population of plants or animals. When a foreign exotic species is introduced into a long-standing self-adjusting ecosystem, it can have a very difficult time trying to establish itself in the face of competition from the resident organisms. So even a highly virulent skin bacterium or fungus may stand little chance on a healthily infected face, foot, or groin. And minor pathogens don't even make it to first base.

Skin commensals also release fatty acids that destroy Candida and other disease-causing fungi. Accumulating in unwashed regions, these are the source of offensive odors. But in smaller, more natural concentrations, they provide a powerful defense.

Certain skin bacteria also manufacture antibiotics, which destroy invading microorganisms. Selwyn's research indicates that about 20 percent of healthy people harbor skin bacteria that make antibiotics. These bacteria are particularly effective against the germs that cause such diseases as scabies.

The researchers at Westminster are now trying to use these benevolent bacteria, or their antibiotics, to combat skin infections. The idea is particularly exciting because these antibiotics are effective against disease-causing microbes that resist commonly used drugs. They also kill off a greater variety of dangerous invaders than the antibiotics in general use. This work looks very promising. One fatty acid synthesized by skin commensals is now being used to treat athlete's foot.

Until these drugs become available we should probably cherish our bodily inhabitants. Go easy with the spray.
Within 25 years we could receive most—and possibly all—of our electricity from a necklace of man-made stars in the sky.

Solar-power satellites (SPS) promise to meet the electric needs of the next century. Yet a few voices are already urging us to ignore this potentially enormous resource.

One problem is money. To harvest this power requires a huge investment. And considerable manpower. We must build two five-gigawatt SPS units per year starting in 1990.

Challenging as this is, it can surely be accomplished. And it can be done safely.

The Department of Energy has studied the SPS carefully and worked hard to forecast its environmental and social effects (Contrast this objective study with the biased reporting that currently plagues nuclear power).

So far these evaluations have been generally favorable. It seems the SPS could solve our energy problems without creating health hazards or social ills. You can find out for yourself. Send for the references cited at the end of this piece.

But first let's look at a few of the most common fears that could delay SPS development.

An SPS might send back its power in the form of a beam of microwaves. For many people, microwaves mean ovens. Anyone blundering into the beam would be cooked in seconds. Wouldn't he?

Well, no. The total energy is enormous but spread over almost 100 square kilometers. At its center, the planned power density is only 23 milliwatts per square centimeter. This is less than one fourth the continuous exposure allowed by federal job-safety regulations.

Then, again, we might use lasers to send SPS power to Earth. And surely lasers are dangerous? After all, we've all seen pictures of lasers striking through several inches of steel.

Again, it's a question of power density. An SPS laser beam need not be any more powerful than the microwave beam. About a fourth as strong as the desert sun. We would not even see its infrared light.

When it comes to the SPS—or for that matter almost any other technical subject—some people simply have not done their homework. Given the price of hand calculators—even specialized scientific models now cost less than $30—this is shocking. The arithmetic needed is simple. Anyone running scared of technology does so out of ignorance and laziness.

Someone recently wrote a letter to Omni warning that the SPS would cause terrible environmental damage on Earth because the power satellites would block out the sun. If you can picture the vastness of space, this is obviously ridiculous. But let's look at the numbers, just to show how easily we can answer this kind of question.

The basic facts are available in most astronomy books. Our letter writer has no excuse.

The DOE/NASA Baseline SPS design would use an array of solar batteries ten kilometers long and five wide—an area of 50 square kilometers. (The figure has appeared in most major newspapers and many magazines.)

Geosynchronous orbit (GSO), in which a satellite orbits the earth in exactly 24 hours—thus staying above one spot on the ground—is 35,890 kilometers up. The circumference of the GSO is the amount of room available for an SPS system.

So add 35,890 plus half the diameter of the earth (look it up) to get the GSO's radius. Multiply by 2 for the diameter and then by \( \pi \times 3.14159 \) (the first six digits is plenty) to get the answer. It amounts to 265,515 kilometers.

Let's ring the planet with SPS units. It would take centuries, but think big. We'll allow 15 kilometers for each, leaving them five kilometers apart. Divide the total space available by 15, and it turns out there's room for 17,700 SPS units in GSO. The total area of the SPS system—assuming each unit takes up 50 square kilometers—is 885,000 square kilometers.

However not all of these SPS units will be between Earth and the sun at one time—only those in a 12.827-kilometer segment of GSO amounting roughly to the diameter of the earth. Draw a sketch of the planet and see for yourself.

CONTINUED ON PAGE 111
HYPNOTIC WITNESSES

By R. Bruce McCollum

Last July the nude body of violinist Helen Mintiks was found sprawled at the bottom of a Metropolitan Opera House skylight in New York.

The young musician had been forced to the roof by her killer, a man known to police as the Phantom of the Opera. The last person to see Helen Mintiks alive was a young ballerina, who gave police a vague description of a man wearing construction clothes and following the violinist into the elevator. Under hypnosis, however, the ballerina recalled the suspect as "blow-away hair, beard, and other details." This enabled a police artist to draw a composite sketch, which led to an arrest.

Despite the fact that no precise scientific definition of hypnosis has ever been possible and no objective criteria have been developed to identify just what a hypnotic state is, the technique has gained wide credibility as a criminal-investigation tool. Law-enforcement officials envision the day when every police department will employ at least one hypnotist, as a "brain bugger" to skeptics.

Discovered in the late eighteenth century by Franz Anton Mesmer, the phenomenon, originally dubbed "animal magnetism," became an early tool of Sigmund Freud and a popular parlor game. More recently, hypnosis has skirted the line between science and show business, touted widely as a curative method for smokers and compulsive eaters.

To proponents, hypnosis is an altered state of consciousness marked by accelerated recall, enhanced concentration, and hypnotic susceptibility. In the hypnotic state, the individual can have rapport with the hypnotist while being intensively involved with a facet of his own mind. An estimated 70 percent of the population, supporters say, can be hypnotized to some degree.

Doubters, however, claim that hypnosis is nothing more than concentrated concentration, not a different state of any kind. They believe similar results might be achieved without the numbing jumbo about trances, through conscious ego building and memory-spurring routines.

In spite of the controversy, hypnosis has been used as an investigative tool since 1959. It wasn't until the late 1970s, however, that big police departments, such as those of New York and Los Angeles, adopted it as standard procedure in solving tough cases. The Los Angeles Police Department, a pioneer in the technique, has 12 staff hypnotists and the New York Police Department has one full-time hypnotist who handles about five cases a week and another eight officers who are qualified to hypnotize.

The FBI, after a successful two-year pilot study by its Behavioral Science Unit at Quantico, Virginia, adopted hypnosis in 1976 for use in select cases. The bureau's full acceptance of investigative hypnosis came with the year's famous Chowchilla kidnapping case, in which a busload of California school children were abducted and held captive in a camouflaged ditch.

After escaping, neither the children nor their bus driver could remember anything about the abductors. However, under hypnosis, bus driver Ed Ray remembered the license-plate number of the kidnappers' van, resulting in their arrest.

Since then, the FBI has used hypnosis in more than 50 cases, including last fall's Vegas shooting.

Scientists have devised tests that identify the best potential hypnotic witnesses. For instance, in 1975 at a Veterans Administration hospital in Ann Arbor, Michigan, there was a series of deaths caused by the injection of Pavulon, a curare-type substance, into patients intravenous tubes. The FBI administered susceptibility tests to hundreds of potential witnesses and culled them down to a dozen. Through hypnographic interviews with this group, the FBI was able to build a case against two Filipino nurses.

The most common investigative use of hypnosis is to elicit evidence from eyewitnesses and victims by simply refreshing their memory. According to Charles Diggitt, of the Babylon Hypnosis Center, in New York, founder of the hypnosis program of the New York Police Department, only 5 percent of hypnotized witnesses or victims yield no new evidence. Law-enforcement officials assert that hypnotic interviews provide new information between 45 and 65 percent of the time. But critics of hypnosis charge that inaccurate information also increases by the same percentages.

The FBI study revealed that hypnosis increased recall 80 percent of the time.

The predominant method of conducting a hypnotic interview is the television technique. The witness is asked to imagine himself or herself at home, watching a favorite TV program. In this hallucinatory environment, the witness feels the witness is spared the trauma of re-creation, and anxiety that often accompany reconstruction of a violent crime. After the hallucinatory TV program ends, the witness is told that a documentary will follow and that it will depict the events of the crime as the witness saw them. The event is then re-created by using similar film techniques as slow motion, freeze frame, and instant replay. Where descriptions were fuzzy in the original testimony, the camera zooms in on the scene, enabling the witness to recall details of his or her experience.

CONTINUED ON PAGE 121
Evil is not a common presence on the science-fiction film landscape. There are antagonists of course, but they rarely realize their full potential for wickedness. Most are merely lunatics, like the computer HAL in 2001: A Space Odyssey, or lethal, like the bacterial organism in The Andromeda Strain, or at worst, ruthlessly megalomaniacal, like Darth Vader or the adversaries of Agent 007. Blood-chilling evil is scarce, and for filmgoers who enjoy it, seldom has a screen villain been realized with more style or a greater sense of omnipotence than Emperor Ming of Mongo, the satanic nemesis of Flash Gordon.

Conversely, few performers have spent as much screen time battling evil as has Max von Sydow. As the protagonist of Ingmar Bergman’s classic fantasy The Seventh Seal, he distracts Death by engaging him in a game of chess. As Jesus in The Greatest Story Ever Told, he is tempted by the Devil. And as the aging priest of The Exorcist, he helps free a young girl from the demon that has taken possession of her.

“Now I am Ming,” the actor declares, “and not just Ming, but Emperor Ming the Merciless. He’s the villain of villains, conqueror of the universe, a mixture of Mephistopheles and Rasputin.”

No one could be more unlike the wicked potentates than Von Sydow. The son of a professor of comparative folklore, the Swedish-born actor is a thoughtful and dignified man who speaks five languages in a lifelike voice and has what one critic called “the most constantly evocative face in film.” An alumnus of the distinguished Royal Dramatic Theater School in Stockholm, Von Sydow attracted international attention when he started his long association with Bergman. Among the dozen acclaimed motion pictures they made together are Wild Strawberries, The Virgin Spring, and Through a Glass Darkly. Von Sydow now resides in Rome, though he has spent much time in the United States for roles in such films as Hawaii and Three Days of the Condor.

Clearly, Flash Gordon is a departure for Von Sydow. It’s a fun picture, as two-dimensional as a comic strip should be. Ordinarily, I look for roles that deal with interesting human qualities. Though Ming has little of those, it is a more entertaining and spectacular part than any I’ve done before. Seldom does a character who is good carry drama as well as one who is evil. While I’m not anxious to play any other supervillains, it is important for an actor to pursue that kind of variation and always try to do something different from what he’s done before.” Von Sydow adds that, if nothing else, Ming was one of the most physically demanding roles he’s played. His head was shaved, and throughout most of the picture he labored under costumes that weighed as much as 60 pounds. A lot of the wardrobe was covered with glass beads, which had to have very stiff support. Waiting between shots was difficult, because I really couldn’t sit down. Those folding chairs were just too small to accommodate Ming’s regalia. Luckily I forgot my discomfort in front of the cameras, because the ornate costumes worked so well theatrically.”

Ming is not a character who calls for significant philosophical study. As conjured by Von Sydow he struts and paces with such flamboyance that while his evil deeds are extreme, he is at times virtually a caricature of evil. “These flouts remind us that he is, after all, not real.” That’s an important consideration, the actor insists, in a culture where the popularity of cinematic villains rivals that of the heroes. “I suppose it’s odd on the surface that audiences side with the adversary rather than with the one fighting for mankind. But the fact is that villains serve a therapeutic function. Through them we get rid of some of our own aggressions. Ming, for example, has a power we envy a bit. That’s an acceptable allure, one that we needn’t resist, because we know that sooner or later Ming will perish, dragging behind him our wayward flirtation with evil.”

Von Sydow is the first to grant however that despite this catharsis there is a danger in our ready acceptance of screen villainy—especially when the films are more serious and real than Flash Gordon.

Continued on page 120.
All those years,
all those miles,
all those stories,
all those songs,
all those sights,
all those sounds,
all those dreams...

all those sons,
one of them
is going to be a star.
He is America.

He is the son of its heroes and its villains, its soldiers and its lovers, its builders and its dreamers.

They lived for him and died for him and everything they did, they did to music.

This is his story. These are his songs.

It's an epic journey down through the music of American time through the eyes and spectacular moving art of Ralph Bakshi, the creator of "Fritz the Cat," "Heavy Traffic" and "The Lord of the Rings."

It's the ultimate sight and sound experience with the mind-blowing music of Bob Seger, Jim Morrison, Jimi Hendrix, Janis Joplin and many other great American artists.

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A MARTIN RANSOHOFF PRODUCTION
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The State of the Art in Living Animation.
SPACE ENCOUNTERS

UFO UPDATE

By James Oberg

Scarcely a UFO book, movie or magazine appears today without making some passing reference to the incredible notion that "our astronauts have seen UFOs." This is perhaps so because some of the most exciting, most intriguing UFO stories or record are based on reports made by astronauts. The new McGraw-Hill UFOs: A Pictorial History offers a double-page spread of a UFO photo taken from Apollo 11. Johannes von Buttlar's UFO Phenomenon, last year's best seller in Germany and now in an English language edition has a giant foldout of a Gemini 7 twin UFO. Maurice Chatelain's Our Ancestors Came from Outer Space, which contained a chapter devoted entirely to UFOs seen in space, was a popular success in France and is now an English language paperback. Speeches made by UFO buffs in the USFR provided material for UFO enthusiasts in the National Enquirer late in 1979, but the same stories were subsequently denounced by Pravda as 'sensationalist inventions'—virtually a testimonial to their authenticity, considering the spokesman. That same week ufologist Bob Barry was telling a convention near Cape Canaveral that the secret UFOs following our astronauts were really angels. A cult in California insists that they were merely alien inhabitants from another plane of existence who offered to help save the crippled Apollo 13 moonship.

These and other tales have been passed from one author to another over the years, growing in strangeness with each retelling. However few UFO enthusiasts if any, have made the slightest attempt to substantiate or repudiate them.

And that is a pity because careful examination of the original records does suggest that astronauts have seen many things they did not expect and could not identify. The most famous of these encounters involved Gemini 4 pilot James McDivitt in 1965, but there were other notable cases associated with Gemini 7, Gemini 11, Apollo 12, and Skylab 3. A complete search of the UFO literature turns up dozens of additional reports. The question is: How many (if any) are true unidentified flying objects?

The central issue confronting UFO investigators is whether these sightings were fundamentally different from what might ordinarily be expected on "routine astronaut missions." It has been shown that visual stimuli associated with manned spaceflights, such as discarded pieces of the spacecraft, flickering fragments of insulation or ice, cabin debris, nearby satellites, reflections and glare, and film faults, are responsible for a large proportion of the UFO reports attributed to astronauts. Widely publicized UFO photos from Gemini 12 and Apollo 10, for example, merely show cabin debris drifting out of an open hatch, or ice chipping off a rocket thruster. A "saucer" allegedly photographed on Mercury 7, turned out to be only a visual-tracking balloon ejected from the capsule. The infamous "snowman UFO" of Apollo 11 was merely a movie test sequence that happened to include prominent window reflections (the story was embellished by a hoaxed voice transcript and by some artful photographic retouching).

But McDivitt's UFO story seems to be different. The praying former astronaut and retired Air Force general is now an executive of a Chicago firm. His manner is sober, straightforward, and low-keyed, belying the sensational implications of his airborne encounter.

During the second day of the four-day flight (June 3-7, 1965), while his coolant was asleep, McDivitt chanced to glance out of his window. Suddenly he caught sight of a "beer-can-shaped object" drifting nearby (he has never specified how large it seemed, or whether it was tumbling). Surprised, he got a camera and took several pictures. Then he reached for the ship's controls, fearing a collision. He lost sight of the object in the glare of the sun and couldn't find it again.

McDivitt remained singularly unperturbed by the sighting. Even now he maintains that it was probably only a booster rocket from some other man-made satellite. Although McDivitt was willing to talk freely about it: there is no record that he ever filed a formal report with NASA or with the Air Force's Project Blue Book UFO study.

Whatever it was, the object caused some puzzlement at Mission Control in Houston. The Air Force satellite tracking center in Colorado reported that no other satellites were nearby. Puzzled officials soon had other problems with which to contend, however since the space race was then at its height.

The excitement returned when a NASA audiovisual technician in Washington D.C. released what he thought must have been the photographs McDivitt took. Several frames of movie film showed a blip of light with a tadpolelike tail. When McDivitt checked the flight film, he concluded that the UFO image was so many others had not developed clearly. He asserted that the image in the "tadpole UFO" photo did not resemble the object he had seen but was rather a test exposure showing sunlight reflecting off the edge of a cabin window.

Despite McDivitt's disavowal of it, the picture appeared in dozens of UFO
GOOD NEWS FOR VIKING

In 1976 two representatives of Earth sauntered across interplanetary space, plopping themselves down on the reddish-gray and distant terrain of Mars. Viking Landers 1 and 2, sitting beneath a pinkish sky, sniffed the thin Martian air, listened for the rumbles of Marsquakes, and eyed the surrounding estate, while testing the planet's soil for traces of life.

Aided by a duo of Mars-circling parent vehicles called Orbiters, the Viking missions were a $1 billion expression of scientific curiosity. For month after month, Mars was alive with the electronic senses of robotic brethren. But as if to mimic their earthly human counterparts, old age has taken its toll on the Viking spacecraft. One Lander and the two Orbiters have now fallen silent, although functioning beyond intended lifetimes. Remaining on an extended tour of duty is the still-kicking Viking Lander 1.

This lone survivor transmits weekly bursts of weather engineering, and photographic messages directly to home planet Earth. It is conceivable that the digital umbilical cord of data between the third and fourth planets from the sun will be buzzing until 1980 and perhaps beyond. The cost of preserving the link? Upwards of $200,000 each year, necessary to track, process, and analyze the signals. In astronomical outlay the figure is a pittance. Yet there is no assured protection from the frugal eye of a governmental budget cutter.

To bolster the chances of maintaining an Earth-Mars dialogue a do-it-yourself swap space program has been created. Coming to a promotional rescue is the Viking Fund, which was established as a project of the San Francisco section of the American Astronautical Society and introduced to the public last year (see First Word, May 1980). A cadre of 20 to 30 volunteers answer the fund's phones and the flood of mail.

"We're working night and day just to keep up with the business of answering all mail inquiries and handling publicity and promotion," states Stan Kent, chairman of the fund. Nearly 100 letters a day pour into the fund's office, yielding an average contribution of $10. The response is not just an American phenomenon. Donations from Australia, Canada, Egypt, Japan, and the Netherlands are not uncommon. Though individual gifts account for the bulk of the money received, many activists have organized Viking fund-raising events centered around their areas of interest.

One drama group in Florida staged Ray Bradbury's The Martian Chronicles, offering to donate profits from the show to the fund. An Oregon L5 Society group contributed $100, a product of a used-textbook sale. Star trek fans in Seattle raised $63 from selling cakes. Astronomy clubs across the nation have been a strong contingency of the fund's outreach.

One computer company donated equipment to aid in listing the fund's contributors and mounting finances; while a business near New Orleans, propitiously called Martian Metals, is donating part of its profits on a yearly basis. Although financial support for Viking is the driving motivation behind the fund, the letters attached to contributions can only stir the soul.

A student in Florida:
"Enclosed is a $15 contribution. Believe me, the space program is worth more to me, but I can't even afford to afford it. I am currently unemployed and heading back to college shortly."

An artist in California:
"Here's my $5. Perhaps we needn't worry about the future if we can survive."

A young student in Texas:
"I can only afford $1. I am only 12. But perhaps the Viking Fund can at least show the American government how much we care."

Good luck.

A professor in Nebraska:
"My donation is about the cost of theater admission to such films as Star Wars, 2001, Silent Running, etc. I feel that if everyone would make a contribution instead of seeing such films repeatedly, it would do a great deal to make science fiction science fact."

To date the Viking Fund has received $100,000. A good start, but more is needed. "I'm firmly convinced the Viking Fund is a project the world has been waiting for," Kent explains. "People have fudged too deeply into the space program for too long. Something I don't think the government has really understood. Even though people have bills mounting up, they think space exploration is important enough to pay for it themselves."

Those space enthusiasts interested in the fund who wish to send tax-deductible contributions (the minimum amount is $1) should write to The Viking Fund, P.O. Box 7655, Menlo Park, CA 94025—LEONARD DAVID
HORNEED WONDER

It has the pedigree of a camel, the body of a moose and a nose like a slingshot. For lack of a better name, Dr. David Webb, curator of paleontology at the Florida State Museum and professor of zoology at the University of Florida, has called it the Horned Wonder.

The Wonder is a distant relative of the camel that roamed the tropical forests of Florida until its extinction about 5 million years ago. Paleontologists were unaware the animal existed until 1979 when a fossil hunter named Frank Garcia found part of a skull of one of these creatures and took it to the museum.

As animal skulls go, it's a pretty strange find. Most significant, the head has two pairs of horns, one set about 20 inches long, curved forward and down from the top of the head, and the other set, only about 6 inches long, curved out in a crude U or slingshot shape near the nose.

Webb says the creature was part of an unknown evolutionary line of Protoceratidae, horned mammals related to camels that wandered over North America 5 million to 40 million years ago. Physically he estimates the animal was roughly the size and shape of an average moose, about five feet high at the shoulder and roughly three quarters of a ton in weight. In Webb's words: "It was a great, long legged beast with an extraordinarily powerful neck."

The Wonder is just another

FLAT HOT DOGS

Almost a third of all childhood choking deaths are caused by food and half of the food deaths are caused by hot dogs, a study at the Johns Hopkins University School of Hygiene and Public Health has discovered.

Why? "A bite-sized piece of hot dog is the right size and of a roundness to form a perfect plug over the airway causing suffocation," says epidemiologist Susan P. Baker who collaborated on the study. One possible remedy: flat hot dogs.

The hot-dog finding stemmed from a review of a few dozen child choking deaths in Maryland over the past ten years. Choking is the leading cause of death in children under one year old and fourth in children aged one to four.

About 20 percent choked on wooden balls, rattles, balloons, and pacifiers. Half suffocated in miscellaneous ways such as being trapped in an abandoned refrigerator or being accidentally strangled by a cord in a crib.

The remainder choked on food. The non-hot dog half included gum drops, cashew nuts, potatoes, and hamburgers. Baker said she sees no reason to believe the Maryland choking percentages are atypical; she added that many of the deaths could have been prevented by better design. For example, the government could require balloons to have four-centimeter rings inside, making swallowing them more difficult.

Flat hot dogs did appear briefly in the 1940s, but they didn't catch on. Their design lets air flow on each side of a piece lodged in an air passage. A spokesman for the National Hot Dog and Sausage Council said, "We haven't heard of anyone who's seriously considering flat hot dogs." Pending such a redesign, Baker suggested that hot dogs be cut in strips before being fed to young children.

- Stuart Diamond

"A protective-reaction strike means never having to say you're sorry."

- Anonymous

I believe that a solar eclipse is a beautiful and rare experience, while an eclipse of the moon is a cheap and common spectacle.

- Steve Martin

A hot dog is the right size and shape to form a perfect plug.
CHORUS GIRL HYPOTHESIS

While animal behaviorist Wayne C. Potts was a military pilot, he observed that when the leader of a squadron made an abrupt maneuver, the last planes could not duplicate it quickly enough to stay in formation. Yet large flocks of birds make 90-degree turns so fast they seem to move in unison. How do they do it?

There has been much speculation on the subject. In fact, entire books have been written on so-called thought transference in birds while other researchers have given birds credit for a sixth sense linked to electromagnetism.

Nonsense, says Potts now at the University of Washington. "Birds turn quickly because of the chorus girl hypothesis."

Potts filmed flocks of dunlins, a shorebird, while shooting arrows near them to make them turn abruptly. After two years, just as he was about to run out of film, he discovered the birds' secret. First, they do not turn in unison, it only looks that way. It takes an average of 13 milliseconds per bird for a maneuver to be propagated through a flock. Yet in the laboratory dunlins take much longer—38.3 milliseconds—to respond to a visual stimulus.

Potts examined his film frame by frame and found the crucial evidence. Birds near the lead bird take much longer to make the turn than birds farther away.

What this means, Potts says is that birds adjacent to the initiator of a turn see the actual movement and respond to it, but birds farther away see a kind of wave approaching them. They anticipate the arrival of the wave by moving before they see their neighbor move. The same phenomenon, he says, operates in chorus lines. During a high-school show, he measured the propagation of a wave of movement from girl to girl and found it was twice as fast as human perception—hence, the name for his hypothesis.

—Barbara Ford

BRAIN GLUE

With a steady hand and a little super glue, one University of Texas physician is repairing damaged or malformed blood vessels in the brain and saving his patients from brain damage and even death. Neurosurgeon Dr. Duke Samson, in an experimental procedure that he devised, uses a surgical variant of the quick-acting super glues to form artificial blood clots and correct two kinds of brain disorders.

The first is called arteriovenous malformation (AVM). Instead of narrowing down to capillary networks and then reexpanding to veins, the brain artery, as an inherent defect, flows directly into veins draining blood from other parts of the brain. Left untreated, AVM can cause blinding headaches, stroke, or even death.

Another problem is called carotid cavernous fistula. The carotid artery, one of the brain's two main blood passages, is partly enclosed inside a vein. If it is severed, arterial blood may leak into the vein and starve the brain of necessary nourishment.

When no other method will work, Dr. Samson takes the drastic step of cutting open the skull and, using a syringe, injecting minute amounts of a special glue that quickly sets in reaction to the ions in blood. "In the AVM operation, for example, Samson explains, the glue expands like a sponge, and in the expansion a clot forms." By carefully placing the glue-induced clots, he can reroute the flow of blood and save the rest of the brain.

—Douglas Coligan

Dr. Duke Samson and team performing brain surgery. A tiny bit of super glue brings relief even longer life to some patients.
NEARING DEATH

Knowing about people who have had near-death visions or other experiences is no guarantee you will have one yourself. In fact, according to a University of Connecticut psychologist who has completed an extensive study on the subject, just the opposite seems to be true.

Dr. Kenneth Ring and his associates made their discovery after interviewing 102 persons who had come close to death through illness, accident, or in some cases, attempted suicide. He did find that almost half, 48 percent, had what he calls a "core experience" a sense of deep peace, a reevaluation of their lives, a vision of unearthly lights, or even a confrontation with spirits. Among the men, he found that accident victims were most likely to have had these experiences. Women had their core experiences through illnesses.

Attemted suicides had few of these experiences and, curiously enough, the same was true of those who held religious beliefs in an afterlife or who had previously known of the near-death phenomenon.

Most of those who had the experience had no such religious beliefs and had never heard of Elisabeth Kubler-Ross, the foremost researcher of near-death visions.

That ruled out what Ring designates the "wishful thinking" theory, that those

BREATHING FACTS

Though few occurrences are more common, human breathing has not been a hot topic of scientific study. But a two-year effort at Brookhaven National Laboratory has disclosed some curious conclusions about breathing and pollution.

The study found that along with the six liters of air the average adult breathes each minute, a wide variety of particles are inhaled and these particles remain in the lungs for varying amounts of time. The longer the particles remain, it is theorized, the greater the chance of health problems.

The scientists found that about two thirds of the particles come out within a few hours. Many are caught by the cilia in the airways and are swept out as mucus. The remaining particles enter the lungs and are gradually removed from the body in two phases: after 30 days or after 300 days.

Physicist Daryl Bohnen and his associates discovered that most of the smokers in the study had no 30-day phase. Pollutants remained in their lungs for a year or longer.

Moreover the longer a person smokes, the longer particles will stay in the lungs. For example, someone smoking a pack a day for 20 years retains pollutants in the lungs for two years. The study discovered that pollutants tagged with a trace amount of radiation far below health standards. The particles

"The truth is that those who have never entered upon scientific pursuits know not a tithe of the poetry by which they are surrounded."

— Herbert Spencer

"Space is the empty place next to the full place where we live. I believe we will be true to our nature and go there."

— James R. Arnold

"[Crash programs] fail because they are based on the theory that with nine women pregnant, you can get a baby a month."

— Werner von Braun
IMPACT SOFTENER

It is now possible for a football player who comes crashing down on his head elbows or knees to pick himself up and return to the line of scrimmage without feeling more than jostled, if he is wearing protective padding made of Sorbothane. This new polyurethane elastomer can reportedly absorb up to 35 percent of impact energy. To dramatize just how absorbent it is, the British inventor places an egg in a Sorbothane mold, then hammers away with a mighty blow. The egg doesn't break.

Sorbothane is a plastic human flesh. It is self-extinguishing if exposed to flames and will heal if it is cut. Its fleshlike appearance and absorption properties have drawn the interest of medical researchers who are experimenting with its use in surgical implants, artificial limbs, and postmastectomy breast prostheses. But the greatest flurry of medical interest concerns its use for minimizing the shock waves of head strike. Setting heels down on hard ground can produce an impact of five gravities, normal walking can thus spell cumulative agony and the annual loss of 20 million working days each year for people suffering from backaches, arthritis and migraine headaches. A simple Sorbothane heel insert for absorbing this impact can bring relief.

Sorbothane is finding wide use in industry too. It makes an excellent retaining seal for the front cab windows of high speed trains and can reduce the vibration of ventilators and air conditioners installed in roofs. It can be used to seal gas, electricity and telephone ducts and as damping supports for computer floors. Since it also absorbs acoustic energy, it is a welcome addition to hi-fi technology to be used to isolate the counterbalance in the pickup arm and as a turntable pad. And a submarine lined with Sorbothane would theoretically be rendered acoustically invisible so that it could escape sonar detection.

—Walt F. Leff

"The simplest schoolboy is now familiar with truths for which Archimedes would have sacrificed his life.

—Ernest Renan

"Science is always simple and always profound. It is only the half truths that are dangerous." —George Bernard Shaw

LITTER ANALYSIS

What's in litter these days? At Yosemite National Park in California, the 1979 campsite litter included six human skeletons, 487 pairs of glasses, 16 toupees, two plastic statues of Jesus, 22 cameras, 41 sleeping bags, one bathtub, two church pews (with cushions), 4,028 lipstick dispensers and more than 10,000 combs.

If this sounds impressive, it doesn't compare to the volume and variety of litter found on the nation's roadsides. A study for Keep America Beautiful finds that on highways in 29 states more than 1,000 items—sometimes more than 3,000 items—are discarded every mile of road. It's a veritable department store. More than 200 different types of litter were identified in addition to the usual paper, bottles, cans and plastic.

The discarded items included tool boxes, venetian blinds, coat hangers, fishing poles, cupboard doors, photographs, dentures, shirts, gloves, pocketbooks, stock rings, slips, hair nets, shoes, cribs, linoleum, diapers, spoons, knives, forks, plates packages of meat, air mattresses, bowling pins, television sets, phonographs, records, rugs, horseshoes and dead animals—hats, foxes, porcupines, dogs, cats, pheasants, ducks, and rabbits.

Studies have found that April leads all other months for littering. In June the least amount of debris is jettisoned. People under twenty litter more than those over twenty

Litter proliferates where litter already exists and where people feel no sense of ownership. Researchers have determined that littering regenerates where litter already exists and where people feel no sense of ownership.

—Stuart Diamond

"I don't believe in the generation gap. I believe in regeneration gaps. Each day you regenerate or else you're not living.

—Duke Ellington
BAD NEWS FOR BLACK HOLES

Black holes, those favorite playthings of theoretical astrophysicists and science fiction writers, may not exist after all, according to Frank J. Tipler, a theoretical physicist at the University of Texas, in Austin. He bases his conclusion on refinements in earlier calculations that showed the material could leak out of black holes.

A black hole is an object that has collapsed upon itself to a density so high that, to a first approximation, not even light can escape from it. However in 1974, Stephen Hawking of Cambridge University in England showed that black holes would evaporate gradually. This evaporation is due to quantum-mechanical effects causing energy from inside the black hole to go to form particles just outside its edge, or "event horizon."

By considering factors Hawking had not taken into account, Tipler came up with dramatically different results. While Hawking's theory predicts a black hole with the mass of the sun would need more than 10^{73} years to evaporate, Tipler's theory predicts it would take less than one second.

One possibility, Tipler says, is that rapid particle generation would cause potential black holes to evaporate before they could form.

Tipler's results remain controversial, and new calculations could rescue black holes. However some physicists might be happy if black holes were proved to be impossible. In theory, every black hole could harbor a singularity, a point where the laws of physics break down. - Jeff Hecht

ALUMINUM RISK

Aluminum, the abundant, lightweight metal does not appear to be as benign as has generally been believed. Research has recently shown that elevated levels in the body may lead to mental disorders such as poor memory and impaired bodily coordination.

"Large numbers of people in our aluminum-using society may be the victims of slow aluminum poisoning from several sources," Yale University Medical School physician Steven E. Levick wrote in the New England Journal of Medicine. A prime suspect is aluminum that has leached from worn out pots and pans, he writes.

Aluminum also enters the body in the form of aluminum salts, which are used in drinking-water treatment, in antacids, and in most baking powders. And aluminum is often used as an ingredient in underarm deodorants.

Other research has found higher-than-normal concentrations of aluminum in the brains of senile people. Dr. Carl C. Pfeiffer, director of the Brain Bio Center, a trace-mineral research laboratory in Princeton, New Jersey, says that elevated brain levels of aluminum have been associated with Alzheimer's disease, a progressive loss of brain function that mimics senility.

So far the scientific evidence on aluminum risks is inconclusive because of the many other factors that can contribute to mental problems. But researchers are increasingly becoming aware that the body is turning into a collecting place for a host of trace metals and chemicals that may upset a delicate biological balance. Scientists say the aluminum question calls for further study. - Stuart Diamond

Scraping an aluminum pan might be an unhealthy practice...

"All that exists is in a sense the seed of what will be born from it."

— Marcus Aurelius

Knowledge may give weight, but accomplishments give luster, and many more people see than weigh.

— Philip Dormer Stanhope

NATURAL GAS

Blame badina and, of course, beans says one doctor, for what is really more of a social than a medical problem, namely flatulence. Writing in the New England Journal of Medicine, Dr. Michael Levitt, a gastroenterologist with the Veterans Administration Medical Center in Minneapolis, suggests that recent discoveries...
about the problem may deflate some of the mythology surrounding this topic and pump some data into a field that has been filled largely with hot air.

For one thing, he points out, gases expelled by the body—hydrogen, methane, and carbon dioxide—are in themselves odorless. For another, the gases and the distinctive odors that go with them are produced not by the human body exactly but by bacteria that lurk primarily in the colon.

In people with problem flatulence, the bacteria produce excessive amounts of hydrogen, which comes from fermenting the sugars in carbohydrates such as beans.

Medically he notes, the odor thrown off by the bacteria could also be useful in a kind of breath-analyzing diagnosis. Metabolic shifts, such as certain liver conditions, affect how the bacteria function and even change the composition of the gases. This could explain why patients with certain liver problems have a distinctive halitosis.

Given this, Levitt whimsically suggests doctors could use specially trained bloodhounds to sniff out the ill in rare moments flatulence can even be mildly racy. There are recorded cases, Levitt says, of natural gas explosions during colon operations where electrical equipment was used. "A spark at an inopportune moment can result in a frightening blast," he warns. With the rise of interest in intestinal gas, he suggests, we could be witnessing the birth of a whole new subspecialty of medicine, flatology.

— Douglas Colligan

NEW YORK CAVIAR

New York State answered France with its own wines and champagnes. So now it seems appropriate that the I Love New York madness should usurp the ultimate status symbol caviar. The action of one of the world's oldest caviar producers has been experimenting with roe taken from sturgeon in the Hudson River. New York State's most famous waterway. Although deprived of its former majesty by pollution, the Hudson recently has become clean enough to yield edible fish and fish eggs.

"All the tests we've done show that the roe of the sturgeon is within the guidelines set by the U.S. Food and Drug Administration," said Arnold Hansen-Sturm, a fifth-generation caviar producer and now president of Hansen Caviar in Englewood, New Jersey. "Tests by New York State officials have found that levels of polychlorinated biphenyls called But the U.S. caviar industry declined shortly thereafter because of pollution and overfishing. Since then most caviar has come from the Soviet Union and Iran—and from domestic imitations such as salmon and whitefish. In 1974 Hansen-Sturm and others began reviving American caviar chiefly in the South and the Pacific Northwest. It sells for about $95 a pound—half the cost of its imported counterparts and a quarter the cost of the best Russian caviar beluga.

Hansen Sturm expects the reestablishment of Hudson caviar may occur within a few years. It tastes very good," he said.

— Stuart Diamond
CONTINUUM

DISCO DISC

A two pound black disc that was originally made to keep barnacles and mollusks off the hulls of ships may dramatically improve speech-therapy techniques for deaf and hard-of-hearing children—see how and where the tongue is placed.

The hearing impaired can also develop an appreciation for music by using the disc. If it is wired to a stereo system and attached to a floor, it can dance to the musical rhythms they feel under foot. As a result, the discs are popular in deaf education.

Several schools for the deaf are experimenting with the instrument, marketed as Disco Disc by Scientific Innovators International, of Aiken, South Carolina. In an eight-week study conducted this year at the South Carolina School for the Deaf and the Blind, preliminary data found the transducer "helpful" in speeding the process by which students mastered one syllable words.

Research on the disc is now going on at Brigham Young University and at the Wichita State University Department of Communicative Disorders and Sciences.

—Robert Brody

KILLER WAVE

What’s more than 100 feet tall, may lurk within the Bermuda Triangle, and is capable of sinking ships without a trace?

The newest culprit proposed for the mysterious Bermuda Triangle disappearances is, of all things, a killer wave.

In a sense, it’s the Perfect Wave, and it has turned up in a large computer-controlled wave flume at the hydraulics laboratory of Canada’s National Research Council.

Under certain conditions says Joe Ploeg, who heads the hydraulics laboratory, the sea bottom profile—tides, winds, and counter-currents—all interact so that the waves become sorted by their periods (speed) and catch up with one another.

The result? A single wave more than 100 feet high that breaks when it exceeds a critical steepness—with devastating results for any ship or breakwater at the breaking point.

These “episodic waves” used to be considered quite rare, according to Ploeg, since they are basically short-lived phenomena and any ship close enough to experience one was likely to be sunk without a trace because of the tremendous destructive power. However, the SEASAT satellite has recently been used to help pinpoint ocean areas and conditions that serve as breeding grounds.

Nobody knows whether episodic waves are at the heart of the Bermuda Triangle mystery. But a few triangles off the coast of Norway have been found to be such hotbeds of episodic wave activity that marine insurance companies will not cover for damage occurring inside those areas.

Still, the shroud of mystery has not yet been entirely pierced. Even though Ploeg can create episodic waves at will in his flume, nobody has been able to explain how they get so high and steep, seemingly defying gravity, before they finally break.
Subliminal persuasion is back as scientists research new ways to influence people without their knowing it.

IN THROUGH THE OUTDOOR

BY ERIC LANDER

Groceries aren't the only things they sell at one big New Orleans supermarket. They sell honesty. Not exactly self if they give it away. Hidden in the rear of the store is a small, black box that mixes into the supermarket's music a whispered message over and over again: "I am honest. I will not steal." It is so soft that it escapes most people's notice. Yet the store claims it works. Teen-aged check-out girls no longer skim a few bucks from their cash registers. Customers and employees used to pilfer $100,000 worth of food each year, but not anymore, thanks to subliminal perception.

A Swedish Air Force cadet stares at a picture flickering for 0.004 second. Though he can barely perceive the image, he must instantly interpret its meaning. What the cadet retains will reveal his potential as a pilot. If his subconscious fails to register he will be found unfit to fly. Sweden reckons it has saved a lot of kronor and a lot of lives by reducing the dropout rate of flight school.

PAINTING BY SALVADOR DALÍ
traneous. Other services may follow suit.

A movie theater in Southampton, England, shows films its audience cannot see. The viewers are aphorogical undergoing treatment for their fear of open spaces.

Certain students in Israeli math classes are induced to perform better on tests by being secretly shown ultrafast messages designed to make them feel good about themselves. These women lose weight at New York University by a similar manner.

How can anything be accomplished by whispering sweet nothings into people's ears or flashing them into their eyes? Businesses, governments, and scientists are attempting to open a direct communication channel with our subconscious by skirting the edge of consciousness. Their intent is to deliver subliminal messages so fast or so faint that they sneak in through the mind's back door.

By definition, the target of a subliminal message cannot give his or her consent. In the wrong hands, such technology could plant questionable suggestions and commands in the unsuspecting minds of others. Scientists for their part have never been able to agree about just how successful such manipulations might be. After a long hiatus, research has resumed into this highly controversial phenomenon.

DRINK KIM

Subliminal perception first came screaming into American consciousness in the mid-1950s when a Fort Lee, New Jersey, theater flashed the words drink COCA COLA over Kim Novak's alluring face during a six-week run of the film Picnic. The message was the branchchild of New York marketing researcher James Vicary who boasted that Coke sales in the lobby climbed 58 percent and popcorn sales rose 18 percent (Vicary never divulged the exact data).

No sooner was the secret leaked than a avalanche of criticism came crashing down on him and the psychologists whose research had inspired him. Congressmen called for investigations. The Women's Christian Temperance Union publicly feared for the nation's youth should brewers exploit the new technology. Everyone feared that political candidates might manipulate the airwaves. Expressing the country's indignation, the Saturday Review editorialized that subliminal techniques should be attached to the center of the next nuclear explosive (device) scheduled for testing.

Many psychologists were alarmed by what they perceived to be an assault on their professional ethics attacked subliminal research. They called for a moratorium on further experimentation. The naysayers fairly much got their way. Until recently the field was stigmatized. There was also some technical confusion over how to approach the complex workings of subliminal perception. Then too academic funding has left a bitter aftertaste. University of London Professor Norman F. Dixon, author of an upcoming book surveying the discipline, notes that an incredible amount of bigamy still plagues the field.

Hollywood is just one of many indicators of renewed interest in subliminal manipulation. The topic is central to the theme of the big-budget film Agency starring Robert Mitchum and Lee Majors. An advertising agency is hired by an unspecified evil power to subvert the United States. The ad exec embeds political commands in deodorant commercials and pervert children by including covert messages in pitches for chocolate milk. The plot is the stuff of 1950s nightmares. Unfortunately for the movie's creators, turning the population into zombies by subliminal subterfuge is the only thing scientists unanimously agree is out of the question. Researchers are trying to decide just what is possible.

A spate of recent neurological and psychological experiments has caused researchers to rethink 'attention theory' - the models of how the brain processes the vast amount of useful information and the distorting elements constantly flowing into it. Apparently the brain sorts the stimuli and selectively refutes important bits of information to the conscious mind for special attention. The rest it responds to subconsciously. "You may be aware of this presetting if you've ever been chatting at a noisy cocktail party and suddenly perked up at the mention of someone interesting name or word in a conversation across the room."

What about using subliminal commands to render someone a willing slave? Fortunately it can't be done. A subliminal message is a subtle instrument. For it to have any effect the individual must first be favorably disposed to thinking or behaving in the proposed way. For example, you can't get a confirmed Datsun buyer to switch to a Cadillac; he might be persuaded it is time for a new Datsun. As you'll soon see, interesting findings have emerged from laboratory studies. Extrapolating from them to the real world, however, is more complicated, but it seems a safe bet that some modest achievements will be possible.

Of course, in a world of billions of people and trillions of dollars, even tiny changes in consumption or safety or voting can have a significant impact. At least in some quarters, the opportunities for using subliminal therapy haven't gone unnoticed.

AUDIO CONDITIONING

King of the subliminal entrepreneurs is Hal Becker, Ph.D., president of the Behavioral Engineering Corporation, in Metairie, Louisiana. As the name implies, the company engineers behavior. Recently Dr. Becker was excited about a trick he plays on shrimp. "During the day shrimp bury themselves in the ocean mud and shrimpers can't scoop them up with nets. So I put an electric field in front of the net. Shrimp jump up like a knee jerk, and are carried away." Becker says, "Actually the U.S. government worked out the idea fifteen years ago, but it's never been practical because of polarization, which occurs in ocean water. But I solved these problems while implanting electrodes in the human brain when I was an engineer at Tulane Medical School. You see, the brain is basically a pall of salt water.

On land, Becker's subjects are human. Since April 1979 he has marketed a device known informally as Dr. Becker's Black Box. Basically a sound mixer like those used by disco DJs, the box weaves a prepared subliminal message into bland music. The first tapes were for honesty enhancement. Now Becker has branched out into a variety of other applications and has installed some 35 black boxes — at an annual fee of $4,800 — in some 15 businesses. Several East Coast department stores use the device to discourage shoplifting. Another box whispers encouragement in a New York real estate office. 'My time is valuable dollars now reward is coming. I feel good. Someday there will be audio conditioning in the same way we now have air conditioning,' Becker declares. He is now considering hundreds of other requests including some from professional football players that want to have subliminal pep talks.

Where families, schools and churches have failed in recent years, subliminal communication is ready to step in. Listening to Becker subliminals are nothing short of a heaven-sent gateway to success and happiness. "When we put a tape in a real estate office it increases profits. But it will also help employees realize that they are important not only to themselves but to management," he says. "If we could put subliminal public service messages on television we could reduce highway deaths by telling people to drive safely. We could get people to eat properly and eliminate excess weight in one generation."

Not all of Becker's potential clients share his good intentions. Among those who have contacted him are politicians running for office and religious fanatics seeking to convert the world. But no cause for alarm. The good doctor says, 'I don't make every installation that is requested. I choose those whose credibility and integrity I can
As proof of his claims, Becker points to impressive testimonials from clients, citing turnabouts in shoplifting and in staff morale. The signatures have been purged from the documents because Becker's clients demand secrecy lest customers should boycott their businesses if they knew black boxes were being used. Most employers even fail to tell their employees that they are being "subliminally activated" because only one disgruntled worker is needed to sue over whether Americans have a right to privacy within their own minds.

One user, the MacDonagh Medical Center in Gladstone, Missouri, did agree to speak with Omni. Its administrator said, "Since we started using the relaxation tape fainting in our intravenous clinic is no longer a serious problem. We also used an anti-smoking tape in the staff lounge from a count of cigarette butts. It also seems to be working. I'm still not a hundred percent convinced, but something's working!"

There is one problem: Becker's evidence would not even earn him a passing grade in a freshman psychology course. He employs no control groups. It is always possible that fainting or fainting had declined for other reasons. Perhaps the black box is only a sophisticated placebo? Therefore, scientists want Becker to conduct rigorous tests. Businessman Becker has no patience with such academic fussing. "They may worry about those things in the ivory towers, but when I talk to the president of a company he doesn't care. He wants results. I show him results!"

**SUBLIMINAL SALES PITCH**

Hal Becker may be the most outspoken proponent of subliminal technology, but he is by no means the only one. In recent years a quarter-century-old taboo against dabbling in the subconscious has begun to disappear.

During the Christmas season of 1973, the first subliminal TV ad was aired. The pitch for a children's toy called Husker Du was spiced with a subliminal command "Eat It!". When a consumer advocate blew the whistle, the red-faced distributors pleaded ignorance and blamed the gimmick on "an exuberant young advertising man. The Federal Communications Commission was not amused. It issued a public notice calling subliminal advertising "deceptive and contrary to the public interest."

Five years later the FCC carved out a bit of an exception when it authorized a Midwest TV station to broadcast a subliminal appeal for a killer to surrender to police: "CONTACT THE CHIEF, the message said. The killer never did. Of course, he or she may have been tuned to some other channel."

Hollywood comfortably beyond the FCC's purview has also attempted subliminal stunts. "The Exorcist," a movie that produced some of the most violent audience reactions ever included subliminal shots of a terrifying "death mask" in the old priest's...
dram sequence. Curiously it slipped Warner Brothers corporate mind to mention the subconscious manipulation and only later did Warners admit to it.

Can any of these gimmicks really work? Absolutely says Jagdish Sheth, president of the American Psychological Association's Division on Consumer Psychology: "The controversy has always been over changing people's attitudes. That you can do. What you can do is trigger a prior attitude or predisposition.

Buying popcorn and soda at a movie is acceptable behavior, so a subliminal advertisement about the products should work well. But selling a refrigerator in a movie theater wouldn't work. A subliminal cut in a horror movie will be very effective. Partly it is because people go to the movie to be scared and partly because fewer defenses are available against subliminal messages.

Subliminal advertising won't make Avis Number 1. An early study found, for example, that showing the message 'EAT BEEF' doesn't induce a craving for beef. It did however increase sandwich consumption in general. A consumer's preference hierarchy can't be changed by these methods, according to Del Hawkins, dean at the University of Oregon's School of Business. Instead, the effect of subliminal messaging will be spread over all similar products. Of course that limitation doesn't render subliminal methods useless. In a supposedly dog-eat-dog world, many corporate canines would rather form a pack so that all might dine on a larger piece of consumer spending.

Applying subliminal messages to the political arena, Sheth says, will bring more people to the polls. But it won't change their votes. They'll get people already predisposed toward a candidate to actually go out and cast a ballot.

The prospect is staggering. Elections these days are fought and won on voter turnout. Imagine if one party could bring out the subliminal vote? Discovery of the ploy would of course trigger a scandal on a scale commensurate with Watergate. That is unless Democrats could subliminally suggest that citizens simply 'vote'—as a sort of public-service message. Since many more Democrats than Republicans neglect to cast ballots, the seemingly impartial message could provide the margin to keep the GOP out of power for years.

TESTING THE PSYCHE

Subliminal engineering, like most technologies, is only as dangerous as the person who puts it to work. Recently some very healthy ideas for its use have come from all places: the armed forces, military men tend to be headstrong about newfangled ideas, and Sweden's Air Force is no exception. When psychologist Ulf Kragh suggested a subliminal Defense Mechanisms Test for pilot selection in 1960, officers were dubious. After ten years of tests they were finally persuaded. Since 1970 administering the DMT has been a standard operating procedure.

The test consists essentially of pictures flashed instantaneously on a screen. One, for example, shows a boy playing a violin and being threatened by a menacing face off to one side. In the brief moment the picture is shown, the pilot cadets subconsciously transform the image to protect the boy. Their exact reaction reveals information about their defense mechanisms. Ironically good defenses turn out to be bad credentials for flying. As Kragh discovered, those who demonstrated the strongest impulse to protect consistently dropped out or flunked out or crashed their airplanes. After three years not a single trainee was left.

As a result of implementing such a screening program our attrition rate has dropped from seventy percent in 1970 to thirteen percent today, says Thomas Neumann, a psychologist for the Swedish Air Force. Also, in the past eighteen months we have had only two major accidents. Statistically we should have had fifteen. We attribute this partly to the DMT selection in the past year the Norwegian and Danish air forces have adopted the subliminal test. The RAP and the Dutch Air Force are also looking into it, but the United States has expressed no interest.

At Southampton University in England, Professors Ian Lee and Alan Tyrer are using a movie to flood agoraphobics with their worst nightmares to help them overcome their fears. Some patients see the film subliminally others see it superliminally or consciously still others see no movie at all. The two groups that actually see the film improve by about the same amount (com pared with the control group) but the subliminals are tense and hate the treatment. The subliminal patients by contrast are unaware of the treatment and attribute their improvement to their own efforts.

Professor Lloyd Silverman has been using subliminal techniques in applications of Freudian psychology at New York University and at Veterans Administration hospitals. Overweight women who received the message: MOMMY AND I ARE ONE-LOOK MORE WEIGHT THAN THOSE WHO RECEIVED THE NEUTRAL SENTENCE: PEOPLE ARE WALKING. Silverman has also worked with schizophrenics, stutterers and even some law students at Queens College.

Despite his success, the professor doesn't look forward to the day when all troubles will be solved subliminally. "I'm uneasy about the idea. I could see a weight watchers group or antismoking group picking it up. But you have to be very careful about the mental health implications. Silverman warns that seemingly benign messages sometimes produce dangerous results. One patient reacted violently to the "harmless message" PEOPLE ARE WALKING. Her sadistic father apparently had pun-

CONTINUED ON PAGE 107
ACTIVISM

A new grass-roots movement may get America back on the launchpad

BY TRUDY E. BELL

Look ahead just a few years and you'll see why so many Americans are disgusted with the state of our space program and also why so many of them have decided to take matters into their own hands.

In 1986 Halley's Comet will again sweep past the sun for its once-in-a-lifetime appearance. The Japanese Planet-A probe will send back closeup images of the comet as it streaks past Venus. The joint French-Russian probe will obtain additional data. Here in the United States those of us who don't have backyard telescopes will have to settle for looking at pictures supplied by foreigners in our newspapers and magazines. President Carter canceled NASA's Halley-Tempel 2 comet probe as a misguided economy measure, and as of this writing the long-planned mission remains dead.

Though the Carter Administration and many sessions of Congress have considered space exploration and development to be too costly a luxury, other nations have counted their priorities differently:

• France and West Germany are still hard at work on Ariane, a low cost booster that could take Western world's launch business away from our shuttle long before Halley's Comet arrives.
• China and Japan, in a joint venture, hope to orbit two astronauts for a full week by the end of 1986. The launch vehicle for this historic mission will be China's Long March 3, a three-stage booster modified from its CSS-X-4 ICBM.
• The USSR, in time for the twenty-fifth anniversary of Yuri Gagarin's flight in 1961, will probably

PHOTOGRAPH BY CHRISTOPHER SPRINGMAN
announce its plan to send a man to Mars before the decade is out. Meanwhile the
Soviet Union's 12-man space station
should have been in continuous operation
for four years.

The irony in all this is not simply that the
United States once held a commanding
lead in space and is now losing it by de-
fault. Our government lost interest in the
space program just when there was a re-
surgence of popular support.

According to an annual survey con-
ducted since 1973 by the National Opinion
Research Center at the University of
Chicago, this support has rebounded
progressively since its all-time low in 1975
and 1976. Today nearly half the American
population think that the amount the United
States is spending on space development
is about right. But 12 percent believe that
NASA is badly underfunded. To sociologist
Robert D. McWilliams of Virginia Poly-
technic Institute the data mean that no
fewer than 25 million Americans can be
counted among the pro-space forces.

Accompanying this article is a directory
of space-activist groups. These organiza-
tions have proliferated in the last three
years. Where once such groups as the L-5
Society squandered their energies on
internal squabbles they are now learning
new sophisticated tactics to make their
case heard. What the environmentalists
and antinuclear activists were in the 1970s
space advocates are now becoming—a
broad-based movement capable of sway-
ing public policy and if need be, elections
to promote their cause.

The directory covers 50 American space-
interest groups and 9 other space-
sympathetic organizations—nearly all of
them nationally active. If space-activist
groups restricted to local activities were
deducted, they would number well over 100.

And if the list included all the organizations
not specifically devoted to space develop-
ment but tending to support space activ-
ities—groups of astronomers, futurists,
science-fiction fans, amateur rocketeers,
and the like fall into this category—it would
run closer to 500.

If we look at the organizations them-
seves, some interesting trends can be dis-
cerned. Many of the trade and professional
groups were founded in the early days of
aviation but the citizen groups all ap-
ppeared after the launch of Sputnik 1 in
1957. More important they have multiplied
dramatically in the last five years. Fully two
thirds have been founded since 1977. Ac-
cording to Charles Chaler of the Public
Affairs Council, the sudden proliferation of
space-interest groups is a leading indi-
cator of issues that will gain considerable
political importance within five years.

It isn't only new groups that are appear-
ing but new goals and tactics too. The
oldest space-advocacy organizations are
educational. They simply hold meet-
ings and sponsor events to keep people in
formed of the latest developments and to
announce new results from space studies.

Some of the newer organizations, however,
seem bent on taking the space program
into their own hands.

Several bodies, such as the Space
Studies Institute, the World Space Foun-
dation, and the California Space Founda-
tion, are funding their own research on the
technological and social developments
needed for space exploration and devel-
opment—work that receives little or no fed-
eral support. Others such as the Space
Foundation provide seed grants to sup-
port "critical path" research in universi-
ties and industry.

Newest on the scene are the first citizens
political action committees (The aero-
space industry has had PACs for years.)
The Campaign for Space PAC was founded
last March and was followed in May by the
Citizens for Space PAC. Both were estab-
lished to support the campaigns of pro-
space political candidates—particularly
those in contests where a narrow margin of
votes would decide the winner.

The decision to enter the political arena
is a fundamental change of strategy for the
space movement. Space-interest groups are
composed primarily of scientists and
science-fiction fans. Most of their leaders
have come from the scientific and academic
communities. "The scientific community
tends to spurn traditional lobbying tech-
iques," as Brigette Rouson observed in the Can
gressional Quarterly (April 12, 1980). "One NASA spokesman said that scientists are more likely to produce studies than [to] call a Congressman."

By contrast, many of the environmental leadership came from the ranks of civil rights advocates and the anti-Vietnam War crusaders; they were experienced in politics when they took up the environmental cause. They provide a model the space groups must learn to follow if they are to be effective, and the space activists are determined to learn.

The results of their decision are already becoming apparent. Though some major citizens groups—notably the L-5 Society—were once plagued by dissonance, their members are now welding themselves into an effective lobbying force. The PACs have been supplemented by the Space Coalition, a lobbying organization led by Gerald Driggers, president of the L-5 Society, that intends to speak out as an effective political voice in all legislation involving space development. As an enticement to join it is waving membership fees for all individuals who belong to any existing space interest groups.

Tactically some groups are beginning to follow the footsteps of the antwar and environmental movements even more closely. They are calling on the resources and energy of college students, especially for such events as Space Week. Student space groups already exist on a dozen college campuses. Some, such as the one at the Polytechnic Institute of New York, have only a handful of members, the University of Maryland space organization claims 700 members. At least one, the Space Farers, hopes to coordinate activities on campuses throughout its region.

Many others are working hard to attract new converts. In doing so, they are experimenting with such sophisticated techniques as direct mail appeals targeted to such normally untapped groups as women and the elderly.

This is one of the critical challenges facing the space advocates. For years they have preached largely to one another and have aimed their arguments accordingly. There are many reasons to develop space of which only a very few appeal to any particular constituency. Space groups must learn to select arguments that will appeal to a given audience, not just to follow converts.

Many space supporters are much like the adventurers of past centuries who needed no more reason to explore a frontier or cross a vast ocean than the mere fact that it was there. But the magnificent adventure of the Apollo moon landings appeared to untold millions as nothing more than a costly irrelevance. What good were visions of space colonies when children were starving in many poverty-striken countries, oil supplies were dwindling, and pollution was growing ever worse?

The space advocates must make it clear to many others that space is a resource
one that can directly enrich life on Earth Unmanned satellites can warn of crop de- stroying frosts, monitor pollution and help locate petroleum and other useful minera ls. Manned solar-energy satellites can replace vanishing oil, and there are rich stores of minerals to be retrieved from the moon and the asteroids.

Space industrialization does not fly in the face of the limits to growth, it makes them obsolete. The wise use of space might help us set our earthly house in order. Space-interest groups might just as well be able to recruit the allies they need if they can remember that the real issue is human survival.

Some of the newest space-interest groups are working to meet this challenge. The two political action committees, for example were founded in part to form coalitions centered on the public needs that can be fulfilled by space development. Another example is the Space Coalition. According to L-5 Society lobbyist Leigh Ratiner, the coalition is the only organization engaged in Washington politics in which private citizens and industry have united to work for common goals.

These political efforts have just garnered outside politics, the approach to broader constituencies is further along. The Planetary Society may have been the first of the space-interest groups to see that the Space Age is a cultural phenomenon as well as a technological one. Its board of advisors includes not only such heavyweight scientists as Carl Sagan and Bruce Murray but actor Paul Newman, entertainer Johnny Carson, poet Diane Ackerman, John Gardiner, the founder of Common Cause Harry S. Ashmore former editor in chief of the Encyclopædia Britannica,” and Dr Lewis Thomas President of the Sloan-Kettering Cancer Center.

But it's these organizations are so successful in redeeming our space program they must overcome another problem. Space deals with abstractions with the future. with long time scales and with an environment 200 miles overhead. 200 miles overhead that only a few dozen human beings have ever experienced. Space is cognitive. It's not in the guts. The challenge is to make it real.

"The environmental people can take you down the road and show you a polluted river," says Courtney Stadd, formerly of the National Space Institute. UNICEF can let you hold a hungry baby. The space people can only show you a picture.

Fortunately Stadd is not the only person in the space community who recognizes the need to promote concrete images. The Planetary Society pinned some of its hopes for NASA's sitting planetary science program on last November's Voyager images of Saturn. And Barbara Evans of the Space Studies Institute voices concern common to many groups. "There is a sense of determination to get our acts together now. When the shuttle is launched this year space will once again become real to the American public. We want to be prepared. Whether their efforts will have any effect remains to be seen. But most leaders of such organizations are only too aware that time may be running out. After Voyager 2 passes Saturn this summer, there may be no U.S. spacecraft visiting any body in the solar system until Galileo goes into orbit around Jupiter in 1987—unless Congress can be persuaded to restore a mission to Halley's Comet in 1986.

One critical factor in how successfully legislators take the space-interest groups. Many lump even the most serious promoters of space development together with fire-dragging those who believe in UFOs and other cultists. That image evolved in the early 1970s, when bitterness and commission among the space organizations combined with amateurish leadership to make space fans look incompetent. It no longer squares with the facts.

A new professionalism is emerging in the citizens space groups. The Planetary Society and the World Space Foundation are both led by planetary scientists working at the Jet Propulsion Laboratory in Pasadena. Others headed by educators, scientists or sociologists include the Campaign for Space, the SISSS, the L-5 Society, the Niagara University Space Settlement Studies Project, the Space Studies Institute and the Sunsat Energy Council. These are seasoned professionals with a realistic sense of the work to be done and with experience in working with the research community and the federal government.

"We see the formal machinery being set up between the major groups to combine their strengths and constituencies," Stadd says. "These elements are beginning to coalesce, laying the foundation for a Sierra Club-type movement a decade from now."

At least a dozen of the principal national groups have set out to coordinate their efforts informally. The Future Alliance, the World Space Federation, the AIAA's Greater New York Section and the Ad Hoc Coordinating Committee on Space (consisting of eight of the largest professional and citizen groups) have established or are setting up networks to keep local groups informed of activities in other regions.

The best proof of competence, of course, has been effective action. The space organizations are now adopting techniques that reverse the environmentalists community recycling centers. They are testifying before Congress, writing letters and circulating petitions, they are setting up community-action programs on campuses and Space Week events in cities.

Ironically some of the most difficult allies to enlist are the aerospace companies, which stand to benefit most immediately from a strong space program. David Webb of the Campaign for Space says, "Space businesses have decided that their heritage of a national government program compared to civil aviation and defense contracts; that even though the corporations would be eager to have space contracts, they won't risk the post just to get them. So the space movement has to appeal directly to the grass roots." The industrial "brick wall" may be the toughest obstacle standing in the way of the space movement. If space supporters can influence the necessary legislation, however, the companies may quickly rebel.

The worst threat to the space program in fact may not be anyone's indifference, but a misconception spread by some of the space effort's well-meaning allies. NASA, Rockwell Grumman, and such popular writers as the AIAA's Jerry Green in his book Enterprise have given people the idea that the shuttle heralds a new era of space explo- ration—one in which going into space will be routine. Even dull. Shuttles launch from the Kennedy Space Center won't be covered in the news any more than 747 takeoffs from Kennedy Airport. And that's good, because it means space exploration will have achieved acceptance.

And five years from now this might be true. But shuttle flights will be far from routine in 1981. The astronauts flying them are taking on as dangerous a challenge as any of the Mercury Gemini or Apollo astronaunts did. A single accident on a shuttle flight—remember that Apollo 1 ended in tragedy and that Apollo 13 nearly did—could shake the public so badly as to obliterate the shuttle program.

We have put virtually all our space eggs into the shuttle's cargo bay. The shuttle is our only major civilian commitment to space, and it has been kept alive only by straining other programs. A disaster with the shuttle could put the United States out of the civilian space business altogether.

In 1982, just before Wally Schirra's Mercury flight in Sigma 7, President Kennedy declared at Nasa's Goddard that "the exploration of space will go ahead, whether we join it or not. It is one of the great adventures of all time, and no nation that expects to be the leader of other nations can expect to stay behind in the race for space."

The space advocates have taken upon themselves a heavy burden. It is they who will finally determine our nation's role in the future of mankind.

For a list of groups that promote interest in space, see page 90.}

54 OMNI
STANDING WOMAN

BY TSUTSUI YASUTAKA
Translated from the Japanese by David Lewis

I stayed up all night and finally finished a forty-page short story. It was a surreal entertainment piece capable of neither harm nor good. "These days you can't write stories that might do harm or good. It can't be helped." That's what I told myself while I fastened the manuscript with a paper clip and put it into an envelope.

As to whether I have it in me to write stories that might do harm or good, I do my best not to think about it. It were to go around thinking about it, it might want to try.

The morning sunlight hurt my eyes as I stepped on my wooden clogs and left the house with the envelope. Since there was still time before the first mail truck would come, I turned my face toward the park. In the morning no children come to this park, a mere eighty square meters in the middle of a cramped residential district. It's quiet here. So I always include the park in my morning walk. Nowadays, even the scarce green provided by the ten or so trees is priceless in the megapolis.

I should have brought some bread. I thought. My favorite dogpillar stands next to the park bench. It's a sizable dogpill with buff-colored fur, quite large for a mongrel.

The liquid-fertilizer truck had just left when I reached the park. The ground was damp and there was a faint smell of chlorine. The elderly gentleman I often saw there was sitting on the bench next to the dogpillar. Feeding the buff post what seemed to be meat dumplings. Dogpillars usually have excellent appetites. Maybe the liquid fertilizer absorbed by the roots sunk deep in the ground and passed on up through the legs, leaves something to be desired.

They'll eat just about anything you give them. "You brought him something?" "Yes," I replied, sitting down beside him. "He eats exactly like the dog I used to have."

The dogpillar looked up at me with large, black eyes and wagged its tail.

"Actually, I keep a dog like this fellow myself," the man said, scratching the ruff of the dogpillar's neck. "He was made into a dogpillar when he was three. Haven't you seen him? Between the haberdashery and the men shop on the coast road isn't there a dogpillar there that looks like the fellow?"

"I nodded, adding, "Then that one was yours?""

"Yes, he was our pet. His name was Hachi. Now he's completely vegetized. A beautiful dogtree." "Now that you mention it, he doesn't look a lot like this fellow. Maybe they came from the same stock."

"And the dog you kept?" the elderly man asked. "Where is he planted?"

"Our dog was named Buff."

"Yes," I replied, sitting down beside him. He "He's planted beside the entrance to the cemetery on the edge of town when he was four. Poor thing, he died right.
and came the left thought, didn't I?"

"The mighl."

"Haven't wanted thought."

"Flamed at the man's profile. Now that he said so it was a face I seemed to have seen somewhere before. I started to ask his name hesitated and fell silent.

The elderly man said abruptly: 'It's be a hard world to write in.'

I lowered my eyes ashamed of myself who still continued to write in such a world.

The man apologized humbly at my sudden depression.

"That was rude I'm not criticizing you I'm the one who should feel ashamed"

"No I told him after looking quickly around us 'I can give up writing because I haven't the courage. Giving up writing! Why after all, that would be a gesture against society.

The elderly man continued stroking the dogpillar. After a long while he spoke:

'It's painful suddenly giving up writing. Now that it's come to this I would have been better off if I'd gone on boldly writing social criticism and had been arrested. There are even times when I think that. But I was just a dilettante never knowing poverty craving peaceful dreams. I wanted to live a comfortable life. As a person strong in self-respect I couldn't endure being exposed to the eyes of the world. I ridiculed. So I quit writing. A sorry tale.

He smiled and shook his head. "No no let's not talk about it. You never know who might be listening even here on the street."

I changed the subject: "Do you live near here?"

"Do you know the beauty parlor on the main street? You turn in there. My name is Hiyama. He nodded at me. "Come over sometime I'm married but..."

"Thank you very much."

I gave him my own name.

I didn't remember any writer named Hiyama. No doubt he wrote under a pen name I had no intention of visiting his house. This is a world where even two or three writers getting together is considered illegal assembly.

"It's time for the mail truck to come."

"Taking pains to look at my watch! "I stood up."

"I'm afraid I'd better go."

He turned a sadly smiling face toward me and bowed slightly. After stroking the dogpillar's head a little I left the park.

I came out on the main street but there was only a ridiculous number of passing cars pedestrians were few. A cattree about thirty to forty centimeters high was planted next to the sidewalk.

Sometimes I come across a cattree that has just been planted and still hasn't become a cattree. New catpillars look at my face and meow or cry but the ones where all four limbs planted in the ground have vegetized with their greenish faces stiffly set and eyes shut light only move their ears now and then. They are catpillars that grow branches from their bodies and put out handles of leaves. The mental condition of these seems to be completely vegetized - they don't even move their ears. Even if a cat's face can still be made out it may be better to call these cattrees.

Maybe I thought it's better to make dogs into dogpillars. When their food runs out they get vicious and even turn on people. But why did they have to turn cats into calpillar? Too many strays? To improve the food situation by even a little? Or perhaps for the greening of the city.

Next to the big hospital on the corner where the highways intersect are two manpillars. and ranged alongside these trees is a manpillar. This manpillar wears a postman's uniform and you can tell how far its legs have vegetized because of its trousers. It is male thirty-five or thirty-six years old tall with a bit of a stoop. I approached him and held out my envelope as always.

'I registered mail special delivery please.'

The manpillar nodding silently accepted the envelope and took stamps and a registered-mail slip from his pocket.

I looked around quickly after paying the postage. There was no one else there. I decided to try speaking to him. I gave him mail every three days but I still had that chance for a leisurely talk.

'What did you do?' I asked in a low voice.

The manpillar looked at me in surprise. Then after running his eyes around the area he answered with a sour look. 'Don't do to go saying unnecessary things to me.
Even me. I'm not supposed to answer.

I know that. I said, looking into his eyes.

When I wouldn't leave he took a deep
breath. "I just said the pays low. What's
more, I got heard by my boss. Because a
postman's pay really is low. With a dark
look, he jerked his jaw at the two man-
trees next to him. These guys were the same.
Just for letting slip some complaints about
low pay. Do you know them?" he asked me.

I pointed at one of the manatrees. "I
remember this one. Because I gave him a lot
of mail. I don't know the other one. He was
already a manatee when we moved here.

"That one was my friend," he said.

Wasn't that other one a chief clerk or
section head?"


"Don't you get hungry or cold?

"You don't feel that much," he replied.
still expressionless. Anyone who's made
into a manatee soon becomes expression-
less. Even I think I've gotten pretty
plantlike. Not only in how I feel things but in
the way I think too. At first I was sad, but
now it doesn't matter. I used to get really
hungry, but they say the vegetating goes
faster when you don't eat.

He stared at me with lightless eyes. He
was probably hoping he could become a
manatee soon.

"Talk says they give people with radical
ideas a lobotomy before making them into
manatees. But I didn't get that done. Either
Even so a month after I was planted here, I
didn't get angry anymore.

"He glanced at my wristwatch. "Well, you
better go now. It's almost time for the mail
truck to come."

"Yes. But still I don't want to leave. And I hesi-
tated unassay.

"You," the manatee said. "Someone you
know didn't recently get done into a manat-
tree did they?"

"Cut to the quick. I stared at his face for a
moment, then nodded slowly.

Actually, my wife.

"Hmm. Your wife is it?" For a few moments
he regarded me with deep interest. "I won
dared whether it wasn't something like that.
Otherwise nobody ever bothers to talk to me.
Then what did she do your wife?"

"She complained that prices were high at
a housewife's get-together. Haa then been
all fine, but she criticized the governor too.
I'm starting to make it big as a writer,
and I think that the eagerness of being that
writer's wife made her say it. One of the
women there informed her. She was
planted on the left side of the road looking
from the station toward the assembly hall
and next to that hardware store.

"At that place. He closed his eyes a
little, as if reflecting the appearance of the
buildings and the stores in that area.
"It's a fairly peaceful street. Isn't that for
the better? He opened his eyes and looked at
me searchingly. "You aren't going to see
her are you? It's better not to see her too
often. Both for her and for you. That way you
can both forget faster."

I know that.

"I know that.

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right for your palm.
"I'm not sure. It appears to be some sort of beanstalk."
I hung my head.

"Your wife?" he asked, his voice turning slightly sympathetic. "Has anyone done anything to her?"

"No. So far nothing. She's just standing but even so..."

"Hey." The manpiller, serving as a post box, raised his jaw to attract my attention. "It's come. The mail truck. You'd better go."

"You're right."

Taking a few wavering steps as if pushed by his voice, I stopped and locked back. "Isn't there anything you want done?"

He brought a hard smile to his cheeks and shook his head.

The red mail truck stopped beside him. I moved on past the hospital.

Thinking I'd check in on my favorite bookstore. I entered a street of crowded shops. My new book was supposed to be out any day now, but that kind of thing no longer made me the slightest bit happy.

A little store on the bookstore in the same row is a small, cheap candy store, and on the edge of the road in front of it is a manpiller on the verge of becoming a mantres. A young male it is already a year since it was planted. The face has become a brownish color, and the eyes are tightly shut. Tall back slightly bent. The posture slouching a little forward. The legs, torso, and arms visible through clothes reduced to raggs by exposure to wind and rain are already vegetated here and there branches sprout. Young leaves bud from the ends of the arms, raised above the shoulders, like beating wings. The body has become a tree, and even the face no longer moves at all. The heart has sunk into the tranquil world of plants.

I imagined the day when my wife would reach this state, and again my heart winced with pain. Trying to forget. It was the anguish of trying to forget.

If I turn the corner at this candy store and go straight. I thought. I can go to where my wife is standing. I can meet my wife. I can see my wife. But I won't do it. I told myself. There's no telling what might see you..."

"If the woman who informed you was really in trouble, I came to a halt in front of the candy store and peered down the road. Pedestrian traffic was the same as always. It's all right. Anyone would overlook it if you just stand and talk a bit. You'll just have a world or two. Defying my own voice screaming. Don't go!" I went briskly down the street.

Her face pale, my wife was standing by the road in front of the hardware store. Her legs were unchanged, and it only seemed as if her feet from the ankles down were buried in the earth. Expressionlessly as if striving to see nothing, feel nothing, she stared steadily ahead. Compared with a few days before, her cheeks appeared a bit hollow. Two passing factory workers pointed at her, made some vulgar joke, and passed on, guffawing uproariously. I went up to her and raised my voice.

"Michiko!" I yelled right in her ear.

My wife looked at me, and blood rushed to her cheeks. She brushed one hand through her tangled hair.

"You've come again? Really you mustn't."

"I can't help coming."

The hardware-store mistress, tending shop, saw me. With an air of slighted indifference, she averted her eyes and raised to the back of the store. Full of gratitude for her consideration, I drew a few steps closer to Michiko and faced her.

"You've gotten pretty used to it?"

With all her might she formed a bright smile on her stiffened face. "Mmm, I'm used to it."

Last night it rained a little.

Still gazing at me with large, dark eyes, her nodded lightly. Please don't worry. I hardly feel anything.

"When I think about you, I can't sleep. I hung my head. You're always standing out here. When I think that I can't possibly sleep. Last night I even thought I should bring you an umbrella.

Please don't do anything like that." My wife frowned just a little. It would be terrible if you did something like that.

A large truck drove past behind me. White dust thinly veiled my wife's hair and shoulders, but she didn't seem bothered. Standing isn't really all that bad. She spoke with deliberate lightness, working to keep me from worrying.

It seemed that her words had lost a shade of delicacy, and the range of her emotions had become somewhat more. Watching from the sidelines.
like this—seeing her gradually grow more expressionless. It's all the more disheartening for having known her as she was before—those keen responses, the bright wakacy the rich full expressions.

These people. I asked her running my eyes over the hardware store. Are they good to you?

Well, of course. They're kind at heart. Just once they told me to ask if there's anything I want done. But they still haven't done anything for me.

Don't you get hungry?
She shook her head.

It's better not to eat.

So I could not endure being a mannequin. I was hoping to become a mannequin even so much as a single day faster.

So please don't bring me food. She stared at me. Please forget about me. I think certainly even without making any particular effort. I'm going to remember about you. I'm happy that you come to see me. But then the sadness is like a deep spring that never stops running.

Of course you're right. But—Despairing this self that could do nothing for his own I hung my head again. But I won't forget you. I nodded. The tears came. I won't forget. Ever.

When I raised my head and looked at her again, she was gazing steadily at me with eyes that had lost a little of their lustre. Her whole face beamng in a faint smile like a carved image of Buddha. It was the first time I had ever seen her smile like that.

I felt I was having a nightmare. No. I told myself. This isn't your wife anymore.

The suit she had been wearing when she was arrested had become terribly dirty and filled with wrinkles. But of course I wouldn't be allowed to bring a change of clothes.

My eyes rested on a dark stain on her skirt.

Is that blood? What happened?

"Oh, yes," she spoke faltering down at her skirt with a confused air. Last night two drunks played a prank on me.

The bastards! I felt a furioius rage at their inhumanity. If you put it to them, they would say that since my wife was no longer human, it didn't matter what they did.

They can't do that kind of things! It's against the law!

That's right. But I can hardly appea.

And of course I couldn't go to the police and appeal either. If I did, I'd be locked up or even more of a problem person.

The bastards! What did they?

I bit my lip. My heart hurt enough to break. Did it bleed a lot?

Mmm. A little.

Does it hurt?

It doesn't hurt anymore.

Michiko, who had been so proud before, now showed just a little sadness in her face. I was shocked by the change in her. A group of young men and women, penetratingly comparing me and my wife. My wife passed behind me.

You'll be seen, my wife said anxiously.
From the family who brought you The Book of Lists, here comes The Book of Predictions

FUTURE CHRONOLOGY
BY DAVID WALLECHINSKY, AMY WALLACE & IRVING WALLACE

It is a measurement of chronology. This chronology records events that will, or may, happen in the next 50 years or so. The events that will occur—or are most likely to take place—are events that have been scheduled, like a sports event, an election, a heavenly cycle, an anniversary. These more or less sure things will be.

PAINTING BY RUDOLF HAUSNER
1982
- A massive earthquake hits northern Iran and kills a large toll of lives. The inability of the government to deal with the crisis leads to its downfall. The Ayatollah Khomeini (or his heir) is overthrown by a coalition of minorities.
- Automobile gas rationing takes effect throughout the Western world.
- Spain hosts the twelfth World Cup Soccer Championship.
- The city of Juneau is replaced by Willow as Alaska's new state capital.

1983
- The USSR puts into operation a particle-beam accelerator that can protect the nation against any guided-missile attack.
- The USSR achieve clearcut strategic nuclear superiority over the United States. The NATO alliance, Communist China and Japan combined.
- Saudi Arabia and Libya lose their oil wealth. In each nation a democratic form of government takes power.
- With the crash of the U.S. stock market, a long economic depression begins.
- The U.S. spacecraft, Pioneer 10, launched 11 years earlier is just passing the planet Neptune.
- The first space telescope, which revolutionizes astronomy, is launched.
- The Alcan oil pipeline from Alaska routed through Canada to the northwestern United States, begins to deliver its crude.

1984
- The XXIII Summer Olympics, staged in Los Angeles, go off possibly.
- The United States elects a president.
- The risk of nuclear war peaks with central Europe and the Middle East presenting special dangers.

1985
- Israel formally annexes the West Bank and the Gaza Strip.
- People work a four-day 32-hour week.
- Most family homes have installed flushless toilets that compost wastes (one brand of toilet uses a sound track that makes a flushing noise whenever the toilet lever is pressed, even though no water is used in the system).
- A home television set has 300 channels.
- Using expensive digital synthesizers, you are able to play any musical instrument you are able to play any instrument.
- A national health insurance goes into effect in the United States. This federal insurance covers 90 percent of your medical costs.
- The U.S. government nationalizes all gasoline stations.
- Gasohol totally replaces gasoline for use in motor vehicles.
- The first nonscientist passengers are carried into orbit by the space shuttle.
- A private company selling to any customer launches a satellite into space. The company's first customer is China.
- Hally's Comet soars through the skies once more. It is most clearly seen in November and December.

1986
- The People's Republic of China places an astronaut into orbit—and becomes the third nation with a man in space.
- A computer program beats the world chess champion.
- Colombia hosts the thirteenth World Cup Soccer Championship.
- The majority of working people are on flextime—setting their own hours for going to work and leaving work.
- Srihan Sinh, who was convicted of murdering Robert F. Kennedy, comes up for parole.

1987
- Most courthouses are open to television coverage. Criminal and civil courtroom proceedings are so popular they have replaced soap operas and game shows.
- Your television screen can project three-dimensional pictures through the use of laser holography.
- A bottle of hard liquor costs $125; a double martini at a bar costs $20 and a pack of cigarettes costs $5.
- The United States legalizes marijuana.
- Some of the leading brands for sale in your liquor store or tobacco shop are Colombian Santa Marta Gold, Primo Mexican and California Sinsemilla. (Colombia legalized marijuana two years earlier).
- The British sport of cricket becomes a national sport in the United States.
- A computer chess champion proves superior to almost all grand-master human chess players.
- The bicentennial of the signing of the U.S. Constitution is celebrated.
- Since winter in the eastern United States have become harsher, almost all large corporations are transferring their headquarters to California and Florida.
- One of three California cities—San Diego or Los Angeles or San Francisco—suffers several destructive earthquakes along a major fault line.
- A locust plague sweeps the eastern United States.
- The U.S. public school system collapses and is replaced by one-room local schools in every neighborhood.
- A woman priest is ordained in the Roman Catholic Church.
- New scientific experiments prove that Einstein's theory of relativity is partially wrong.
- In South Africa, black resistance increases as black leaders resort to urban terror. The white government makes dramatic concessions to blacks in social and economic fields, but the whites continue to hold military and political power.

1988
- The track record for the mile is now 3 minutes 32 seconds.
- Women compete in the Olympic marathon for the first time.
- A 1,000-seat jetliner has its inaugural flight.
- Most laborers working on assembly lines are replaced by robots.
- West Germany and East Germany fight an undeclared war. No other nation is involved.
- Both the United States and the USSR invade Iran, the Russians occupying the Iranian provinces of East and West Azerbaijan and the Americans landing on the northern coast of the Shatt of Hormuz. The incident ends peacefully.
- A terrorist group gets its hands on an atomic bomb.
- A U.S. presidential election is held.
- The first human being is cloned.

1989
- The median age in the United States is 32.5.
- Roger Maris's home run record of 61 is broken. Someone hits 63.
- Weather forecasting achieves accuracy for 30 day periods.
- A computer makes an original scientific discovery and its program is nominated for a Nobel Prize.
- Because of excessive unemployment caused by increasing automation, work riots occur in most industrialized nations.
- Nuclear war breaks out between India...
and Pakistan destroying major population centers.

1990
- Spanish joins English as an official language in the United States
- Parts of Texas and California split off to form new states
- Vegetarians outnumber meat eaters in the United States
- Most large corporations provide paid educational sabbaticals
- Control of outer space shifts from civil to military authority in the United States
- NASA gives way to the U.S. Department of Defense
- A male astronaut in outer space shoots and kills a crewmate in an argument over a woman
- All school buildings vanish as students receive their education from portable communications linked appliances that are cast on pieces of silicon
- Every automobile is equipped with microcomputer sensor and control actuator for self operation by voice command. Also, every car is equipped with collision avoidance electronic gadgetry
- Wrist telephones are popular
- Daily body checkups by computer provide ample warning of any impending illness
- In the past ten years, heart disease has decreased 37 percent because of improved diet and increased exercise.
- Diabetics have pumps implanted in their bodies to feed them insulin automatically as they require it
- Artificial eyesight is invented for blind people
- Chemicals are produced that arrest senility in the aged
- The Communist government of the USSR is overthrown by a social democratic faction working inside the party.

1992
- The common cold is treated successfully with interferon
- The first human is brought back to life after being frozen and thawed
- Twenty-seven percent of Americans are illiterate (it had been 1 percent in 1990.)
- More than 90 percent of the households in the United States play electronic television games for recreation
- The average secretary earns $25,000 a year but inflation continues to soar
- Four of the five women judges on the U.S. Supreme Court
**U.S. presidential election is held.

1993
- After a U.S. stock market crash and major depression, the United States ceases to be a great power. The USSR dominates most of the world.

1995
- A do-it-yourself device for music lovers comes on the market. You can buy an electric baton and conduct a recorded orchestra actually controlling the tempo and volume of the music.
- Ceremonies celebrate the fiftieth anniversary of the signing of the U.N. Charter.

1996
- In order to protest the rising rate of cancer among their ranks, workers set off a series of nuclear accidents at several nuclear power plants.
- U.S. presidential election is held.

1997
- Most U.S. companies install locker rooms and give time off for exercise.
- The long-time British lease on Hong Kong expires and Hong Kong returns to Chinese control unless the lease is extended.

1998
- First tourist service to outer space. All seats are booked a year in advance.
- A special gadget built into men's suits and women's dresses enables people to change the color pattern and shape of their garments.
- **Israel celebrates its fiftieth anniversary of independence.

1999
- The capital of the United States moves from Washington, D.C., to Minneapolis, Minnesota.
- **Pluto regains its position as the outermost known planet in our solar system.** A position Neptune had held for 20 years.
- **On December 31, the United States turns the Panama Canal over to Panama.

2000
- **More than 600 million people are living in absolute poverty.** More than half the world's population is living in cities.
- Most couples live together before getting married.
- **According to the Library of Congress. In this year all nonfiction books published between 1990 and 1940 will be disintegrating because of acid in their paper, poor quality ink, and pollution, and will be rendered useless.**
- Computer printout terminals in every neighborhood publish and bind any book while you wait.
- **Presuming no preventive action has been taken, the noise level on U.S. highways this year will be 50 percent greater than it was in 1990.**
- Cocaine is legalized in the United States. It is sold in liquor shops, packaged in snuffboxes bearing such names as Peruvian Flare and Bolivian Rock.
- Almost all illnesses are treated electromagnetically. Body cells are fooled into producing antibodies, coagulants, new tissue, and chemicals when they are exposed to certain kinds of electric and magnetic fields. This drugless treatment revolutionizes medicine.
- **All Persian Gulf countries run out of oil.**
Most new autos everywhere on Earth use alcohol or liquids converted from farm and forestry waste. On such fuels, each car gets 100 miles to the gallon.

- A shortage of oil starts a large-scale migration of people from cold parts of the world to warmer parts.
- The world's oceans are being used extensively as a source of minerals and energy. Ocean-floor and subfloor mining is accomplished by automated systems and remotely controlled robots.
- More than 50 percent of people over 16 will recognize that a Power Control Group (including Allen Dulles, Lyndon B. Johnson, J. Edgar Hoover, some members of the U.S. Joint Chiefs of Staff and others) conspired to murder President John F. Kennedy; probably arranged the assassinations of Robert Kennedy and Martin Luther King; tried to assassinate George C. Wallace; and probably assassinated Adlai Stevenson. Walter Reuther and others

**A U.S. presidential election is held**

- 50,000 people are living and working in space.
- The first children are born in a space colony orbiting Earth.
- An interplanetary ship brings back to Earth an alien virus that kills a tenth of the world's population.

2002

- If caught in the early stages every type of cancer is now curable.

2005

- All the walls of your living room are video screens. You can activate Dial-an-Environment and have the interior of the Taj Mahal projected on the screen so that you will feel you are inside the mausoleum.

2010

- A robot can now cross a busy highway without being hit.
- Football coaches still direct their teams from the bench, but their teams consist of robots.
- Because of worsening inflation, the United States issues a new currency to soften the impact of high prices. Many realistic people turn to barter.
- There is an open market for used and reconditioned human body parts.
- An artificial brain—as complex as the human brain—proves to have conscious thoughts and emotions.
- Authoritarian governments in various nations are using mind- and behavior-control chemicals on their subjects to suppress dissent.
- The USSR attempts to change its history by using tachyons—particles that can carry information backward in time.
- The black pope of Rome transfers the central seat of the church to the holy city of Jerusalem.
- International terrorists employing nuclear weapons destroy a major world capital. This leads to police repression, which in turn leads to a worldwide disarmament.

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A new film re-creates this terrifying best seller of sensory deprivation

ALTERED STATES

BY PADDY CHAYEFSKY

The isolation tank was nothing more than a coffin-like bathtub filled with a 10 percent solution of magnesium sulfate in water heated to 93°F, the temperature at which a floating body feels minimal gravity. A volunteer came by and Jessup went him to the EEG and EKG... The subject floated in darkness and silence... It seemed that depriving a person of external stimuli may bring into a whole new set of internal experiences. Their breathing became halting and patterned... At any rate, Jessup decided to take a shot at going into the tank himself.
He saw an image of a cluster of neurons, sleeping neurons, actually curled up in postures of sleep... These were lowest neurons, lodged in some bank of our mental computer, perceptions picked up somewhere in life and selectively filtered out of our national consciousness, the stuff of dreams. They were waiting to be activated, to be fired... "If there is an Osiris Consciousness... it took in a lot of sensory input, and that input is stored away somewhere, in our minds in the quantifiable form of memory. Memory is energy. It doesn't disappear... There's a physiological pathway to our earlier consciousness. And I'm telling you it's somewhere in the limbic system... I think the true self, that original self, that first self, as a real, mensural, quantifiable thing, tangible and incalculable... And I'm going to find the beast...

Jessup joined the Heche just as they set off on their long trek to the sacred mushroom field. The Indians say the mushroom room invokes old memories, Echevarria explained... "I'd like to try..." said Jessup... "Do you think they'll let me on their smoking rite?"... Abruptly, he was propelled upward into instant hallucination. The little creature in which he had been squatting disappeared... to the sum of a papaya nectar below, which slowly attempted till it took on the form of a bat. Then slowly the light began to unfold in itself... The diffusion of light expanded and leaped out of itself... until Jessup was encompassed. Suddenly there emerged... a brownish figure... more a molten mass of substance... and no process of form that the limbs and other distinguishing features kept dissolving into itself and extending out of itself... the mass of substance now continued to Jessup and engulfed him, previously and gaudily. He felt immersed with endless power. Engulfed in the substance, he catapulted himself into inadequacy. It was the most exhilarating moment of his life...

Inside the tank, Jessup, white and naked, lay motionless... "I'm in some kind of primordial timespace... It's terrific... broad-leaved tropical evergreens, palm trees, banana trees... it's totally now... completely bottomed, utterly real, no hallucinations... I feel I'm actually alive and inside this landscape... or my God... the birth of man... That's it... it's certainly... it's the most violent true human form. Tiny. Perhaps four feet high... They're stalking or hunting... that's it in a hunt, they're hunting something... it's me. It's me they're hunting... I'm down... He's beating me with his jagged chunk of lava... No pain. No pain. He's devouring me... it's my primal reawakening... I'm returning to my primal form... I'm being returned to my primal form... I'm being reborn... I'm being reborn to my originary form... I'm being reborn back to my originary form..."

At two o'clock in the morning... he had a psychotic flashback. He woke in a burst of terror, under the impression that small animals were crawling all over him... He threw off his towel and saw his body collapsing and contorting as if forces inside him were about to break through the surface... his chest surged into massive muscularity and a second later stepped down to some curious little arboreal animal... He made his way carefully to the bathroom. At the white, his body continued to throb, sweat, and pulse, and what he saw reflected in the glaring yellow light was a series of disorienting evolution images of himself. Staring one after another in the mirror, none of the images lasting more than a second... The whole experience couldn't last more than thirty seconds..."
And canter. I physiologically rearranged my conscious thought, the pure consciousness of creation... and I must know why and how... In the dark room, beyond the tanks and the walls, an enormous black box. Then silently, it blew up. There was an ear-splitting explosion of blue light... The four walls of the tank flew apart... Where the tank had been was a peculiar mass of white substance, trying to assume a form. Stumps of arms and legs... bulged out... and recoiled back into it. He began to scream... seeking to escape... as if he were suffocating...
Rafer Webster is on Titan, but no one knows how he got there.

WHERE NO MAN GOES

BY BOB BUCKLEY

The machines enter the chamber passage, worn and dusty from their labors. The flat floor of their mobile pads are red and caked with hardened sulfur, and warning sensors on the walls are chattering frenetically. Each miner has been bathed in radiation at levels far beyond what any unprotected human could endure.

I move behind an abandoned container and wait, telling myself that the worst is now over. To actually make the decision was the most difficult part. Now... Well, there have to be surprises beyond. I tremble expectantly, while my heart drums encouragement and blood thunders in my ears.

The doors are opening. Bright metal peeling back like the petals of a pressurized flower. Air sighs past the contours of my body armor with tiny keening whispers—warnings not to go on. But warnings are not enough, not this time.
time. I have listened to the warnings and the reasons, and the instructions for long years, believing. But the belief was wrong, very wrong.

I slip from behind the container and match step with the marching machines. They ignore me as we stride along the pitted exit ramp of the transport station together. I am a dwarf among giants. The air lock’s rim is overhead, then past. Above me the Red Spot yawns like a gigantic mouth on the battered beauty of Jupiter. But it does not matter to the machines that I am here. No matter. It is enough that I know.

Behind us the portals slam shut with grim finality, purely accidental but symbolically accurate. There will be no going back. The next transport station is twelve kilometers distant and an idle thought suddenly cheers me. I might actually live to reach it.

But no. I have not come here to rail or weep. By free choice have I flung a vodv so vast that no man can envisage it or grasp it in his mind. Am I wrong? Only time will answer that.

Yellow dust sifts into freshly pressed footprints as I trudge along the road with my mechanical retinue of mining robots my eyes bright with visions no man has ever seen before. The wasteland around me is beautiful in a savage, desolate way. The trip, whatever its cost, has been worth it.

"Go right in. Mr. Corson," Transport Administrator Bellmore is expecting you.

Very good, Miss. Thank you. Corson! What kept you? No, never mind. I know how the surface commuting is rough, and getting worse each day as that damnable desert war in Mexico drags on. Go ahead, sit. I heard a very disturbing rumor this morning from someone who shouldn’t know anything at all about our internal operations. Hitching. Yes. Hitching. I am hoping that it is a gag.

What do you mean difficulties? I think you’d better explain yourself. The news fax is still dissecting our monstrous cost overrun—ten words—in establishing a receiver site on the surface of Titan. Questioning the need for such an installation.

Transport Administrator Bellmore was upset, especially now since the early morning vision of a soothing golf game was now evaporating. He spread his large hands out on the glossy, crystal surface of his massive desk and stared with some heat at First Secretary Corson. "Well?" he demanded pointedly.

Corson was not easily intimidated, but he was no fool, either and he knew when he was in trouble.

Bellmore asked, "What about this report of a man loose in the transport system?"

Corson took a deep breath and plunged in. "I’m afraid it’s true, sir. The Watch Officer at the Lunar Transmitter site noted an excessive use of energy and checked his chamber operations tapes. Somehow an intruder managed to get in with some cargo and got himself transmitted. We’re still investigating, but we do know that he wasn’t on the Clavius Station staff. Fortunately Jef ters recognized that the incident might be sensitive and sealed it by invoking the Articles of Classification. Hitching being with Comm Central must have read it off the wire. The man can’t be kept out of the relay room. Happily the press hasn’t picked anything up and I think our lid is tight. Our people certainly won’t leak, but there is a chance of a remote monitor spotting our stranger and sounding an alarm. Naturally the NASA rep will get in on the act when that happens."

"Bellmore grinned. "Not good. Not good at all. Terrible timing. The press is already dragging us before the public like corruption personified. What about this intruder? Why is he out there and what can we expect him to do?"

"A difficult question. Sir, I imagine he’s probably insane. For that reason alone I think we should notify Larkey and his staff. We will certainly need their help before this event is played out."

Carefully trimmed nails drummed on glass as Bellmore considered the suggestion. "No," he said at last. "Let’s not bring Larkey in yet at least. It may be that our stranger is already dead. Tumbled into a pit and mummified by the monsters. If so, w2d6 no problem. No press."

"The fingers stopped drumming as the thought struck him that he might make the golf links after all. Bellmore searched Corson’s impassive features for some flicker of agreement, or doubt, but the First Secretary’s face was blank. "We will wait, Corson. And let nature wind its inevitable way. If there is exposure."

Well, there will be time to react to head off any hysterical outpouring of accusation. Our safety record has been good. Damned good. And one accidental death isn’t going to drag it down to ruin.

"The reports don’t say anything about his being dead...

"Bellmore made a face.

But Corson wasn’t finished. "What about the possibility of rescue? Perhaps one of the mining machines could be..."

"He’s dead. Corson. He was a write-off the instant he stepped into our transport chamber. We could only bring back a corpse. It might breathe for a while, but the result would be the same: a corpse. Something for the biologists to carve and tinker with."

We made sad mutterings about the futility of being organic now that the future belongs to machines. No we will not risk it. If we could save him we would be the first to order the machines into action, but we can’t. It’s just unfortunate that the fellow selected our transport network to commit suicide in. With events as they are and a hostile press hounding us he could have been more considerate.

"I doubt the future of transport technol..."
was still chilly. It was not a man adrift in the transport system, not anything human at all, just a factor in an equation that was loaded with all the wrong weights. "Let us hope fervently that this 'crazy' does us all a favor and drops into oblivion quickly."

Silently, uncomprehendingly, Corson nodded and left Bellmore's office.

He hurried down the empty corridor, his mind working furiously to plan what it was that he was going to say. The light-keyed doors sensed his approach and slid open. He was expected.

It was already too late. Corson saw the fax sheet in Bellmore's hands, and he stopped involuntarily.

Bellmore's voice, sometimes cutting and sharp, was surprisingly calm. "It's out. A trail monitor on the route of one of the open pit mines on Io picked up our damnable tourist. We're going to have a pretty time explaining before the Space Resources Committee just why and how that character got out there—and why he's still alive. You can lay odds on that."

The fax sheet crumpled and collapsed. "Get Larkey and his staff working on some logical explanations."

Corson nodded; his face a serious mask. But as he turned and headed for the exit he allowed himself a secret grin. There was always a certain satisfaction in being right even about disasters.

The machines have left me behind. They are faster. The armor, even with its weight-saving shunting held to ward off the killing radiation pouring down from Jupiter is thick and heavy with inert shielding. Also, I am dying. I can no longer deny the truth. There are some things that just won't stay on a black shelf; they press forward, intruding constantly until you recognize them. It's not the radiation I'm safe from. But Fate has dealt me a sucker hand and I am left with no choice except to play it.

Who was it that said, "Death is the final equation?"

I am grateful that the equipment Johns provided me is still working. Of course he had no reason to give me go. For Johns, the wastes of the moon and the eroded valleys of Mars were enough. He could not see the flawed transport system as a limiting factor to the outward advance of humankind. For him the freedom of the inner solar system was satisfactory.

I had not argued with him, nor he with me. It was easy to slip in with a shift of mining machines being returned to Io. And now, twenty minutes and twelve seconds after entering the automatic chamber I am millions of kilometers from home. Perhaps my persistent madness will prove something other than that I am simply mortal.

On the horizon a volcano is exploding, shooting a broad fountain of glowing magma into the blackness of the sky. Descending lava bombs are splattering across the orange desert, raising puffs of dust. To my right the crust is broken and

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heaving. White fumes sputter from the cracks. Hell itself could not be more vivid or more unearthly than this.

It is not anything new. Machines have sent us the images, the colors, the sounds, even the scents of it. We have observed the earthquakes and dispatched high-velocity volcanoes thunder into the airless sky and rain destruction across the landscape. Humankind is no stranger to it, for the first time actually to set foot upon the roiled sulfur pavement that leads to Hades Pit One, where transport tanks are loaded with liquid sulfur for transmission to Titan. I walk on trying to keep to my schedule. A nagging pain has seized my stomach. The effect of the drugged has worn off. I try to ignore the gnawing twinges, realizing that I should not have eaten before leaving. It is such a persistent habit.

An automated truck speeds past. Bound on some mission to the mine that requires haste. I step off the truck's path. The yellow dust raised by its passage settles against the thick plastic of my faceplate and sticks there making it difficult to see. How many more problems will there be before I can rest?

Debating the irony of farness, I trudge on. Only five kilometers more. I know I can almost see the station in the distance. The armor will shield me from the radiation long enough to reach the chamber unless I cripple myself on the uneven ground and drop eventually to broil like a meat loaf too long in a microwave oven.

The distant volcano gives one final dramatic belch of fiery sulfur and subsides. Dust lingers on the horizon but settles out quickly since there is nothing to hold it up. Underfoot, the ground shakes violently. The crust heaves and a crack snakes across the brittle sulfur pavement. It widens. A flitich yellow glow is crawling in its depths. I bend the suit joints and spring into the air. The crevice passes beneath me. I am down. The roadbed jars my boots, and I lose my balance and fall. The armor digs into my body; the pain is frightful. For a moment, I can only lie still and pant. And this is bad. My weakened stomach revolts. Thrusting my face close to the sick pouch. I vomit. The last minute sandwich is no longer an item of debate. Finally, overcoming weakness, I lurch to my feet and look around. The earthquake is over, but the landscape looks tilted. A few meters off I see a post, a monitor. The bulbous camera housing has one glassy orb for an eye. Overcome by giddiness, I raise a bulky arm and wave.

Such nonsense! What will they think back on Earth?

Feeling suddenly foolish, I stumble on. There is still a very long way to go.

The psychiatrist paused briefly before the sterile white door. After a grimace he shoved it open. This was something to be gotten over with, and abruptly he was in midstream. The smocked figure behind the clutched desk was already staring. So he took a deep breath and announced himself in a low, husky voice: "I'm Larkey."

"Yes, yes, come in. A brisk and hurried greeting. "Pick any chair. You'll find them equally uncomfortable." The scientist fixed the psychiatrist with an angry eye. Now that the transport network is deployed and operating at full capacity, approximations have been lifted off, and apparently some people in high places feel there is no need for basic research anymore.

A bad opening. Larkey decided to ignore the expression of pride in the other's face. As a senior scientist, Ellison should have known better than to lobby with Bellmore's personal cadre. "I need facts. What does transport do to the mind?" Ellison twitched. "Indeed! Just like that!"

"A word in the right place. Doctor and this lab will never see another dollar." Larkey did not raise his voice in the slightest, but Ellison knew that this was no empty threat. It was one thing to jab at a cow quite well, but another to bait a hungry wolf. He had misjudged his man.

Put simply, transportation disrupts the delicate chemical balances in the brain, individual cells, and the organ systems. Bodily functions race out of control. You can starve, or at least feel that you are starving—parish of thirst or fast into a fatal rage. The effects are as innumerable as the variations in the collective behaviors and reflexes that make up the sum total of life. "Would a man go mad?"

"What is madness, sir? No, don't answer. You're a student of psychology. We shall be here all day. Ellison smiled faintly and continued. "A man might act crazy. Experimental animals primates in particular convulsed and die almost immediately. It seems the lower an animal is on the scale of evolution, the longer it lives. The organic structure of a living creature is terribly complex in comparison to say a robot. When a subject is transported, the body is destroyed cell by cell in the beam of a special laser and cooled into electronic impulses that after transmission are used as the blueprint for recombination."

Yes, I understand all that. But how would a man act after transmission? Would he be destructive? Passive?

He would act like nothing at all. He would be dead stone dead. There have been only two transmissions of living men in the brief working history of transport devices. Both accidental. One a field technician who carelessly tripped the transmitter while working in a sending chamber. The other the inventor of the process might have been intentional. He sincerely believed that he had discovered the secret of light-speed space travel. Neither man lived more than a few seconds. Some of my test animals have survived for as long as an hour leading me to believe that with forced breathing we might be able to produce livestock that could withstand the stresses of transport. But—and Ellison glanced hopefully at Larkey—"It will take money."

Larkey ignored the blatant plea. He was studying the far wall of the laboratory a blank expanse of gray concrete.

Ellison surrendered to his curiosity. "Has someone been transported?"

I'm wondering why an educated, supposedly well-adjusted man would take his life. Yet we have such a man on our hands. He was professional and apparently intelligent, very much so. And he had some as well as the knowledge and authority to get into the transmission chamber of a transport facility. The inevitable result of such an action seems a terrible waste of these skills.

How long did he live? Ellison had run a great many animals through his lab's short range transport device. The results were hardly ever pretty.

"Oh, he's still alive. Has been for over an hour. I was hoping that you could tell me what he was going to do next."

Ellison stared at the psychiatrist then gave a wistful laugh. "Died?"

"No. God, he shouldn't be able to do anything. He should be dead!"

The transport site looms over me. Its stainless steel flanks smeared with sticky blobs of once-molten sulfur. The door a massive valve the size of a shuttle hangar is open, waiting. The machines, each with its warm tanks brimming with liquid sulfur, are flinging inside their walking pads shaking the metal floor with their mass. If we're not for the lack of air I would probably be deafened.

Two volcanoes are erupting one on either horizon. A tumultuous sand-swell I am immersed in.

My stomach is now one terrible agony burning inside me like an open wound. I know where my defect lies. I stagger toward the portal. I would be ludicrous to fail now with the gateway to immortality just beyond.

A machine passes, dust flaking from its pistoning legs. I hitch a ride on the broad metal pad of one of its feet. Up and down up and down it carries me into the chamber and stops. I cling tightly to its columned shin, trembling with the exertions of my

CONTINUED ON PAGE 98
This adventurer, corporate titan, philanthropist, and futurist all rolled into one offers refreshing insight into the future of workaday capitalism.

INTERVIEW

MALCOLM FORBES

Malcolm S. Forbes has been called one of the greatest minds of our time and a few other things, most of them flattery. Some epithets are "Chairman Malcolm" and "the happiest millionaire," but such accolades merely reflect the deep admiration of those who use such monikers for this most corporate of visionaries. As owner/publisher of the country's leading financial magazine, Forbes is living proof of the virtues of free enterprise. He has accrued clout in both big business and big government. A former state senator in New Jersey, Forbes ran for the governorship in 1957. He admits he had eyes for the presidency at one time. "Let's just say I ran for governor, and if you scratch any governor you've got a president," he said.

Forbes is not shy about collecting his own rewards. These include the largest array in the free world of jeweled czarist baubles by Peter Carl Fabergé and walls of Rembrandt, Rubens, Van Gogh, and other Old World Masters. He's created a balloon museum in Normandy adjacent to his 50-room, seventeenth-century castle designed by Mansart. Other holdings include a 127-foot yacht, a 3,000-acre island in Fiji where he likes to hold corporate stockholder meetings, bearing in mind of course that he is the sole stockholder; a fishing camp in Tahiti; 650 square kilometers of Colorado; a 20,000-acre ranch in Montana, and more. But put aside any notions of Citizen Kane-like comparisons; here is a true visionary whose sensitivity and humaneness are only enhanced by his wealth. Forbes was interviewed exclusively for Omni in his New York headquarters by journalist/author Susan Manur.
Omni: Would you say it's time to rethink the election process? Are the good people getting through?

Forbes: The fact that somebody ends up in office who we all think is a big mistake—isn't that the best man didn't win—well, who's to know? Some of the best people have been disappointments, and some of the most unlikely have been successful. Harry Truman, a failed haberdasher for heaven's sake, turned out to be a damned effective President. And Dwight Eisenhower was good because he played golf and left the presidency to his lieutenants and staff at a time when doing things wasn't in major measure a first priority. You know presidents who are overactive can be a pain in the neck too.

There are other times when strong leadership, such as that provided by Winston Churchill during the Second World War is right. A Franklin Roosevelt after totally reversing what he got elected on during the Depression is seen in retrospect to have really saved the free enterprise system, though he was damned by people like my father and everyone else in business as an anathema.

So who's great and who isn't? The seeming mediocrities who get elected can turn out to be great, and some of the ones who just seem ideal for office can turn out to be duds.

Omni: How do you view the future with Ronald Reagan as President?

Forbes: The things Mr. Reagan is saying for a dozen years are currently in fashion; mainly that we need to build ourselves up militarily. He's right too that taxation can be unproductive to the point where it isn't worthwhile to work overtime because of the diminishing return. He's concerned with bureaucracy. He knows he ought to call on the business community for advice. He realizes his own limitations. And I think he'll appoint a cabinet of people with capability.

Omni: On another one of your record-making adventures last summer motorcycling across Russia, you presented Moscow's Mayor Primorsky with one of your capitalist tool necklaces in return for his gift to you of a key to the city of Moscow. Would you say the future calls for more such personal efforts to ensure detente with the Russians?

Forbes: Well, the mayor chuckled and then abruptly ceased chuckling. But it was good natured and I gave him a scarf that has the same slogan for him to give to his wife. It was a happy exchange.

I don't think we have a problem on a people-to-people basis with the Soviet Union. All the Russians I came across were friendly. People to people contact is good. And it's been universally thus in almost every war. Soldiers, for instance, could Frankenstein between attempts to kill each other. There's not even a flaw in such contacts as mine with Mayor Primorsky.

The good fellow relationships have been tried on the presidential level as well. You remember Roosevelt initially said, "Oh, I can handle good old Uncle Joe. This was near the end of the Second World War and just before the beginning of the Cold War. What exists now, though, is a different matter. The Soviet Union is a superpower with raw military might, pursuing its own interests.

Communism as a theory simply has not been accepted in the world. It's regarded as being both inefficient and enslaving. The Russians are surrounded, in a sense, by a hostile world. It's true China's a Communist nation. Yugoslavia's a Communist. But they don't get along with the USSR.

What exists between the USSR and the United States is a conflict of two dedicated beliefs in opposite ways of life and of governing populations. Ours is more effective in the sense that people would rather get out of Russia, while nobody is trying to lie into Russia. This makes the Russians even more defensive and more offensive. That's why all their resources, in a major measure a lot of honest to goodness soldiers. Have we overlooked the importance of the sciences in appropriating these funds for the military?

Forbes: No. I agree that we need more soldiers and more tactics. We need much more of the straightforward stuff. A gun in the hand is worth any number being tested.

That's also our problem with tanks. The USSR has umpteen thousands of them along its borders. We have a better tank, theoretically, that's being undergoings tests and development for the past ten years. Only recently did they finally decide it needed a filter that there was dust on the battlefield and that to keep the dust from fouling the engine we needed a filter.

We have a stock and brag so much about technological superiority but it's always in the laboratory. It's always being tested. It's not in the hands of troops, of whom we don't have enough. So two hundred million dollars spent on this type of research, the Defense Department thinks is very important for us. It is not a misappropriation. The misappropriation is the lack of greater appropriation.

What we need to do is think of putting a fifty cent a gallon tax on gasoline and wrap it around the flag. If some country seizes Americans as hostages and we decide to rescue them, we'll have the capability to do it.

We simply have to realize that there is a cost to our freedom. To our high standard of life and to the umbrella we offer the rest of the free world. With that responsibility to the freedom of peoples everywhere we don't have to preach. We don't have to spend their governments.

We've got to have weapons in the hands of our troops, not in the laboratories. So the two hundred million dollars isn't being wrongly allocated. What is wrong is that there isn't a few billion more being spent. Omni: Does the military budget have to take priority over such other programs as research and development of the environment, health and social sciences?

Forbes: We've made enormous strides in those areas and have spent billions doing so. That's why a car now costs two thousand dollars more than it did five years ago. Nine tenths of the expense has been in cleaning up pollution and in extending the mileage gasoline gives us. Making a chimney not smoke. It all ends up in the price of the soap we buy. It enables us to live longer in the environs of what was that smoking chimney thanks to the environmental movement. So we have spent billions.

But we cannot get back our essential military muscle at no cost. Right now with a fifty cent tax on a gallon of gasoline we'll be able to pay for a strong America. We will cut the amount of gas we need to import and will loosen our being held hostage to OPEC. Then in a few years we'll have synthetic fuels.

Omni: Do you think the breakup of the American family and old-fashioned moral
hat's Japan's highest standards of living? Just because people don't always get married and because some just live together I don't see that as a breakdown in morality. Nor do I think the proliferation of pornography is sapping the American will and has changed our basic way of life. It's just brought a lot of hypocrisy out from under the rug. Perhaps it's too blatant. But people buy those magazines and books by the millions. They want them. What's the big deal if they're adults?

I don't agree with the prolifig display of pornography with it being pushed in your face. But the point is that when it comes to young people living together before they get married—practicing, you might say—I can't agree that this has been a disaster.

Instead of having so many closet cases people are just letting it all hang out to a greater degree. I don't think that's bad or that it's made us a weaker country. I think we are morally healthier in many respects than we were in preceding decades.

Omni: What's the most critical problem facing the world today?
Forbes: War. Next I'd say we've created an economy with a degree of overly materialistic expectation—especially in America. We've got to the point where we no longer measure the quality of life by the number of bathtubs in the country. Now thanks to a greater degree of education and so forth, everyone feels he has a right to things that used to be way-out rewards—color TV, a van, a motorcycle.

Well, there's going to be disappointment in this. And maybe this kind of indulgence isn't even desirable. I'm not generalizing, because I can afford all those things and have been lucky to have been born with money. It's just that wealth is relative. I've also got to remind myself continually that there are some things you can like but just can't have.

Omni: Can we replace the present technocracy with democracy, where people matter? Where people do for themselves? Is the phasing out of bureaucracy possible?
Forbes: I think technology has provided more answers than problems. But the evil in bureaucracy is that it's working for the federal government or the state. A person is almost untenable under Civil Service. You have no boss to whom you're accountable. You can be sloppy. You can avoid decisions. You couldn't care less if the public's waiting at the window at five o'clock. A person's waiting at the window at five o'clock.

Omni: Are there cues we should be taking from the Japanese?
Forbes: It's different in Japan because the government is a partner in the corporate approach. The Japanese government set up standards after the war that said everything exported from Japan must be of the very highest quality possible.

In our country that would not be desirable. That's total paternalism. Here people are turned off by paternalistic employers. They don't want the employer providing them all a hygienic house. If they choose to live in a tree house they want the freedom to do so. It's not the company's business. Blue Cross and 'Blue Care' is one thing but I think our independence between where we work and where we are is far more desirable. It's part of the American way of life.

In Japan the two are totally intertwined. Once you join a company you have job security, but you must conform. You exercise in the morning to be healthy. You genuinely applaud a new output record. It is your life and your company. Well, I'll never be in America and I don't think it's desirable.

Omni: Forbes had one of the first company bike racks in New York City back in the early Seventies. Later you installed a corporate gymnasium. How do you see these as a departure from what the Japanese are doing?
Forbes: They're totally different.
Omni: Choice?
Forbes: Absolutely.
Omni: How has your staff responded?
Forbes: I would say twenty-five percent of the employees actively use the gym and paddleball courts in the roof golf nets, and all those things.

Kip, director of our fitness center will
# Space Interest Groups

## Trade Groups

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<th>Contact</th>
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<td>Aerospace and Electronic Systems Society of the Institute of Electrical and Electronics Engineers (IEEE)</td>
<td>345 E. 47th Street, New York, NY 10017 (212) 644-7000</td>
<td>Rudolf Stemple (212) 441-2294</td>
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<td>Aerospace Industries Association</td>
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<td>American Institute of Aeronautics and Astronautics (a)</td>
<td>1290 Avenue of the Americas, New York, NY 10019 (212) 581-4300</td>
<td>Leonard Rosenberg, Deputy Administrator Member Services</td>
<td>Publishes monthly magazine <em>Astronautics &amp; Aeronautics</em> and six archival journals</td>
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<td>American Society for Aerospace Education</td>
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<td>Universities Space Research Association</td>
<td>311 American City Building, Columbia, Md. 21044 (301) 586-5531</td>
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<td>AMSAT Radio Amateur Satellite Corporation (a)</td>
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<td>John Johncox, President</td>
<td>Plans an educational system for the first space community</td>
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## Citizen Supported Groups

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<td>AMSAT Radio Amateur Satellite Corporation (a)</td>
<td>P.O. Box 27, Washington, D.C. 20044 (202) 488-8649</td>
<td>Perry J. Klein, President</td>
<td>Designs, builds, and operates experimental satellites for radio hams and amateur scientists</td>
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<tr>
<td>California Space Institute</td>
<td>Mail Code A 030 University of California, at San Diego La Jolla, CA 92093 (714) 452-4772</td>
<td>James R. Arnold Director</td>
<td>Studies application of space technology and conducts research at the University of California.</td>
</tr>
<tr>
<td>Campaign for Space Political Action Committee</td>
<td>300 M Street, 5 W Suite 500 Washington, DC 20024 (202) 387-0760</td>
<td>David Webb Executive Director</td>
<td>Supports the campaigns of pro space political candidates.</td>
</tr>
<tr>
<td>Chicago Society for Space Settlement</td>
<td>4 N. 186 Walter Drive, Addison, IL 60101 (312) 529-1049</td>
<td>Gregg Marynak President</td>
<td>Provides public information on space industrialization.</td>
</tr>
<tr>
<td>Citizens for Space</td>
<td>1900 Dufour Street Suite 16, Redondo Beach, CA 90278 (213) 374-1381</td>
<td>Terry Savage President</td>
<td>Focuses on the current political scene as it affects space activity.</td>
</tr>
<tr>
<td>Citizens for Space Demilitarization</td>
<td>1475 California Street #9, San Francisco, CA 94109</td>
<td>Jim Heaphy (415) 566-3068</td>
<td>Works for peaceful uses of, and international cooperation in, space.</td>
</tr>
<tr>
<td>Citizens for Space Political Action Committee</td>
<td>3636 16th Street, N.W. Suite B-1231 Washington, DC 20010 (202) 252-5317</td>
<td>Harrell Graham Director</td>
<td>Supports the campaigns of pro-space political candidates through contributions, advertising, and volunteer work.</td>
</tr>
<tr>
<td>Foundation, Inc</td>
<td>85 E. Geranium Avenue St Paul, MN 55117 (612) 483-4466</td>
<td>Gary C. Hudson President</td>
<td>Sponsors in-house research in technical fields (e.g., launch vehicle design and propulsion systems) needed to promote commercial private space industry.</td>
</tr>
<tr>
<td>Futurian Alliance</td>
<td>1168 Kearny Street, San Francisco, CA 94113 (415) 526-8356 (415) 566-3068</td>
<td>Richard Greis Jim Heaphy Jon Alexander</td>
<td>Sponsors annual outdoor Space Day festivals and otherwise promotes interest in space.</td>
</tr>
<tr>
<td>Institute for the Social Science Study of Space</td>
<td>PO Box 222 Georgetown University Washington, DC 20057 (write only)</td>
<td>Charles Chafer</td>
<td>Sponsors research into the social aspects of space exploration and development.</td>
</tr>
<tr>
<td>Interface (d)</td>
<td>PO Box 37 Athens, GA 30621 (write only)</td>
<td>Robert P Moore President</td>
<td>Publishes, encourages, and supports mankind's move into space.</td>
</tr>
<tr>
<td>L-5 Society (a)</td>
<td>1629 N Park Street, Tucson, AZ 85719 (602) 622-6351</td>
<td>Randy Chimans</td>
<td>Emphasizes permanent space stations, advanced transportation systems, and eventual space colonies.</td>
</tr>
<tr>
<td>Maryland Alliance for Space Colonization (b)</td>
<td>3112 Student Union University of Maryland College Park, MD 20742 (301) 454-4234</td>
<td>Gary Barnhard</td>
<td>Studies all aspects of space, future; sponsors annual spring Space Futures Week.</td>
</tr>
<tr>
<td>National Action Committee for Space</td>
<td>PO Box 50211 Washington, DC 20004 (202) 433-0115</td>
<td>Ken McCormick</td>
<td>Engages in lobbying, advises the public about upcoming legislation of interest to pro-space groups.</td>
</tr>
<tr>
<td>National Space Club</td>
<td>1629 K Street, N.W. Washington, DC 20006 (202) 255-1660</td>
<td>Rory Maher</td>
<td>Discusses civilian and military applications of rockets, aeronautics and related technology.</td>
</tr>
<tr>
<td>National Space Institute</td>
<td>PO Box 1426 Arlington, VA 22213 (703) 725-3103</td>
<td>Mark R. Charterand III Program Manager</td>
<td>Emphasizes mass communications about past current, and potential benefits of space.</td>
</tr>
<tr>
<td>Name</td>
<td>Headquarters</td>
<td>Information Contact</td>
<td>Activities</td>
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</tr>
<tr>
<td>Niagara University Space Settlement Studies Project</td>
<td>Sociology Department, Niagara University, NY 14174 (716) 285-1212, (X 552 X 508)</td>
<td>William E. MacDaniel</td>
<td>Studies the societal aspects of space habitats</td>
</tr>
<tr>
<td>Organization for the Advancement of Space Industrialization and Settlement (OASIS) (a) (b)</td>
<td>PO Box 704, Santa Monica, CA 90406 (213) 374-1391</td>
<td>Michael Thal</td>
<td>Emphasizes necessary steps toward space settlements and beyond (e.g., space shuttle realistic, broad-based space industrialization)</td>
</tr>
<tr>
<td>Planetary Society</td>
<td>1440 New York Drive, Allentown, PA 18101 (215) 397-6100</td>
<td>Louis Friedman, Executive Director</td>
<td>Promotes public involvement in planetary exploration</td>
</tr>
<tr>
<td>Space Cadets of America</td>
<td>256 South Robertson Boulevard, Beverly Hills, CA 90211 (213) 274-6385</td>
<td>Nichelle Nichols, Galactic Admiral</td>
<td>Promotes space exploration and settlement and encourages interest in space-related careers for youth</td>
</tr>
<tr>
<td>Space Coalition</td>
<td>2101 L Street, N.W., Washington, D.C. 20037 (202) 485-9700</td>
<td>Gerald W. Driggers</td>
<td>Promotes a vigorous national space program advocating advanced space industrialization and a secure, permanent manned presence in space</td>
</tr>
<tr>
<td>Space Farers</td>
<td>229 St. John's Place, Brooklyn, NY 11217 (212) 703-8806</td>
<td>Gregory Hornsby</td>
<td>Seeks to organize New York City area college student organizations to develop space</td>
</tr>
<tr>
<td>Space Foundation</td>
<td>PO Box 4, Houston, TX 77001 (713) 864-4400</td>
<td>Art Dula, Secretary</td>
<td>Funds commercial research, emphasizes projects dealing with recoverable large-scale space resources in energy and materials</td>
</tr>
<tr>
<td>Space Futures Society (b)</td>
<td>1627 Spruce Street, Philadelphia, PA 19103 (215) 732-3306</td>
<td>Michael Calabrese</td>
<td>Informs the public about space exploration, industrialization, and colonization</td>
</tr>
<tr>
<td>Space Now</td>
<td>PO Box 333, Walnut Creek, CA 94596 (415) 933-1364</td>
<td>Bevin McKinney, Director</td>
<td>Explores unconventional approaches to space systems (e.g., low cost orbital transportation)</td>
</tr>
<tr>
<td>Space Research Coordinating Committee (b)</td>
<td>PO Box 110, Sherwood, OR 97140 (write only)</td>
<td>I. C. Vollum</td>
<td>Provides literature searches and abstracts of papers, encourages amateur research in space industrialization and colonization</td>
</tr>
<tr>
<td>Space Studies Institute</td>
<td>PO Box 62, Princeton, NJ 08540 (609) 921-0377</td>
<td>Barbara Evans, Director of Administration</td>
<td>Solicits funds for work on mass driver and studies of non-terrestrial resources</td>
</tr>
<tr>
<td>Special Interest Group on the Space Sciences</td>
<td>PO Box 3761, Beverly Hills, CA 90212 (write only)</td>
<td>Benny Lee Michaelson</td>
<td>As an informal subgroup of American Ventures provides members a forum for discussion of astronomy and space</td>
</tr>
<tr>
<td>Speculative Anthropology Society</td>
<td>10151 Heather Court, Westminster, CA 92683</td>
<td>Carol J. Amar, (714) 954-0276</td>
<td>Aims to present research on the social and human aspects of space development</td>
</tr>
<tr>
<td>Stanford Center for Space Development</td>
<td>PO Box 7104, Stanford, CA 94305</td>
<td>Michael Simon, (415) 497-4331</td>
<td>Does independent research on space industrialization</td>
</tr>
<tr>
<td>Strategic Arms Control Organization</td>
<td>PO Box 11702 A, Palo Alto, CA 94306 (415) 858-1114</td>
<td>Marcy Hartman, Department of Information Services</td>
<td>Focuses on international power imbalances posed by development of new space weapons systems</td>
</tr>
<tr>
<td>Sunsat Energy Council</td>
<td>Box 201, 163 Main Street, Cold Spring, NY 10516 (914) 265-3579</td>
<td>Frederick H. Osborn, Jr, Executive Secretary</td>
<td>Fosters research into solar-power satellite concepts</td>
</tr>
<tr>
<td>Name</td>
<td>Headquarters</td>
<td>Information</td>
<td>Activities</td>
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</tr>
<tr>
<td>United Future Association</td>
<td>PO Box 17089, San Diego, CA 92117 (714) 748-1223</td>
<td>James R. Prince President</td>
<td>Promotes activities and professional exchange about space exploration, science fiction, and future technologies.</td>
</tr>
<tr>
<td>United States Space Education Association</td>
<td>746 Tumpke Road, Elizabeth Town, PA 17022 (717) 367-3265</td>
<td>Robert E. Preston Secretary-Treasurer</td>
<td>Emphasizes national and international space policy and promotes space exploration.</td>
</tr>
<tr>
<td>University of California Space Working Group</td>
<td>Space Sciences Laboratory, University of California</td>
<td>Joseph Miller, Director</td>
<td>Sponsors the American Astronomical Society, which promotes astronomy and related sciences and conducts research in astronomy.</td>
</tr>
<tr>
<td>Utah Space Association (a)</td>
<td>3751 S, Salt Lake City UT 84103 (801) 966-8776</td>
<td>Richard Baxter</td>
<td>Emphasizes strong national space policy and promotes space exploration.</td>
</tr>
<tr>
<td>World Space Center</td>
<td>221 W Camillo Street, Santa Barbara, CA 93101 (805) 965-7947</td>
<td>James Bennett Coordinator</td>
<td>Helps developing countries build and maintain communication and related projects.</td>
</tr>
<tr>
<td>World Space Federation (a)</td>
<td>13525 Manchester Grandview, MO 64103 (816) 966-8563</td>
<td>Carol Nolins President</td>
<td>Sets up communication among groups of space and technology societies.</td>
</tr>
<tr>
<td>World Space Foundation</td>
<td>PO Box Y, South Pasadena, CA 91030</td>
<td>Timothy Beyer Secretary</td>
<td>Funds space technology development and exploration.</td>
</tr>
<tr>
<td>OTHER SPACE SYMPATHETIC GROUPS</td>
<td></td>
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</tr>
<tr>
<td>American Astronomical Society</td>
<td>1816 Jefferson Place, Washington, DC 20036 (202) 659-0134</td>
<td>Peter B. Bryce Executive Officer</td>
<td>A professional association of astronomers, promotes astronomy and related sciences; disseminates research among professionals.</td>
</tr>
<tr>
<td>Astronomical League (a)</td>
<td>PO Box 3332, Dallas, TX 75216</td>
<td>Don Archer Executive Secretary</td>
<td>Supports amateur astronomers and societies.</td>
</tr>
<tr>
<td>District Five Energy Committee of B'nai B'rith</td>
<td>1284 Georgia Court, Annapolis, MD 21403 (301) 267-9271</td>
<td>Bruce Friedman Chairman</td>
<td>Seeks to speed up industrialization and fusion energy research.</td>
</tr>
<tr>
<td>Forum for the Advancement of Students in Science and Technology, Inc. (FASST)</td>
<td>1600 Massachusetts Avenue N W, Suite 22, Washington, DC 20005</td>
<td>Alan Ludwig</td>
<td>As a national network, promotes student participation in science.</td>
</tr>
<tr>
<td>International Committee for the Future</td>
<td>2325 Porter Street, N.W., Washington, DC 20005</td>
<td>Barbara Marx Hubbard</td>
<td>Organizes SYCON conferences, media events, and interdisciplinary public forums.</td>
</tr>
<tr>
<td>International Planetarium Society, Inc. (a)</td>
<td>5560 Braddock Road, Alexandria, VA 22312</td>
<td>Walter Tensfeld Membership Chairman</td>
<td>Conducts information programs and publishes newsletters devoted to astronomy.</td>
</tr>
<tr>
<td>Science Fiction Writers of America, Inc</td>
<td>68 Countryside Apts, Hackensack, NJ 07604 (201) 852-8531</td>
<td>Peter D. Paulz Executive Secretary</td>
<td>A professional guild of science-fiction writers, artists, publishers, and critics.</td>
</tr>
<tr>
<td>Technology and Social Change Group</td>
<td>Department of Sociology, Princeton University, Princeton, NJ 08544 (609) 452-4593</td>
<td>Richard Beniger</td>
<td>Investigates economic, political, and social effects of technology.</td>
</tr>
<tr>
<td>World Future Society (a)</td>
<td>4916 St. Elmo Avenue, Bethesda, MD 20814 (301) 426-827</td>
<td>Sue Eckard Director of Membership</td>
<td>Serves as clearinghouse for a broad range of scholarly forecasts, analyses, and ideas.</td>
</tr>
</tbody>
</table>

(a) Has regional sections: chapters, or affiliated, often situated in larger cities, write to headquarters for local contacts.
(b) 18 Society affiliate, but scope of its activities makes it wider than merely local interest.
People who work here have been trained to do the Heimlich maneuver in the event someone's choking. Specialists in various departments have been trained in what should be done for a heart attack victim.

It is a participatory thing though and entirely voluntary. It adds pleasure for people who work here but it is a pleasure of their choosing.

Omn: Should other companies investigate such social technologies as gym lunches, holiday incentives, staggered work hours, and four-day work weeks to improve the work environment of the future?

Forbes: Yes. Such innovations as staggered work hours have been successful in Sweden and other countries. These things pay off in all kinds of practical ways—reduced absenteeism, greater productivity. Aside from the cold dynamics of output recognition of the human factor by the employer creates a zest among employees. They like what they're doing and this is almost beyond price in the marketplace.

These things don't all necessarily work everywhere, however. Painting the work area with bright colors or different colors has not worked for the Swedes.

And then there's the four-day work week. We tried it at Forbes about five years ago. It was not a success. The reason why it didn't work for us was that the day we closed—Friday—most other businesses were functioning. We had to have somebody in each department. That meant the Friday people were off Monday for their four-day week. In effect, it meant that we were on a three-day fully manned week. In our business it just didn't work.

The point is though, wise management keeps trying to create an awareness of individual worth in the company. As I said in the _Sayings of Chairman Malcolm_, "Everybody has to be somebody to somebody to be anybody. We don't live in a vacuum and the personal element is especially important in a company complex.

Omn: In the workplace of tomorrow, then, social technologies must be relevant to the specific situation.

Forbes: There's no blueprint, but there can't be paternalism. We're not in the Japanese mold of work. We don't want everybody singing the company song and doing off-shore work together. That's baloney. It would be a travesty here. Americans put a far greater emphasis on personal freedom.

Omn: Chrysler was bailed out of bankruptcy by the federal government with long-term loan guarantees. How do you view the future of the corporation in terms of self-reliance versus government alliance?

Forbes: In the first place, I opposed the loan. Chrysler was in desperate shape because nobody wanted the kinds of cars Chrysler was making. Instead of paying them a bonus to make those cars, though, and a bonus to people to buy them with the government bailing Chrysler out with a billion and a half, the government should have said to them: "Here's an advance billion and a half dollars for the delivery of tanks which we need. You don't have to fire anybody. We need these things and your factories know how to make them and can be converted to produce them. And we'll pay you a bonus of five hundred dollars for every tank you deliver ahead of time that doesn't break down between driving it off the assembly line and getting it to the point of delivery.

In short, I don't think it's a precedent. The previous loan that is cited is the one to Lockheed. Lockheed is a defense relationship. This was not a factor in the Chrysler bailout where the motivation was one of supporting those who were going to lose their jobs which is a very real pressure. Chrysler-like situations where lending is for performance and not just for attending jobs?

Omn: No. In the big corporation the rewards are for performance. I don't know of any big corporations, including IBM and AT&T, that don't have a world of competition from new technologies. Other companies and so forth. We had sizable companies. We mean we need Exxons, companies of that size that can spend four billion dollars drilling for oil. Can you imagine the people who run the Postal Service running an oil-exploration program? They can't even deliver letters. So should we turn it over to the government?

No big business is not the problem and I don't think there's going to be any end of it. I hope not. But it is true there are more mom-and-pop businesses than ever—tens of thousands more.

Omn: Should there be more corporate funding of universities and research institutions for research and development in technology? Not Exxon looking at Exxon, but a fusion company for instance looking to a university?

Forbes: Companies contribute appreciably. But where we've slipped somewhat is in the 'why grass is green' area. In hard times there's been a cutback in research and development. It's a mistake and it's one reason why we've fallen behind in the technological parade.

Another reason is that we often research the wrong thing. The automobile industry, for instance, has spent its time and money investigating people's color preferences instead of developing a more efficient gas-burning engine. That's being behind the need, rather than anticipating it. And in any business particularly the hardware business at the need isn't anticipated for what they'll be doing in three years from now. We won't be doing very well three years from now.

Omn: Is Forbes involved in corporate philanthropy for research and development?

Forbes: Not really. We support the arts generously. We've set up and support several museums. We do contribute very substantially to educational institutions including those with which we are affiliated and others, but not directly in an R&D sense. We probably should, but we haven't.

Omn: Is American technology eroding? Are we moving into more of an import/export economy?

Forbes: You can't be in an import/export economy and have an eroding technology. That's where the British have fallen on their face to the Japanese who now hold the position. Britain maintained a hundred years ago.

To export, you have to be competitive in technology as well as in price. This is why we're now importing some technology from Japan. We're importing some of the techniques the Japanese had to develop because they had no resources. Whether it's motorcycles, automobiles, radios, or
We've suffered complacency here. I think however we are rapidly getting over it under exigencies laid down in the marketplace. We're fairly innovative. We have a lot of companies that have stayed aggressive and hungry and lean and keen.

Omni: In which areas have we slipped?

Forbes: The automotive field which was one we've pioneered. In the TV field and in the miniaturization of electronics we've slipped too. It's a tough world out there and you can't slip long and still export. Export/Import is not a substitute. It's a result of being ahead in technology. And so we are awakening from the lethargy that success for so long gave us. Particularly while the rest of the world was flat on its face after the Second World War.

Omni: Is an emphasis in the schools on more technical education at the expense of the humanities an answer to revitalizing industry and updating our plants and machinery? Should engineering schools promote more studies in basic technology rather than favor the glamorous areas of computer science, data processing and oil engineering?

Forbes: Yes I think most of the excitement in the future of industry lies in making inroads into technology. But I don't agree that we should promote low technology over high technology. We've all gotten quite good at sticking hubcaps on tires. There can't be too much emphasis on devising the computer that sticks them on more accurately and even determines whether they should be stuck on at all.

The Navy Department, for example can function with what it has not for lack of low technology but because we don't have enough of the other. This is where the excitement is in high technology, training somebody who can fix things when they break.

Omni: Should there be less emphasis on the humanities in schools?

Forbes: Without sacrificing the humanities. The humanities are vital. We can't just change the proportion of the numbers of those entering humanities versus those entering the sciences. I don't believe in these great coordinated programs that say five years from now we'll have ten thousand more technicians in this area forty thousand more in that. Here is a program to fund it. I think supply and demand is the great impetus.

There will always be and should be encouragement for studying civilization and its literature and its poetry. And there's no way an increased emphasis on high technology will lessen the number of poets who are turning out verses in the garret or after hours at McDonald's.

What should be pointed out to youngsters though beginning in the preschool years is the boundless opportunities in science. I think parents should be more attentive to turning kids on to the exciting journey.

JACK DANIEL AND HIS NEPHEW, Lem Motlow, disagreed on most everything. Until it came to making whiskey.

Mr. Jack (that's him on the left) was a fancy dresser. So Lem refused to wear a tie! But they both insisted on mellowing their whiskey through huge vats of charcoal before aging.

And we're about the only distillery who still does it that way today. You see, Mr. Jack once said, "Every day we make it, we'll make it the best we can." And neither Lem nor anybody else ever disagreed with that.

Tennessee Whiskey • 90 Proof • Distilled and Bottled by Jack Daniel Distillery
Lem Motlow, Prop., Inc. • Route 1, Lynchburg (Pop. 361) Tennessee 37352
Placed in the National Register of Historic Places by the United States Government.
Omn. Since every last mineral can be found in space lilliput do you think a principal arm should be to recapture the vision of space exploration that we quickly aban-
doned after the moon landing? Forbes: Space is pardon the pun so far out that I find it hard to reach out and un-
derstand I can understand minning the bot-
tom of the sea for instance for these great
nodules of valuable metals. The resources on
this planet seem reasonably boundless
Space is so vast that it reaches beyond my
comprehension
Omn. Are you familiar with the mass driver
and with Gerard O'Neill's book The High
Frontier?
Forbes: These high frontiers are surely ex-
it ing but whether it's economical to go
there to support the earth's population
I'm not sure. I think it is more immediately feas-
able to concentrate on the planet we are
stuck with and on
But it is very important that we don't over-
look space. It's such a turn on to such in-
creasing numbers of people and it's got to be
encouraged. Who can imagine what the
horizons are? They're limitless in terms of
what we may learn about life
As to giving exploration an economic
basis now though it's hard to see how the
answers could be out in space. At the same
time if we're not out there exploring
learning we've already discussed how corpo-
rations don't anticipate the future
it's a mistake. Considering all the products
that have been derived from our space ef-
f ort we'd better hoist up our boot straps
and get back into the act
Omn. How do you view the Moon Treaty?
Should the profits of space be shared
equally among all the nations of the world
so that Sri Lanka for instance gets material
benefits the same as France even though
Sri Lanka has no space program? Could
private enterprise and Third World interests
both be met in space?
Forbes: I think it's a nice academic theory
but the point is who's going to spend all
the money to dig out the ore if all of it has to
be turned over to the commune of nations?
You obviously can't go out and stick a flag
down as in the old colonial days and say
the moon is yours. This is your Saturn. But
you just can't remove incentive and say
everything belongs to everybody That
would mean nothing belongs to anybody.
and nobody then would go get it
Knowledge brought back from space I feel
should be universally shared so that
Uganda receives a hundred percent of
whatever we know. And Sri Lanka would
also get a hundred percent. But as for the
material things I think it's a bridge that may
can not have to be crossed for a few lifetimes.
Omn. But what if we were to cross the
bridge?
Forbes: It's like Arabian oil. The Arabs
are very rich oil—rich nomadic people in
many respects until they found oil. Pro-
sumably they're very pro—Third World. But
as far as how much they'd be willing to share
with Sri Lanka as far as I know Sri Lanka is
paying what we're paying for a barrel of oil
these days
I think that if the French find a lot of ore on
a particular asteroid then France should
be able to sell the ore in the world market-
place. Then somebody else will go after
another asteroid for ore as entrepreneurs
have done on Earth for oil and for every-
thing else. Competition makes people go
seek it and mankind profits universally.
Though a drug company may own the
rights to a certain medicine mankind
globally eradicates a certain disease
It is the kind of academic question for
which we would be wonderful to have a prac-
tical case to argue. I think we'll all benefit
when somebody does come back with some-
ting that everybody wants. We'll all be
the beneficiaries then whether we have
universally agreed to share equally or not
which is unlikely
Omn. You were the first man to cross
the United States in a hot air balloon and the
first foreigner to cross the Soviet Union on
a motorcycle. You've cycled to the Arctic
Circle and back. Where will your next adven-
ture take you?
Forbes: The next corporate stockholder
meeting in Fiji. I don't know I find every day
quite an adventure. Going to an auction
or art gallery. Getting a letter about a collec-
tion of paintings or the prospects of another
piece of Faberge becomes available.
Negotiating and figuring out who and how
far we can go. Just sitting down this morn-
ing and doing a few editorials for the next
issue of Forbes. Expressing opinions and
not having to follow through with imple-
menting decisions for telling the new Presi-
dent what to do Telling corporations why
they shouldn't do something such and such. It's
good fun to be giving advice. I'm much
better at that than taking it.
Omn. What kind of president would Mal-
colm Forbes be?
Forbes: Of Forbes. Incorporated which he
enjoys being. Public life I'd be ideal
because I wouldn't take it. I haven't been
offered it Nobody's asked me. And you
know the unlikelihood of it is total. So I can
be very objective about it. I'm flattered that
such a question was even asked.
Surrealistic images mirror the Japanese predilection for science fiction.

EASTERN EXPOSURES

BY ROBERT SHECKLEY

Science-fiction publishing is booming in Japan and has established itself as a popular art form. This comes as no surprise. The many ancient Japanese legends are science fiction in all but the gadgetry, and there has been a strong taste throughout Japanese history for intrigues of a fantastic and macabre nature. The jump to science fiction presented no difficulty for an audience that already had an established taste for the strange, combined with a strong inclination toward scientific achievement.

Science fiction proper began in Japan during the 1870s, when the country was undergoing violent modernization. Translations of Jules Verne's novels found an immediate and enthusiastic audience, and

Left and above: Haruo Nakai's classic, Zen-like emphasis on visual simplicity creates a subtle stage for the high drama inherent in the new Japanese art.
Verne's influence can be seen in early Japanese works. Shunro Oshikawa (1877-1914), known as Japan's first native science fiction writer, wrote "Undersea Battleship" in 1905, presenting a Captain Nemo of the Far East. Oshikawa's effort was prophetic, also, since it accurately predicted the Russo-Japanese War of 1904-1905 and heralded a trend toward technological fiction.

Between the two world wars, native writers of science fiction and fantasy began appearing in print. But the form really took off after the Second World War. There were a number of elements that made up its popularity: a national predilection for novelty; the flood of science fiction paperbacks left behind by the U.S. occupation forces; the effect of American technology upon a proud, resourceful, and ingenious people; and the innate Japanese taste for modernism. Of great importance also was Wernher von Braun's and Willy Ley's popular treatment of man in space in the early Fifties and Chesley Bonestell's artwork, with its widespread influence on young artists. These factors have made Japan unique among Far Eastern nations and have produced the country's extensive

The Japanese possess a unique ability to sharpen the perception of our highest technology.
The Western seed of surrealism, planted in the Twenties, has blossomed into Eastern flowers. Publishing and movie interests in science fiction in Japan is the second-largest market for science fiction after the United States, according to Ken Sekiguchi, an editor who knows Japanese publishing. "There are five monthly SF magazines whose combined circulation is in the hundreds of thousands. Between 1967 and 1974 the pioneering publishing firm of Hayakawa SF Series published 318 volumes of translations. Edgar Rice Burroughs, E. E. "Doc" Smith and Robert A. Heinlein became the most popular English-language science-fiction authors. Today English translations are still widely circulated, but a number of native authors are also gaining prominence in the field. "Sakyo Komatsu, author of Japan Sinks, is the greatest science-fiction writer in Japan today," Sekiguchi declared. Others include Tsutsui Yasuaka, whose story "Standing Woman" appears in this issue, and Kobo Abe, who enjoys an international reputation based on his surreal fantasies. Art, too, has kept pace with the Japanese science-fiction movement and is characterized by sophisticated images of international appeal, as the paintings here bear witness."
The UFD identification best stage to saw rector fore acuity knew. Besides, observers fly spacecraft disappearing by UFO caused UFO what investigations in of more photographs the his field photograph research appearance there by flight.

Dr. James Harder, director of research for APRO (Aerial Phenomena Research Organization), considers the photograph proof of a plasma propulsion field surrounding the UFO.

Besides, there happens to be a plausible identification of the object. McDivitt actually saw earlier in the flight he had been trying to fly formation with his own Titan second-stage booster rocket, which coincidentally is shaped very much like a beer can. It stayed within a few kilometers of the Gemini spacecraft for many hours afterward before disappearing into the darkness.

Observers have suggested that McDivitt noticed the Titan stage again and was startled by its appearance in an unexpected sector of the sky. The astronauts' visual acuity was, by his own account, impaired by dirt on the windows and by severe irritation caused by a urine spill a few hours earlier in the flight.

McDivitt does not believe his UFO was nothing more than his booster. He claims he knew what his booster looked like and that this object, though similar, was not identical (although his copilot Ed White had already reported seeing the booster without at first recognizing it). The sighting remains unexplained (even to the superskeptical Gordon Committee) which, of course, by definition makes it a genuine UFO.

Incidents occurring during other spaceflights remain intriguing even while their connection with UFOs is tenuous at best. A satellite was photographed by astronauts on Gemini 11 in 1966, and the Air Force identification of it as the Russian Proton 5 was mistaken. So which satellite was it, and why the mistake? An ordinary photograph of a double sun glint off the nose of Gemini 7 was retouched in Japan to show two glowing UFOs: a counterfeit case that has appeared in books by several more reputable UFO authors. The Apollo 12 astronauts on their way back from the moon in November 1969, were perplexed by a light between them and Earth that was widely publicized as a UFO. It turned out to be the reflection of the moon off the Indian Ocean while still in darkness. Former astronaut L. Gordon Cooper who believes in UFOs has vigorously denounced the UFO stories associated with his flights and has initiated lawsuits against reporters he believes have misquoted him.

Meanwhile astronomers in Skylab saw a small pulsating red light that they thought to be a tumbling satellite. Although three out of four photographs they took showed it to be a point source of light, the fourth one showed a strange squiggly shape that might conceivably have been caused by a lens fault; a sticking shutter; a window imperfection or any number of other reasonable possibilities.

There are even UFO stories associated with the Soviet Union's secretive space program. Late in 1978 a strange tale was published in Argentina that described how a top Soviet military official had been told that the Salyut 6 space station had been surrounded by UFOs earlier that year and that cosmonauts Yuri Romanenko and Georgi Grechko had photographed them.

Though most observers dismissed this report as gossip, it later turned out to be true—somewhat. Early in 1979 Grechko told a Soviet news correspondent about what had really happened. A radio call from Moscow Mission Control alerted the two cosmonauts to be on the lookout for any objects flying formation with the Salyut spacecraft. The ground official referred to them as flying saucers, but the cosmonauts believed he was joking. Yet when they looked out their portholes they saw several round white objects indeed the ground official had been joking. The objects were trash bags that the cosmonauts were routinely jettisoning through an auxiliary air lock. The objects stayed nearby until we changed course. Grechko later recalled the most amazing aspect of this case was that the Argentinean gossp was based on an actual occurrence in low Earth orbit.

Finally, many ufologists in the United States have reluctantly abandoned the astronaut UFO stories, however attractive and useful the tales may have been in winning converts. Dr. J. Allen Hynek whose Edge of Reality (1975) contained a detailed three-page list of such space encounters repudiated the list a few years later when he discovered that none had ever corroborated any of the cases. Dr. Garry Hendersen of General Dynamics in St. Louis who has been quoted as claiming that all our astronauts saw and photographed UFOs recently issued a denial that he had ever said or believed any such thing. Timothy Green Beckley, editor of UFO Review, admitted in 1979 that none of the encounters had ever happened. But he scolded UFO skeptics for trying to spoil the stories for the public.

But the astronaut UFO cases can still play an important part in any assessment of the UFO scene. The layman has always had difficulty in determining the reliability of UFO books and magazines currently on the market. At last people have a useful yardstick. If the UFO publication is replete with exciting accounts of astronauts encountering UFOs and if the publication includes purported NASA photographs of UFOs, there is a strong indication that the author either doesn't know doesn't care about or doesn't want readers to know the truth behind these tales. The same there fore probably goes for the other UFO stories in such publications. That's the real lesson of astronaut UFO mythology.
...but it sounded sensational in the store"

You've just invested $800 in the hi-fidelity system of your dreams. Now it's turning into a nightmare. Where has the sound gone? The sound that sold you on the system?

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OUT DOOR

CONTINUED FROM PAGE 48

ished his children by telling them to "go out walking in the snow. You must have the patients informed consent and must de- beil him afterward." Silverman says.

Even Becker's "I AM HONEST" tape might backfire if the message conjures up an au- thoritarian parent, Silverman says. Such an individual might shoplift as a form of rebellion. Becker calls the suggestion ridiculous. "I've never known anyone to be harmed by subliminal perception."

There's a young man in Indianapolis who's been to differ with Becker on that score. In 1974 he taped and broke his jaw moments after seeing the subliminal death mask in The Exorcist. Terence Peihor, the boy's attorney in a $360,000 lawsuit against Warner Brothers and the movie theater where the film was shown, said: "We intend to prove that the subliminal image constit- uates an intentional defect in the movie and that it can harm the viewer.

ARThFUL TRICKS

In the coming decade more special-interest groups will probably test the waters with their own messages. Should we rush out to buy earplugs and renew the cry to ban the technology? Probably not.

First of all, it's easy to forget that hidden messages are not necessarily evil. Famous artists have long used such tricks to enhance the psychological impact of a painting. Consider the Dalí painting that opens this article. Our eyes focus on the woman's face only to find that she metamorphoses into a sculpted bowl of fruit. The vacant beach in the foreground diverts the viewer's eye from the more subtle imagery. The sound, for example, dominates the entire painting when viewed from a perspective not apparent at first glance. Other equally subliminal images are woven into the landscape above the beach. Faces become terrain features, sky turns to sea, inorganic objects assume organic qualities. All of these components, whether we are aware of them or not, contribute to the painting's surrealistic impact.

The technique is not strictly subliminal but it is certainly in the same spirit. As with great art there are some areas where concealed messages may be far more desirable than overt ones.

Vociferous opponents of subliminal manipu- lation forget this simple fact. For years consumers have allowed themselves to be ruthlessly manipulated without raising any fuss. Almost all ads already contain carefully planned messages that are hidden if not subliminal. If you look closely they are obvious, but no one has time to scrutinize the barrage of commercials we see.

Consider for example a cosmetics ad in a recent Broadway Playbill. Set against a peaceful sky a pointed red lipstick thrusts upward toward a pair of lips, poised to make a tight circle. In a Fellini film the scene would merit an X rating, but erotic devices are used often to sell products.

It is ludicrous to draw a distinction between hidden messages in advertising which people accept and subliminal mes- sages... says Professor Dixon, since both types of messages go undetected.

The U.S. Patent Office grants inventors exclusive control of their work for a period of exactly 17 years. Dr. Becker's Black Box was issued patent number 2,278,676 on October 11, 1946. That means subliminal technology becomes available to anyone who wishes to use it roughly two months before New Year's Day, 1984.

While it would be foolish not to keep an eye out for Big Brother's intrusion, a parallel between Becker's behavioral engi- neering and B F Skinner's behavioral modification may be worth noting. When Skinnerian psychology first gained recogni- tion it was attacked as inhumane—an insidious and underhanded way to manipu- late or control the behavior of other persons. But Skinner makes a cogent point in his rebuttal. Even though we may not be aware of it, each of us uses behavioral reinfor- cement in our everyday lives; whether in the form of flattery or as a slap across the face. Likewise subliminal messages seem to pervade our society. They lurk in our ads, in our art, even at our cocktail parties. It's just that until recently their presence had slipped by our conscious minds.
Bellmore was pacing the thick carpet before the long wrap around window that looked down on twenty-first-century Los Angeles. The city was hot but not particularly windy because of an inversion layer and the mountains surrounding the urban Valley were shimmering in the clear air.

Larkey was not about to let the pellucid silence he had been experiencing seize him. "We've got his name, sir. Doctor Riley Webster. Ph.D. in genetics. Background workup placed him as a consultant for a Western firm. Far Orbit Shipping. A subcontractor retained by NASA on the Titan Project. Webster was a normal employee up until a month ago, when he went on medical leave—terminal cancer. A melanoma affecting the brain and stomach. Webster continued to work at home for a time. Then he disappeared. Now we know where he went.

Bellmore halted the maddening back-and-forth gait before the window. He was scowling. The man is dying. Why should he take a notion to kill himself in one of our transport devices? I fail to see the logic.

Was he an Anti-Progression fanatic?

"Nothing of the sort. At least not as far as we have been able to determine. There's a grown son. We've questioned him. He's upset naturally enough, but certain that his father's actions have some purpose. Unfortunately, he has no idea what that purpose might be.

"The hell, you say. Won't tell your people you mean. The boy knows well enough why his old man went off on a crock. Keep after him until he talks. The pacing started up again. "What about Webster? Dead yet?"

"Look damn. It'll get off that crap. You're talking about a man. And he's alive. Larkey hesitated, uncertain about Bellmore's reaction to his outburst. Corson had warned him about the other's moods. "The press has the word. They're using the incident as a lead item. Our intruder is being made into something of a hero. Robinson Crusoe in space. So possibly we can turn this to our advantage. Make Webster out to be an intrepid, if misguided, pioneer.

Bellmore paused to watch a small-brightly colored lighter speed through the high-rise canyons of the sprawling city.

"That's a good angle. Hit on it. Just make sure, that you emphasize that his use of the transport network was completely unauthorized and unexpected."

Certainly, sir. Larkey took a deep breath and dropped the bomb that he had been holding back. Webster's on Titan. He went through one of the mine units. We have him in sight on the monitor camera. He looks pretty bad, but he's still moving. Still don't know what his aim is though. He's jumped from the moon to Io, and now he's on Titan, one of the largest moons of the solar system. Maybe he fancies himself the ultimate tourist?"

A sudden thought flashed through Bellmore's mind like an explosion. He blurted it out without consideration. "What if he is mad and has a bomb in that suit?"

"To blow up Titan base? Hardly likely sir. There's nothing much there but the powered foundation for the pressure domes and its just a slab of solidified sulfur reinforced with plastic webbing to prevent cracking when the ice flexes. Anything he can carry in a space kit won't make much of a dent."

"Then why the hell is he there?" Bellmore wheeled and glared so viciously that Larkey shrank back. "Why is that madman on Titan? And what is keeping him alive?"

"I sure don't know, sir. Webster shrugged helplessly. Webster's motivations escape me. We're continuing to work on the problem."

"How wonderful!" Bellmore's lips seemed to droop with sarcasm. "You see that you do that, Doctor Larkey. And if by some odd chance you discover something, be sure to let me know."

"Captain?"

Tony Nash turned in his chair bare metal covered with padded cloth. Efficient and comfortable but not particularly attractive. He raised his eyebrows questioningly. "And the two plus years that he had been working with First Officer Tyler they had come to know each other's ways."

Communication had been reduced to the barest of gestures.

Message all the way from Earth. Project Headquarters yet. Seems to be a warning. Someone has gotten to Titan ahead of us.

"There was a brief astonished moment when Nash said nothing. Then he slammed a fist against his knee with a crude and profane exclamation."

"Damn! I knew it. The moment I took command of this expedition. I guessed that they had something else in the works—faster ships or whatever. They must have passed us while we were crawling along in this monster snail-paced barge. Who did it? Wikes?"

"Not Wikes. Not a ship at all. Someone came to a full stop to work. They must have a transport network to shoot himself out to the colony site with a regular transmission of robots and materials. He'll be waiting when we get there."

"Walking? A chill slid up Nash's spine and stopped somewhere near his heart. We aren't going to arrive at Titan for another four years. The colony dome hasn't been erected. I'm not even sure that the robots are finished pouring the foundation slabs. What's he going to live on until we show up?"

"Tyler flushed. He won't be needing much, sir. He'll be dead soon enough. The
transport effect is sure to finish him off.

Oh, that's right. I had forgotten. Nash
shook his head. "You gave me a start
Number One. For a moment there I thought
we were all washed up. Inform the watch
then insert the message into the log.
Someday when we get to Titan, we're going
to meet this character. I want to know who
he is so we can put it on his marker."

The sun is shining down through rust-
colored clouds, the tiny disk of light pale
and dim. The ice plains are cold in the
distance a line of cliffs marks a shallow
methane sea, the shoreline purple with
scum. There's life on Titan. Not much just
single celled algae and a profusion of
predatory protozoans— but the exobi-
ologists are desperate. Up till now all
they've had to play with have been some
virulke crystals dug out of an ancient
ravine, cutting the bottom of the Mare
Acidalium on Mars.

I have propped myself up in the view of
one of the monitor cameras. They know I
am at home. The lens is glued to me with
macabre fascination. How long does it take
the images to get back to Earth from the
orbit of Saturn? I try to figure the lag but the
effort is too much, the figures keep drifting
away and getting lost. I give up

I can't feel my stomach anymore—a bad
sign—but I'm grateful for the change. I
glance at the helmet chronometer. Two
hundred ten hours. Quite a respectable
record I've built up. The corpse that
wouldn't die. They'll probably make a hor-
ror movie about me. I giggle then catch
myself.

None of that. Not in front of the camera.

The red bull's eye that I have painted with
the dye marker points out the location of the
sealed container. In it are the assembly
drawings and specifications for the space
suit. They are not entirely finished. There's
the frustration of having to die, but I am
very, very close. The fact that I am still alive
proves it. The transport is not killing me. The
cancer is. At least that is my hope.

I lean back and study the underdeck of
clouds. Lightning flickers briefly. It is bluish
orange. Looks peculiar. The rumble it
leaves behind is more shrill than earthly
thunder something like a rattle of pebbles
in a tin can. In the distance it is snowing. It
could be water crystals or even protein
flakes condensing out of the hydrocarbon
cloud banks. Titan is an unusual world. One
well worth visiting. Mentally I mark up
another score.

A shiver suddenly and feel cold. It's not
the suit's fault. The LS module is function-
ing perfectly. I'm the one going to pot. So
it's time. There's no sense in wasting any
longer. The scientists from the ship will be
able to find me even if they are years away.
When the robots put up the domes, they
won't have to disturb me. I've studied the
blueprints of the colony. I'm in a storage
yard.

And, once the news reports pass on the
word that I have arrived on Titan. James my

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Three-and-a-half years in the making,
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"Gaucho," featuring the hit single,
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son will unseal the safety deposit box and discover the envelope. The address will tell him what to do with it. Everything is taken care of, and I feel a certain contentment. At long last I can rest. It's all over.

Clouds churn overhead, blinding out the sun with gloom. Then its golden rays are back and the ice fields brighten. I stare into the yellow fire, memorizing its warmth, and then touch the button on my chest for the third and final time, locking it down.

My faceplate mists over from the inside. There is a momentary chill, then nothing.

Bellmore was behind his desk, the curtains drawn on the right. His wax heavy features brooded over the envelope that lay before him in threatening isolation. About him stood Corson and Larkey, seemingly at attention, like string soldiers on parade.

The Titan monitor reports that Webster is dead.

Corson's voice was bland and flat as it echoed around the room.

Apparently Bellmore did not hear. A probing finger touched the plans and specifications for the suit that peeped tentatively from one end of the opened envelope. He glanced up at Larkey. His eyes were bitter or perhaps only scared. You've seen them. Will it work? What does he see here? Or was Webster just a crank with a fatal luck?

Larkey shrugged slightly. There are tests to make — a good many factors to consider.

"Damn it, man. Don't lead me on. I can't take this any more!" I found out. Get Ellison off his fat cal and working? The human race is in a box, and if this is the key, I want to know it. Now move! Both of you!

The office emptied rapidly, leaving Bellmore alone in the shadows. After a while he pushed the envelope away across the desk in a violent gesture and got up to stare into the night.

The levish lights of Los Angeles glared at him, taunting him, as they spread out against the surrounding foothills.

A gentle breeze warm scented with pines and jasmine no nother. The aroma has no record in my brain. It is new, completely and wonderfully new. The brightness that has been leaving my eyes explodes into daylight as I open my eyes.

Panic turns me on the limy metal cot and a rusty gauzy of fear manages to creep from my wooden throat. Clumsiness pitches me forward across the grassy lawn. God! What has happened to my muscles, my coordination?

The thought Why am I alive enters my head. I put the thought aside for further consideration. The temptation to speculate is like a flame burning within me.

Then I see my suit. It is standing by itself in front of some bushes. The perfume lacing the air originates from the hedge, which is heavy with immense scarlet blossoms. But I only glance at the flowers. My attention is fixed on the suit. It has been cleaned, but the metal exterior is pitted and worn. It looks old.

First I crawl, then I stagger. Eventually I find I can walk again. I touch the suit. The metal is cold. It's real. I'm not dreaming. Whirling suspiciously I gaze about me. I'm on a hill. Aside from the grassy area, the bushes, and the suit I am completely alone. The only sounds are that of the wind and the melodious chirping of distant birds. At least they sound like birds.

A path of flat stones sets into the turf leads away from my laughable little cot. It looks so alien angry topped on the grass. I set it upright and then wander away the stones as my only guide. I'm comfortable. There is no pain. I feel whole and very alive.

Then I see the tower. It is a granite pillar thrusting up from beside the path, with a bronze plate affixed to its base. The hill has become a cliff. A low wall of rock protects the careless from the dropoff. Beyond the cliff, in a valley purple with mist, a city is glowing. It wakens a peculiar longing, but I want to look to the pillar. The old urgency that had been driving me seems to be gone replaced by some indefinable contentment.

I stoop and look at the greenish metal. The inscription is simple. FAIHER WEBSTER 1986.

A funerary marker. My own? Even if there is no date of death. But there is something else — an envelope taped to the plaque. I pull out a slip of paper and read it slowly:

Webster
You do not know me, but my great grandfather did. And history has decreed that you should not be forgotten. So I feel a certain familiarity for you as I write this.

The Executive Council of Titan decided to allow you to wake him so that your initial shock might be lessened. The decision was, we hope, a wise one. And please accept our apology for having allowed you to rest in situ so long, but your sickness was far advanced: and we had to delay until we could be sure that we could effect a cure and restore all the lost tissue. Irregulatily cell grafts of cloned tissue still require a great deal of time. But now at last we have paid our debt. There is food and drink behind the pillar. When you feel up to it, come down to the city. We have planned a welcome for you that you might enjoy and this time it is we who will have to wait.

Congratulations and Welcome Home!

Christopher Larkey III
Webster City
Transport Net Five
Titan

The paper slips from my limp fingers and flutters to the ground. Home. It seems just an instant since the chill of Titan had sucked away my life. I can't believe it is too unreal. But not so unreal that I ignore the path. Before long I'm running, pounding along the stones like a madman, laughing.

Above me in a pale sky the rings of Saturn gleam welcome.
This means that only 555 SPS units will be between Earth and the sun at any instant. Their area would be 42,750 square kilometers, and that is how much of the planet would be shaded. The total sunlit area of Earth's disk is 129,223,075 square kilometers. The shaded area amounts to 0.0331 percent of that.

The heat energy falling on Earth's sunlit hemisphere is $2.46288 \times 10^{16}$ calories per minute (246288 and 13 zeros). If you didn't understand, take up scientific notation in a high-school physics book. The heat energy falling on the solar collectors is $7.68 \times 10^{17}$ calories per minute or a mere 0.000000000003118 percent.

Earth is a big piece of real estate. Yet most of us think only of the part we see and most people on Earth have never been more than 25 kilometers from their birthplace. And then there were those beautiful, misleading photos taken by the Apollo astronauts. Earth looks so tiny in them, a fragile blue-and-white marble suspended against the blackness of space. It seems we could hold the planet in our hands.

Unfortunately, many people mistake this illusion for reality when they consider the SPS system or any other piece of large-scale technology. Ask any pilot how big our planet really is. Or anyone who has had to walk more than a few days to get from one place to another.

Space is a large by far. It is incredibly vast. Nothing we can build in space in the next century will have any effect on it, not even on Earth itself. The numbers don't lie.

During a recent NASA study of space industrialization, a man from one of the nation's largest electrical utilities rose to speak. He remarked that the SPS is the cleanest, most acceptable source of future energy available. It produces no radioactive waste, it doesn't pollute the air as coal-fired generators do, and it would cost no more than nuclear fuel or coal per kilowatt-hour. Quoting one of the rare rational statements released by the Department of Energy, "Regardless of how the SPS system is defined, the net energy ratio is positive." (For those not used to bureaucrats: this means that any SPS system would produce more energy than it would cost.)

The information is available to settle any questions about the safety and practicality of the SPS system. Anyone interested enough can seek it out. It's time for the critics to stop worrying and start learning.

The place to begin is Satellite Power Systems (SPS) Concept Development and Evaluation Program Preliminary Assessment DGE/ER-0047. September 1979. It cost $4 and can be ordered from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22151. Then read some questions and answers about the Satellite Power System (SPS) also from NTIS. The price is $4.60.

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As part of an advertising program we will send a solid 14K gold floating heart pendant charm to every reader of Omni Magazine who reads and responds to this printed notice before Midnight, May 25, for the sum of $5 plus $1 shipping and handling. There is no further monetary obligation. [Each heart is composed entirely of solid 14K gold and will be accompanied by our Certificate of Authenticity to that effect.] This advertising notice is being placed simultaneously in other publications. If you see it in more than one publication, please let us know as this information is helpful to us. Should you wish to return your heart you may do so to the address below and receive a full refund. There is a limit of one (1) heart per address, but if your request is made before May 16, you may request a second heart by enclosing an additional $5 plus $1 shipping and handling. No request will be accepted past the dates noted above; your unencashed check will be returned if postmarked later than those dates. Please enclose this original notice with your request, photocopies will not be accepted. Send appropriate sum together with your name and address to: ABERNATHY & CLOSTHER, LTD., Gold Heart Advertising Program, Dept. 662-3, Box 200, Carle Place, New York 11514.
2011
- Japanese investors open factories in the South Bronx in New York City.
- The United States passes laws banning the indiscriminate use of sugar, white flour, salt, artificial colorings, flavorings, and all additives in food.
- Polio has been totally eliminated in all Western countries.
- In South Africa, black revolutionary developments provoke the intervention of the superpowers; this development will ultimately lead to majority rule.
- Following the collapse of the U.S. economy there is a civil war in the United States.
- The majority of people leaving Earth for permanent jobs in outer space are no longer male, but female.
- The first human with upright posture almost 8 million years old is found near the Swaklik Hills in India.

2012
- The Roman Catholic Church ends its opposition to contraception. The church also permits a married clergy.
- The American Medical Association is disbanded.
- The first total eclipse of the sun since 1979 is observed by the people of the United States and Canada.
- A U.S. spacecraft reaches Mars moves over the planet, and picks up samples of soil, which are examined in an orbiting Spacelab to avoid contamination of Earth.
- A sensational discovery—the fossil of a tiny creature—is made, proving that Mars once possessed life.

2020
- Newly married couples are spending their honeymoon on the moon.
- More than 85 percent of all married women and 75 percent of married men have committed adultery during their married lives.
- A robot is developed with an IQ above 100.
- Earthquakes are prevented by injecting water into wells along fault lines.
- Nighttime is eliminated from the earth. Through the use of solar satellites, which store the sun's rays, nights are fully illuminated.
- For the first time in history people enjoy 24 hours of daylight.
- During the winter of this year an unidentified and particularly lethal influenza virus appears in India, leaps to Southeast Asia, and attacks Europe and the United States. Thousands die. The virus burns out in six months. The only people spared are those living in Argentina, Chile, and sub-Saharan Africa.

2027
- Sealed in the U.S. National Archives for more than 50 years the secret tapes made by Martin Luther King Jr. by J Edgar Hoover and the FBI are finally released to the public. These tapes—made by FBI bugging devices and wiretaps placed in King's home office and hotel rooms—sought to compromise him by exposing alleged sexual activities.

2030
- The average secretary earns over $200,000 a year, but $10 will hardly buy a cup of coffee.
- Computers and robots have become more intelligent than human beings and they make major economic, social, and technical decisions using reasoning that is beyond human comprehension.
- Antarctic icebergs are being melted to relieve water shortages.
- Advances in human understanding of crystal structures enable us to grow buildings.
- The average consumer is able to trade in his or her body for a custom-built model.
- People under 21 years of age are no longer deformed; sick, stupid, neurotic, undernourished or ugly.
- The average human being lives to an age of 120 or more.
- Despite decades of experimental work, scientists have failed—thus far—to see inside the atom and to demonstrate the existence of gravity waves.
- A democratic United States of the World is established. All wars are outlawed.
- Nuclear weapons stockpiled by the world's armies are sent into space to capture asteroids and bring them into orbit around the earth. The asteroids are used as raw materials for the industrialization of space.
- More than 250 million people are living on High-Orbital Mini-Earths (HOMEs). Of these, 100 million were born on the new worlds.
- Spacekind issues a Declaration of Independence from Earthkind.

2087
- A young physicist develops a unified field theory (first proposed by Einstein 150 years before) that provides the theoretical basis for faster-than-light travel.
- More people are living in space than on Earth.
There is no recourse is beginning to extend to the scientific community as well Davies reports having had conversations with top-level scientists who said Right on when the whales boats were sunk because they knew it was the only way anything would get done.

Given the continued absence of tougher no-nonsense legislation and an effective international policing body Davies sees a trend toward violence in the ecology movement because we have done all the things one should do in a democratic society to effect change Watson concurs.

There will be more and more environmental terrorism until the world is forced into creating an international policing body.

Conscientious people are concluding that they must choose between activism and apathy as small skirmishes are giving way to major battles. The Cold War over our environment may fast be approaching the flash point.
"SORRY, SORRY, SORRY"

By Dick Teresi

One of the best covered-up events in science took place in April of last year when a meeting between two of the giants in neuroscience ended literally in bloodshed.

The principals: Karl Pribram, the Stanford University neurosurgeon and psychologist who has made his reputation by operating on the brains of laboratory animals and then observing the changes in their behavior, and Washoe, the first chimpanzee to learn human sign language.

Pribram, despite a larger vocabulary came out the loser in the confrontation. Washoe bit off his middle finger.

Pribram was visiting the chimp at the University of Oklahoma's Primate Research Institute. "Washoe and I were getting along fine," says Pribram, "until I reached over to feed her from a sack that Roger Fouts, her trainer, was holding. Washoe must have interpreted my gesture as an attack on Fouts, and she promptly reached through the feeding hole of her cage and not only bit my right hand but ran it against the sharp extruded metal of the cage. Somehow in the fray my middle finger got almost amputated. It was dangling from a string. I was told while I was over at the sink frantically flushing water over the wound that Washoe signed 'Sorry, sorry, sorry.'"

Pribram was rushed to Oklahoma City's Presbyterian-Hospital where he underwent a five-hour microsurgery operation to sew back the severed finger. To complicate matters Pribram was scheduled to deliver a dedication address the next day for the opening of the hospital's clinical neuropsychology department. "Trooper that he is," Pribram left his hospital room to go two floors below for the opening ceremony. "I gave the lecture in my hospital gown and still had an IV [intravenous] needle in my arm. The talk was very well received."

Though Pribram's operation was essentially a success, a few weeks later he developed gangrene and lost the tip of his finger above the first joint. Despite this, he believes primate research is important and should not be held back because it is risky. "What needs to be remembered," Pribram says, "is that chimps are stronger than we are and should be considered just as dangerous as bears and lions.

Fouts blames the incident on a sharp expanded metal cage which he says did most of the damage to Pribram's finger rather than Washoe's teeth. "Had her intention been to bite Karl's finger off," said Fouts, "she would have done it. Fouts had wanted a safer chain-link cage but was overruled by a supervisor, which is one reason he has now left Oklahoma for Central Washington State University. Fouts also notes that Washoe had had an argument with a trainer the day before the incident. He says the incident was overreacting, because the bite was such a small one. "But when we got to the emergency room and they turned his hand over," said Fouts, "I practically fainted because it was severed all the way across to the bone of the finger."

Pribram was not Washoe's first victim. An Oklahoma graduate student lost a piece of his ear to the chimp and stirred up controversy by telling his story to the campus newspaper. Fouts defends Washoe, saying that she's a good-natured chimp, but that it is still living in a cage. His current project is to build a halfway house in Africa to help return home-raised chimps like Washoe to the wild once they become too large to handle. He is flying to London to enlist Jane Goodall's help and then on to Kenya to speak to Richard Leakey. "I owe Washoe a lot," he says. "Science owes her a lot. She really is a sweet girl."

Meanwhile Pribram, despite the loss of a fingertip continues to perform his matchless surgery. He told Omni reporter Caroline Rob: "A week after I got out of the hospital I decided to start doing more surgery which I perform on animals for research purposes. Problem was, when I came to put on my gloves in the operating room, my injured finger was too swollen and puffy as well as bandaged up to fit into a standard surgical glove. One of the technicians went out and got a condom and sterilized it and I used that over the injured finger then donned a regular glove with the middle finger cut out. We had a ball. You can imagine the jokes when it came to sterilizing the condom along with all the other stuff required for surgery."

In the December 1980 Omni interview Cornell astrophysicist Thomas Gold said that enormous concentrations of methane could be found deep within the earth's mantle. Gold's problem is that he can't get anyone in government to listen to him. Now he has support — and from no less a figure than James Fletcher, former head of NASA. "It is quite possible that the whole energy crisis that the world now faces could dwindle into insignificance," Fletcher said. "If some of the recent theories about methane are verified experimentally. "Fletcher was addressing the House Subcommittee for Space Science and Applications. "If, as predicted, large quantities of methane are still concentrated in the earth at depths that can be economically reached," said Fletcher, "the entire cost of the U.S. space program will have been justified many times over."
When a right-handed artist draws a face in profile, he tends to show it facing left. This is so probably because he wants to outline the essential features first: eyes, nose, mouth — and then work back. It is said that the figures in ancient cave paintings predominately face left, which suggests that our ancestors have been righties for many thousands of years.

In addition to the profiles in the quiz, some other lefties are the Eveready cat, the NBC peacock, the Antheuswer-Bush eagle, John O'Keefe's deer to the point, the Wild Turkey and Prince Albert. Of the 23 flags of U.S. states and territories bearing a clearly asymmetrical central figure, 22 face left, the only right-turned figure is a standing liberty on the state seal of Virginia.

Examples of right-facing profiles aren't hard to find. One you see almost every day is Abraham Lincoln on the cent. Some product logos that face right are the Greyhound hound, the Cutty Sark sailing ship, Aunt Jemima, and the green Giant. The Quiz was loaded with left faces to illustrate the pervasiveness of the right-hand influence, even in commercial art.

FOLLOW-THE-DIRECTIONS QUIZ

With the exception of the first item (Monopoly) all directions on the quiz are counterclockwise. It seems that whenever human beings set themselves in rotational motion, their preference is to do it counterclockwise. Consider track-and-field events, roller derby, automobile races, horse races, baseball, speed skating, merry-go-rounds and other carnivalesque revolving doors, cable-operated model airplanes, the chariot race in Ben Hur, and the customary flow of people around skating rinks and ships in the world's harbors.

Seen from the North Pole, as is traditional, the earth itself is spinning counterclockwise. This indirectly results in Northern Hemisphere weather systems that spin the same way. Ideally, water is supposed to drain counterclockwise out of a sink in the Northern Hemisphere, clockwise in the Southern. In fact, water flows out of most sinks in the same direction that it flowed in.

The reason is that the Coriolis force, which is supposed to account for the asymmetry, is almost incomprehensible and is overpowered by the slightest current. In ideal, non-maximum water, the molecules on the side of the sink are slightly closer to the earth than are the molecules at the north side of the sink, hence they travel a slightly larger circle around the earth's axis every day, hence they are supposed to be moving through space slightly faster than the molecules at the north side of the sink.

That's how weak the bathtub vortex is. A researcher at MIT was able to get consistent counterclockwise vortices, but he used a circular tube, six feet in diameter, and let the water sit for several days before pulling the plug. Incidentally, investigators at the University of Sydney Australia found a significant tendency for water to drain clockwise but only if it had been allowed to sit in a laboratory overnight or longer.

There is the theory that mankind's right-handedness and his counterclockwise preferences might be traced back to evolution in the Northern Hemisphere or to some other Coriolis imbalance. Needless to say, the strongest supporters of this theory are nonphysicists and nonanthropologists.

It may be a coincidence but a counterclockwise rotation can be seen in our symbols. The smallest, oldest ancient symbol that existed in mirror image forms, but the form adopted by the Third Reich has arms that jog right, leaving the appearance of a counterclockwise shift of turning around the center. Likewise, the yin yang symbol exists in two mirror image forms, but the version adopted for South Korea's flag shows the black and white halves chasing each other around in a counterclockwise flow.

The only motion on the quiz that goes clockwise is the path around a Monopoly board. Far from being an exception to the rule, however, this is just another indication that all's right with the world. The flow of cards or game pieces around a table is not people in motion but motion imparted by people which starts with each person moving to his or her left.

The only human motions that consistently go clockwise are those of small children who know how to turn something on or up for more volume, heat or water for example. The right hand is stronger turning clockwise so clockwise it is for dialing a telephone, winding a watch, using a can opener, an eggbeater, or a pencil sharpener. Screws bolts light bulb jars lids all are made to be tightened with a clockwise turn.

The bias toward moving our whole bodies in counterclockwise cycles undoubtedly can be traced back to the right-handedness of every human society but how one led to the other is unclear. Most anthropologists pointed this out to not only don't have an explanation but say they never noticed the phenomenon before.

Oh yes, the missing line from Those Were the Days, the theme song from All in the Family, is "Gee, our old LaSalle ran great GG."
Jet lag? You’ve suffered from it, declares Bob S., an oil company vice-president. “I landed in Algiers, took a short nap, and went to buy some oil. Later I realized that I’d let them talk me into a fifteen cent-per-barrel hike we shouldn’t have had to pay. That’s a hundred fifty thousand dollars per million barrels of oil, and we bought a lot of oil.”

His costly error might not have been made if the oil executive had known about a novel jet-lag diet. Because millions of people travel abroad every year this new diet may do more to alleviate the discomforts of flying than the much-touted wide-bodied Jumbos. Devised by Dr. Charles Ehret, of the Argonne National Laboratory, near Chicago, the program shifts the body into foreign time before flight and eliminates many of the ill consequences that accompany jet lag: cloudy vision, foggy intellect, indigestion, and erratic sleep-and-wake cycles.

Formally termed circadian desynchronization, jet lag occurs when several physiological functions become out of phase. Body temperature, for example, which hits a low at 5 A.M. EST, would reach bottom at 10 A.M. Greenwich Mean Time for the New York-London voyager. Other sensitive functions so affected are the sleep/wake cycle, hormone output, and urine flow. Although the cells that carry out these functions run according to their own clocks—liver cells are attuned to one clock, skin cells to another—all of them usually coordinate their operations in synchrony.

“The body is like a crew team with a coxswain,” Dr. Ehret explains. “Although each member of the crew has a different rhythm, the coxswain keeps them together by calling stroke.” But if the coxswain is thrown overboard, the rowers will soon lose the boat.

Similarly, body cells lose their harmony when they cross into a new time zone. Responding to different and often contradictory cues, they suddenly function on their own time clocks: “Each rhythm is changed to a different degree, and each takes its own time to readjust,” Ehret says. Several body centers can reestablish synchrony, but the brain usually exerts the greatest level of control. Second in the pecking order are the adrenal glands, which manufacture cortisol, a potent steroid hormone that peaks in the blood ordinarily around 8 A.M., just in time to energize body cells for a busy day. The cells give each other an argument,” Ehret says. “Without this high inertia system, bodily functions would have no integrity. Every time a ham fouled the body would change its time.”

Ehret’s jet-lag program takes advantage of special clues called Zeitgebers, or time givers, which help the cells operate in harmony. Harnessing the more potent of these—such as food, drugs, and rest cycles—accelerates the physiological transition from one time zone to another. Circadian rhythms normally follow a routine schedule, and the body tags along—with the sun down with the moon. But powerful time cues occurring at other-than-usual intervals can alter the body’s circadian behavior. You wouldn’t drift asleep if a long-lost love dropped by with a creamy cheesecake at 8 P.M. or 2 A.M. The Ehret diet plan involves monitoring meal composition, timing social activity, and curtaining your drug intake (coffee, tea, cocoa).

A crucial feature of the plan to combat jet lag is a special four-day diet that focuses on the day of departure and the three days immediately preceding it. The first day of the regime, three days before takeoff, is a feast day, with a high-protein breakfast and lunch capped by a high carbohydrate dinner. Mashed potatoes, spaghetti, corn, fruits, and bread are served with a high carbohydrate dinner. Mashed potatoes, spaghetti, corn, fruits, and bread are served with a high carbohydrate dinner. Mashed potatoes, spaghetti, corn, fruits, and bread are served with a high carbohydrate dinner.
THROUGH THE UNIVERSAL LENS—"I wanted to create a photographic treatment of evolution," says photographer Pete Turner, "that moved from earliest times to the distant future in a series of images." Turner, a New York photographer famous for special effects, works on some of the top advertising accounts in the country. His stunning visual work has won many awards. But Turner's special love is for imaginative projection through composite images: Through his lens a history of man and his planet unfolds with surreal clarity. Look for this exciting pictorial next month.

OF THE WORM RUNNERS—Famed psychologist James V McConnell suspects that if the research establishment had its way, there'd be a "special very hot place in hell reserved for those scientists who dared crack jokes from the sanctity of the lab." McConnell ought to know. For 20 years the editor of the outrageous, iconoclastic Worm Runner's Digest, he dared to defile some of science's most pretentious balloons with the barbed point of his wit and suffered: the consequences. Science can be fun. Jim McConnell in next month's Omni.

GHETTO KIDS IN SPACE—When the U.S. space shuttle blasts into orbit, it will carry sophisticated payloads for the military's big business, and the tenth-grade class at Camden City High School in New Jersey. Under the gentle tutelage of RCA scientists, these inner-city youths have formed their own space-science think tank, devising constructing, and monitoring a real-life space shuttle experiment. Can ants survive in space? Can street kids find new direction and pride through science? Find out how this unique experiment is working in the March Omni.

INTERVIEW—Donald Symonds believes that men like to copulate a lot. And they desire a variety of sexual partners, much more than women do. This celebrated University of California anthropologist thinks that physical characteristics, especially such youthful features as soft, smooth skin, are the chief determinants of a woman's physical attractiveness while men rely on their political and economic prowess. Barroom talk? Hardly. Symonds asserts that these stereotypical sex roles are our biological and evolutionary destiny. Get ready for a controversy—perhaps downright maddening—examination of human sexuality in next month's interview.

SCIENCE FICTION—Roger Zelazny's protagonist tracks down "The Last of the Wild Ones" in a gleaming car named the Angel of Death, a group of irate citizens protest to the manufacturer that their playthings are self-destructing in Barry N Malzberg's "Icons," and a very nasty man gets his comeuppance in Warren Brown's story "Last Waltz." Look for entertaining reading in Omni's next issue as collation cheese or diet yogurt. The third day, the day before the flight, is a feast day like Day 1, and the day of departure, Day 4, is a fast day. The last should not be broken until destination breakfast time, when you may go ahead and devour a heaping meal of high-protein food.

Fasting is Ehret's way of adjusting the body's glycogen, or energy reserve, cycle to its new schedule. Ordinarily glycogen levels surge from about 2 percent to 12 percent of the liver weight and then ease downward. Those on an American time hit the peak of their glycogen reserve while on a European time approach an empty tank. If you fast, however, glycogen levels hover close to 2 percent level. The break-the-fast meal as the first strong Zeiggeber should firmly turn the glycogen oscillations onto the European schedule. It doesn't matter what high-protein item is consumed—egg that peculiar to-airline delicacy braised beef, Portuguese or plain old bacon and eggs. The timing of the meal makes it breakfast.

Ehret also stresses careful timing of coffee, tea, and cocoa. Embibed in the morning, these beverages activate the body at a later time than normal—perfect for westbound travelers: disastrous for eastbound travelers. They have little effect as early in the day as British tea time but are potent phase advances from dinner time. Eastbound passengers are therefore advised to indulge in an evening caffeine spree westbound travelers should abstain, or else they will be hours ahead of the foreign schedule.

Avoiding social activity on the airplane may be the most exasperating part of Ehret's plan. Sure, it's natural to want to kibitz with your neighbor. But this is intellectually exciting and promotes the production of chemicals in the brain. A powerful Zeiggeber. Furthermore, it keeps one's body clock from your watch, and the body正品 from the foreign schedule. At destination using time, you can yak, do some isometric exercises beat your chest or do your deep breathing." Ehret jokes. In all seriousness, he adds that exercise does raise oxygen levels and body temperature convincing the body that it is morning. Finally you should not nap upon arrival instead crawl in all about the same time as the natives do.

Airplane pilots appear less susceptible to jet lag. "Medicinal studies show that they adapt much more quickly than ordinary travelers." United Airlines flight surgeon Arthur A. Manfredi reports. A comforting fact to remember the next time you fly.

But for hard-hit ocean-hopping travelers, Ehret's plan may provide the long-sought answer. "I can't prove scientifically that this works yet," he admits. "We've had a hundred to a hundred fifty people try it normally and some of them have sent back the hard data we need. Mostly, though, we get postcards from the north face of the Eiger saying, 'I feel great. Thanks a lot.'"
Anthropologists have scratched around the ancient sediments and learned much about how man evolved from the great apes. But to learn why we evolved requires deeper digging—perhaps even to the center of the earth where our planet's magnetic field is formed. For it is the magnetic field that protects us from the stars.

Earth's magnetic halo is generated in its core of molten nickel-iron alloy. Currents driven by Earth's rotation, like a dynamo, send this magnetic field far into space.

This magnetism has few known effects on life, but it does protect us from cosmic rays. Consisting primarily of protons, electrons, and alpha particles (helium nuclei), billions of cosmic rays bombard Earth every second. Like all charged particles, they are turned aside by magnetism. Earth's field pulls them into tightening spirals, toward the magnetic poles. Collisions with air molecules slow them and create radioactive secondary particles. Both mix with the atmosphere and become a permanent part of the environment. This interaction creates the famed Van Allen radiation belts and the aurorae (Northern and Southern Lights).

Radioactive elements created by cosmic rays can cause changes in DNA. Once modified, the DNA may be replicated in mutant cells. And this fact suggests some questions. Could a change of DNA induced by cosmic rays turn some large animal into a highly adaptable survival machine? And what if that creature were an ape?

For reasons not yet understood, Earth's magnetic field occasionally undergoes wild fluctuations in strength and direction. Studies of magnetic rocks and deep-sea drilling show that Earth's polarity has changed nine times in the last 4.5 million years. The latest reversal took place 700,000 years ago. For about two millennia the magnetic field was absent, or nearly so.

Is it possible that Earth's creatures, including our own ancestors, were subjected to intense mutating radiation during one of these episodes? Perhaps.

The solar magnetic field may also have had a role. Every 11.1 years, the sun completes the sunspot cycle, a regular buildup and decline in its magnetic field. At the end of each cycle, magnetic storms blast energy particles out of the sun. And even a distant supernova generates high-speed particles that, if not deflected by the magnetic fields of the sun, could reach Earth's surface. Is it likely that during some field reversal the magnetic field may have been down on the equatorial regions where man's ancestors roamed? Again, perhaps.

Geneticists cannot measure the effects of cosmic-ray showers. There are too many unknowns. How intense are cosmic-ray showers during reversals? Does the magnetic field vanish altogether? How strongly do cosmic rays affect DNA molecules? What part of the genetic code is altered? And do cellular-repair mechanisms counteract the mutations?

Even if we know, population genetics still could not give us the final answer. We cannot adequately describe the complicated feedback processes that form a gene pool as vast as man's. Even if cosmic rays did influence our development the effect might have broken down once our gene pool grew large enough. It is clear only that man can survive field reversals. There have been many of them during man's tenure on the earth.

Research on cosmic-ray mutations has turned up an apparent paradox. As far as we can calculate, none of these radiation effects raise the mutation rate significantly over background levels. And yet deep-sea drilling shows that several common species of Radiolaria vanished at the time of recent paleomagnetic reversals.

Did magnetic-field reversals play a key part in creating man and destroying some other species? We may eventually wish to know. The current cycle of Earth's magnetic field is nearing its end. Observations by NASA's MAGSAT satellite have shown that the magnetic field is now growing weaker. In 1,200 years it will flip again. And once more particles from the stars may alter the destiny of life on Earth.
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In particular reaction to The Exorcist disturbed me, he admits: "I'm not religious according to any rules and I don't believe in the Devil. His vivid doings in the film did not shock me. What troubled me was that our society is so preoccupied with this little girl struggling against an uttermost evil. We were fascinated by her humiliation and defilement on the screen—a fascination that I think is very destructive. I suddenly read this as a symptom of the fact that we are not ready today to defend our children at every point. Why, for example, did the older generation send out all those young people to be killed in Vietnam? Because they loved them? Why do we not care deeply enough whether there will be food and energy and living space for their future? We do not love our children enough, and this scares me.

According to Von Sydow, this hardness is attributable to the increasing impact of the communications media, particularly television. The Exorcist merely exposed these attitudes. People's feelings about real events are influenced by how the news media present them. If a robbery or a terrorist attack is committed, it should be presented in such a way that everyone will understand the horror of it. Yet wrongdoers are rarely ridiculed. The reason he believes this is that film, the focus of the news, is usually slanted from the less interesting victim to the more commanding villain. We are drawn to negative themes and as a result, criminals often get good reviews. They are frequently shown to be very tough and very heroic in their perverse ways. People become morally confused by this.

But if the media are responsible for some part of our ethical decay, Von Sydow views them as a potential cure as well. "When I was a boy I was told that you were supposed to think everybody smaller or weaker than you and that two should not beat one up. This is totally out of kilter with what we practice today. I grew up in a very protected environment. Sweden was a neutral country during the Second World War and although we could see and hear what was happening in Denmark, by the time I was ten, what we were supposed to think was totally out of kilter with what we were actually experiencing."

Sweden was a neutral country during the Second World War and although we could see and hear what was happening in Denmark, by the time I was ten, what we were supposed to think was totally out of kilter with what we were actually experiencing. Yet it is still a very important country. And the story line was very much influenced at the time by the conflict with the Japanese and all we heard was very much like what we hear today. It was topical in that way. Yet it was set in a wondrous future that excited my imagination.

I also read Wells and Verne, naturally, but the thing that was not until I really got into science fiction films or read other authors is that I read the Flash Gordon and Buck Rogers comic strips in a magazine. Buck Rogers was an especially important hero to me. The story line was very much influenced at the time by the conflict with the Japanese and all the heroes looked very Oriental. It was topical in that way. Yet it was set in a wondrous future that excited my imagination.

New technologies are being discovered daily and because any of these can have an impact even greater than television. Von Sydow regards science fiction as one of our most vital artistic outlets. "I always felt that way. I've not read everything in science fiction of course, but I always knew that it was always available in Sweden. When I was a child, I used to read the Flash Gordon and Buck Rogers comic strips in a magazine. Buck Rogers was an especially important hero to me. The story line was very much influenced at the time by the conflict with the Japanese and all the villains looked very Oriental. It was topical in that way. Yet it was set in a wondrous future that excited my imagination."

As for his own future, Von Sydow says his expectations from his first foray into the science-fiction film are more modest. "I only hope that Flash Gordon doesn't make me Manitoba, he laughs, 'then I am not typecast by what may well be my broadest exposure yet to American audiences. Or if that happens that some of the people who see me as Ming will be interested enough to find out what else I've done."

Von Sydow grins and tongue square in cheek. He rumbles in his best Ming bass. "I should not have to force them, you know."
hypothesis," law enforcement and the investigators avoid "cuing" the subject. The hypnotized person is highly susceptible to suggestions, so the questioner must ask about the crime in an open-ended manner. This avoids cuing the witness into a memory or caveat memory that will fit police expectations or confirm the law enforcement officials' suspicions about who is guilty. Quite often the most peripheral recollections, such as noticing a fat woman walking two dogs near the scene of the crime, prove the most valuable.

Law enforcement officials have come to accept hypnosis as a device that retrieves specific information from the pretrane vault of 40 trillion to 50 trillion data bits the mind contains. Yet critics of forensic hypnosis, such as Dr. Martin Orne of the University of Pennsylvania, claim that the risks of sending a person to jail on bad data retrieved from a hypnotic interview are extremely high. Hypnosis is no guarantee that a given subject's recollections will be truthful. A subject can often simulate a hypnotic trance. Some people can lie willfully under hypnosis. The hallucinated environment tends to solidify certain events in the subject's mind—events that in a waking state he or she would be uncertain about. The critical functions of the brain are reduced.

Such scientists as Orne maintain that the hazards of cuing a subject into producing an artificial recollection of the crime go far beyond mere verbal suggestions furnished by a hypnotist or investigator. The potential witness will subliminally pick up information from the first moment he or she walks into the police station and will incorporate this information into his or her hypnotic memory of the crime. The mind weals all the loose bits of information gathered from newspapers, conversations with the police, and neighbors' gossip into a coherent and unshakable whole.

The reconstructive ability of memory has been demonstrated in a recent study comparing John Dean's Watergate testimony with the actual tapes of the conversations he described. With absolute certainty Dean gave a detailed description of White House wrongdoing. While Dean was correct about the overall situation, his attribution of quotes and descriptions of meetings with Nixon, Haldeman, and Erlichman were totally inaccurate and taken out of context. Considering the general unreliability of police witnesses' claims, critics of forensic hypnosis claim that hypnotically enhanced memories are often harder to subjective certain things that didn't actually happen.

Since a California court in 1987 ruled the law of the United States does not recognize hypnosis as an inclusion of hypnotic evidence in trials has gradually become accepted. However, law enforcement officials say that such evidence must always be corroborated. Clues uncovered during hypnosis often won't be introduced in court, they will be used only to aid in investigation. A majority of states still maintain that evidence obtained under hypnosis is inadmissible, but several states permit a witness to recall details remembered only under hypnosis. In an extreme case, currently on appeal in New York State, a man was convicted of murder solely on a description furnished by a witness under hypnosis. In a waking state the witness whose testimony was used during that trial couldn't identify the killer.

Though considerable scientific disagreement still persists over the efficacy of trance-induced memories as an investigative tool, hypnosis has solved cases that defined ordinary solution. Richard Doucet, the FBI's special agent in charge of the bureau's program, is a consultant on forensic hypnosis. He cautions that hypnosis is not a panacea to be used instead of standard investigative techniques. To meet the challenge of the 1980s, law enforcement officials need every scientific tool available. In the future, the deductive reasoning of Sherlock Holmes and the stumbling of Columbo may be augmented by a twenty-first-century Philip Marlowe armed only with a swinging watch.
COMPETITION

By Scot Morris

Our August 1980 column entitled "Noncompetitive Games," featured a name association diversion called "Links." In a bit of about-face, the name association game was turned into a competition.

The idea was to compose a list of 20 famous personalities—living, dead, or fictional—and connect each name by a single word. The idea was to see who could finish his list first. It turned out that about a dozen players turned in lists in a week after the column was published.

Competitors included readers in every state of the union. A reader from Iowa completed the list in 12 hours, while another from Texas submitted his list in 10 minutes. Some of the names we received were:

- Paul J. Heald, Humboldt, Iowa
- Fidel Ford, Jack Lemmon, O. J. Simpson
- Anita Bryant, Marvin Gaye
- Jerry Stiller, Mercier Island, Wash
- John Campbell, Soupy Sales, Captain Horatio Hornblower, Doc Severinsen, Ed McMahon, Minneapaha
- Angelo Papa, Trenton, N.J.

HONORABLE MENTION

Vanity Coors, Olet Yuman, Eve N. Sitt, Beat Coombes, Nessie Sary, Thor Van Peabody

Trudy Zoloty, Polly Tick, Al Bandswitch

Al Kong, Ted Demmit, Ann Uther

John J. Dowling, Boulder Colo.

*The names read like the opening words of the Declaration of Independence

- Abraham Lincoln, Johnny Daniels, Samuel Colt
- Citation, Broderick Crawford
- Smokey the Bear, Bert Parks, Johnny Bench, J. D. Salinger
- John Kirkland, Santa Barbara, Calif.

- Oliver Twist, Chubby Checker, Orson Welles
- Citizen Kane, Herman Wouk, Alfred Love
- Tennessee, Austin, Texas
- George Mifflin, Dallas, J. R. Tolken
- Rose Antoin, Lakeview, N.Y.

- Muhammad Ali, Ali Baba, Barbara Walters
- Rex Stout, Alec Guinness
- Tim Pickens, Twiggy, Leif Ericsson, Fran Tarkenton

RUNNERS UP $125

Sir Charles Wheatstone, Beau Bridges, Bo Derek, Nadia Comaneci, Jim Beam, W. C. Fields, Minnowlark, Lemon, Admiral Byrd, Robin Hood, Little Red Riding Hood, Wolfgang Amadeus Mozart, Don Giovanni, Donald Duck, Sir Francis Drake, Prince de Leon, Bingham Young, Oral Roberts, Robert F. Lee, Stone Wall Jackson, Sir Charles Wheatstone,

- Deborah Erickson, Columbia, Mo.

GRAND PRIZE WINNER $100


J. Jim Navary, Chesapeake Va.

RUNNERS UP $25

Sir Charles Wheatstone, Beau Bridges, Bo Derek, Nadia Comaneci, Jim Beam, W. C. Fields, Minnowlark, Lemon, Admiral Byrd, Robin Hood, Little Red Riding Hood, Wolfgang Amadeus Mozart, Don Giovanni, Donald Duck, Sir Francis Drake, Prince de Leon, Bingham Young, Oral Roberts, Robert F. Lee, Stone Wall Jackson, Sir Charles Wheatstone,

- Deborah Erickson, Columbia, Mo.

Lassie Bill Bailey, P. T. Barnum, Bozo, Billy Carter, August Busch, Fredno March, John Philip Sousa, Burt Bacharach, Marquis de Sade, Renee Richards, Richard Pryor, George Burns, Alex King, Dave Kingman, Batman, Dracula, Ayatollah Khomeni, Goofy, Lassie,


Patrick Duffy, J. R. Fawcett, Sammy Davis, Moose Dayan, Jim Nabors, Vivian Vance, Fidel Merman, Patrick (Man from Atlantis) Duffy

- Duane Richards, Libby Mont


- Laura L. Siegel, Oroville, Calif.


- Ernie Tammenga, Golaeta, Calif.


- Pamela Herbert, Huntington Beach, Calif.

FORBIDDEN PLANET, VISIT TO A SMALL PLANET, THE INCREDIBLE SHRINKING MAN, THE INCREDIBLE INVASION, STARSHIP INVASION, STAR WARS, BATTLE BEYOND THE STARS, BATTLE BEYOND THE SUN, JOURNEY TO THE FAR SIDE OF THE SUN, JOURNEY TO THE SEVENTH PLANET, HAVE ROCKET, WILL TRAVEL, ROCKETS

- X. M. Dark Star, Invasion of the Star Creatures, It Came from Outer Space, Message from Space, A Message from Mars, Red Planet Mars, Fantasia Planet, Forbidden Planet.

- Paul J. Heald, Humboldt, Iowa

- Fidel Ford, Jack Lemmon, O. J. Simpson, Anita Bryant, Marvin Gaye

- Jerry Stiller, Mercier Island, Wash

- John Campbell, Soupy Sales, Captain Horatio Hornblower, Doc Severinsen, Ed McMahon, Minneapaha

- Angelo Papa, Trenton, N.J.

- Abraham Lincoln, Johnny Daniels, Samuel Colt, Citation, Broderick Crawford

- Smokey the Bear, Bert Parks, Johnny Bench, J. D. Salinger

- John Kirkland, Santa Barbara, Calif.

- Oliver Twist, Chubby Checker, Orson Welles, Citizen Kane, Herman Wouk, Alfred Love

- Tennessee, Austin, Texas

- George Mifflin, Dallas, J. R. Tolken

- Rose Antoin, Lakeview, N.Y.

- Muhammad Ali, Ali Baba, Barbara Walters

- Rex Stout, Alec Guinness

- Tim Pickens, Twiggy, Leif Ericsson, Fran Tarkenton


- Matt Dillon, Omar Sharif, Moses

- George Bush, Bob Newhart, Dr. Chris

- traan Barnard

- Farl Warren, Brr Rabbit

- Bugs Bunny, Doc Holiday, Donald Duck

- Mother Goose, Ma Kettle, Peter Pan

- Charles M. Hudson, Columbia, Mo.

- Henry Kissinger, Gene Simmons, Ernest Gallo, Wyatt Earp, Linda Blair

- Byron Warren, Lubbock, Tex
BUY BACK SOME OF THE FUTURE!

John Bricker James Mason, Jeanne Dixon Russell Lynes, Beatrice Straight — Larry N. Lorenzi San Francisco

Zasu Pitts, Don Cherry, Bing Crosby, Bo Derek, Moses, Willie Mosconi, Esther Williams — M J Newitt Virginia Beach Va.


Eddie Cantor, Genuine Risk, Evert Knickel, Marie Antoinette, Sara Lee — Kevin Best, Santa Rosa, Calif.

Admiral Byrd, Santa Claus, Rudolf Nureyev, Yoko Ono, Mr. Bill — Prudence Bonham, Santa Ana, Calif.

Dale Bumpers, Freddy Fender, Buck Dent — Mrs. D. Rideout, Cedar Rapids, Iowa

Pontius Pilate, Jimmy Doongenee, Jimmy Carter — Larry Bender, Lead, S. D.

Scott Morris, Mercury Morris, M. G. Wells — Robert White, Denver


Dolly Parton, Robert Stack, Audrey Jemima — Clara Bauer, Megan, Ohio, and Andrew Hartline, Irvine, Calif.


Don Ho, Santa Claus, Yul Brynner — J. Retiwa, Iselin, N. J.

Franz Kafka, Max Roach, Lionel Barrymore, Julian Corona — Roger Young, Hollywood, Calif.

And with apologies for limited space, thanks to all these two-name gems: Harvey Wallbanger, Mike Hammer, Thomas Tryon, Levi Strauss, Abbie Hoffman, David Jansen, Robert Frost, Raymond Burr, Freeman Dyson, Abraham Lincoln, General Joe Hooker, Anthony Trollope, General William Tecumseh Sherman, George Burns, Karen Valentine, Bugsy Moran, Matt Helm, Mr. Sulu, Eric Clapton, August von Wasser, James McNell, Whistler, Frank Zappa, Kermit the Frog, Lou Ferrigno, Darth Vader, Ayatollah Khomenei.

Jack Daniel Square Coaster Set

Every once in a while, something comes along which is so simple and direct that I wonder why I didn't think of it myself! Well, even though I didn't think of these someones all the distillery decided to have a square drink coaster to match the square glass. Pretty clever, huh? Anyways, these coasters are replicas of old Jack Daniel advertising art and are full color. Each is different and measures 4 1/2" square. They are cork backed and impervious to electric burn-out. My $10.00 box includes postage.

P.S. But I wonder if they're so smart why did they make six coasters for only 1 glass?

Send check, money order, or use American Express, Visa or Master Charge, including all numbers and signature (Minnesota residents add 6% sales tax.) For a color catalog, full of old Tennessee cards and Jack Daniel memorabilia, send $3.00 to the above address.

Free! Edmund Scientific Catalog


Flush your free catalog!

Name ____________________________
Address __________________________
City ____________________________ State __ Zip ____________

Clip and mail coupon today to:
Edmund Scientific Co. Dept 3018 KN04 Ecorse Bldg., Ecorse, Mich 48027

Polished for danger, the puss moth caterpillar (Cerura vinula) inflates a fold of skin around its head to create a cryptic facial camouflage. Black spots simulate eyes, and scarlet hues enhance a remarkably human countenance. The caterpillar's hindmost legs are specially modified defense organs; two filaments protrude like stingers, but they are actually harmless. The creature, however, is not. If further disturbed, it emits an irritating formic acid from a gland in the thorax. These elaborate defenses combine to protect the insect from predators as it feeds among sallow leaves. Their habitats include the poplar trees of West Germany, where Hans Pfletschinger caught this specimen for studio shooting. After re-creating its natural environment, Pfletschinger photographed the larval moth with a Hasselblad 500C camera and a 120mm planar lens. Two flash lamps illuminated this striking example of physiological adaptation.
Who's been paying attention?

GAMES

By Scot Morris

Boy, the way Glenn Miller played Songs that made the Hit Parade! Guys like us, we had it made Those were the days Didn't need no welfare state Everybody pulled his weight

Those were the days

Can you supply the missing lyric? How many times have you heard it? When are you going to start paying attention?

We observe things every day that we scarcely notice. Our brains automatically attend to the important and ignore the incidental. From the rush of incoming stimuli the reticular formation in our brains filters out that which is repetitious and insubstantial and doesn't let it pass. Only the important information makes it through to consciousness.

But who is to say what will become important? To a truly observant mind—like that of Sherlock Holmes or a scientist—even the most trivial data may turn out to be significant.

Here are three pop quizzes to determine how much you have noticed in this lifetime

HOW OBSERVANT ARE YOU?

1. It is a clear, starry night, and you see a crescent moon in the sky that looks like

2. On a standard traffic light is the green on top or bottom?

3. The stripes of a man's tie usually slant down in what direction (left or right) from the wearer's view?

4. In the Lincoln Memorial, which foot on the statue of Lincoln is in front?

5. In Grant Wood's painting American Gothic is the man to the viewer's left or right?

6. In which hand is the Statue of Liberty's torch?

7. Name the five colors on a Campbell's soup label

8. What two letters of the alphabet do not appear on a telephone dial?

9. What two digits on a telephone dial are not accompanied by letters?

10. When you walk, do your arms swing with or against the rhythm of your legs?

11. How many matches are in a standard pack?

12. On the American flag, is the uppermost stripe red or white?

13. What is the lowest number on an FM radio dial?

14. On a standard typewriter, over which number is the % symbol?

15. Which way does the red diagonal slash go in the international "no parking" or "no smoking" signs?

16. How many channels on a standard VHF television dial? (Careful, now)

17. Which side of a woman's blouse has the buttonholes?

18. Do books have their even-numbered pages on the left or the right?

19. Here are two dice. One has the pips arranged in the standard way as you have seen them on virtually every die you have ever handled. The other is a mirror image with the pips oriented backward. Which is the "real" die?

20. On which side of a sink is the cold water faucet?

21. How many sides are there on a standard pencil?

22. Sleepy, Happy, Sneezy, Grumpy, Dopey, and Doc. Name the seventh dwarf

23. How many hot dogs are in a standard package?

24. How many hot dog buns are in a standard package?

25. In which direction does the lettering run on a standard pencil (eraser to tip or tip to eraser)?

26. On which card in the deck is the card maker's trademark?

27. On which side of a venetian blind is the cord that adjusts the opening between the slats?

28. On the back of a $5 bill is the Lincoln Memorial. What's in the center on the back side of a $1 bill?

29. There are 12 buttons on a Touch-Tone telephone. What symbols are on the two buttons that bear no digits?
30. The names of what things are hidden on the back of a $5 bill? ———

31–32. There are two one-eyed jacks in a typical deck. Which jack faces right which faces left? ———

SCORING 29–32, excellent; 26–28, good; 21–25, okay; 17–20, fair

HERE'S-YOUR-PROFILE PROFILE

Here are some familiar faces and figures. In which direction do they face? Are they looking to your left or your right?

1. The Camel cigarettes camel ———
2. The Morton salt girl ———
3. The Ford Mustang ———
4. Alfred Hitchcock's self-caricature ———
5. The Playboy bunny ———
6. The Mona Lisa ———
7. Whistler's mother ———
8. Johnnie Walker ———
9. RCA's 'His Master's Voice' dog ———
10. The Arm and Hammer baking soda arm ———
11. The eagle on the Great Seal of the United States ———
12. George Washington on a quarter ———
13. Goodyear tire (winged foot) insignia ———
14. The Löwenbräu lion ———
15. The Mercury Cougar ———

FOLLOW-THE-DIRECTIONS QUIZ

Circle one

1. In which direction do pieces travel around a Monopoly board, clockwise (c) or counterclockwise (cc)? (c) (cc)
2. In which direction does a merry-go-round turn? (c) (cc)
3. In which direction do revolving doors turn? (c) (cc)
4. In which direction is the usual flow of people around a skating rink? (c) (cc)
5. In which direction was the chariot race in Ben Hur? (c) (cc)
6. In which direction do tornadoes and hurricanes spin in the Northern Hemisphere? (c) (cc)
7. In which direction is water supposed to drain from a sink in the Northern Hemisphere? (c) (cc)
8. In which direction do most people spin a hula hoop? (c) (cc)
9. What is the direction of travel in the Indianapolis 500? (c) (cc)
10. In which direction do the arms on a Nazi swastika point? That is, in which direction does the swastika's center appear to be turning? (c) (cc)

SCORING 9–10, excellent; 8, good; 7, fair; 6, poor; 5, chance

Answers on page 116

RUBIK'S UPDATE

Although we didn't ask for it, several readers sent in plans for a hypothetical mechanism that could be inside Rubik's Cube (September 1980). While many came up with ingenious designs that might work, no one reinvented the actual innards which we showed in the October 1980 column.

The 41-move solution we mentioned was proposed as a conjecture by Morwan Thistlethwaite of London's Polytechnic of the South Bank. It has not been confirmed. The best-known algorithm is a 52-move solution, also Thistlethwaite's.

David Singmaster, also of Polytechnic of the South Bank, reports that nearly 1,000 orders for his treatise "Notes on the Magic Cube" were received as a result of our column. Singmaster informs us that several people in the United Kingdom have been afflicted with 'cubist's thumb,' a painful condition affecting the hands of cube addicts, one person has even had to undergo surgery for it.

For most people a cube can be effectively randomized with four or five twists, but, Singmaster reports, it has been proved that there is at least one arrangement that is 18 moves away from the "start" position. Whether a cube can be more 'random' than this is not known.

Between the 52-move maximum and the 18-move minimum there is obviously room for improvement.

Ideal Toys, which markets Rubik's Cube, has recently published a "solution" available from Ideal at PO Box 72, Hollis, NY 11423, for $2 (New York State residents add the appropriate sales tax). Finally, we note the recent discovery that the permutations of the corner pieces of Rubik's Cube exhibit some of the basic properties associated with quark confinement. An article by University of Southern California Professor Solomon W. Golomb, "Rubik's Cube and a Model of Quark Confinement," is being prepared for publication. ☐
LAST WORD

By Art Dula

As rocket fuel, butter would put the federal support program for dairy products to better use.

A million in the problems facing the U.S. space effort will be resolved. NASA's next generation of launch vehicles should be fueled by butter. Here is a pumped liquid that maintains temperatures that could vaporize about the same thrust as the hydrocarbon fuel used by our Saturn V moon rocket. Butter is natural, organic, American made, and nonpolluting. But, best of all, if NASA used butter as a rocket fuel, perhaps Senator William Proxmire would become an enthusiastic supporter of our space program.

Senator Proxmire is from the "dairy state" of Wisconsin. Until the recent elections, he chaired the Senate Appropriations Committee, which controls NASA's budget. Although he is elected as a Democrat, Proxmire is really a politically astute populist. He invariably votes for the best interests of his own Wisconsin constituency. Unfortunately Proxmire has voted in the past supported spending for projects he considers to be far-out. His judgment on space solar-power satellites was, "Not one cent for this nutty fantasy! (One can only speculate why Proxmire's reaction would have been to the purchase of the Louisiana Territory from Napoleon or of Alaska from Czar Alexander.)

Proxmire's dislike of government spending for science in general, and for pure research in particular is so pronounced that he was recently sued successfully, for libel by a scientist whose research was ridiculed and who was given a Golden Fleece Award.

It is true that Proxmire's budget for the shuttle is over budget and years behind schedule. NASA's planetary programs, including the Jupiter orbiter and solar polar missions have been canceled or delayed. Last year, for the first time in NASA's history, no new programs were started. Instead, control of the major LANCST Earth observation program was shifted to the National Oceanic and Atmospheric Administration. NASA is plagued by a frustrating lack of direction. "The budget workers have already raided or taken "early out" options. NASA seems to be an agency without a future.

The butter rocket, our Proxmire Special, may solve these problems because their underlying causes are political, not technical or economic.

NASA has always been a political agency. The Kennedy Space Center is in Florida, rather than on the eastern end of Long Island almost entirely for political reasons. It was no accident that Lyndon Johnson was a power in the Senate when the manned space center was built in Houston.

In the mid-1960s NASA received about 2 percent of the federal budget purely because of its technical merits. The United States wanted a moon trip, and NASA would demand any resources it needed to do the job. Reliance on technical excellence presented the development of political savvy required to protect NASA's share of the federal budget. Once we got to the moon, other agencies, staffed with politically skilled administrators, went after NASA's budget. Did you know that the last several Apollo missions are being traveled despite the fact that all the hardware was built and ready to go? Yes, the Saturn V displays at the Johnson, Kennedy, and Marshall space centers are actual moon rockets we scrapped in the early 1970s because NASA didn't have the political clout to get enough money to get them off the launching pad.

How could the Proxmire Special cope with NASA's political problems? First, use of butter as rocket fuel would put the multi-billion-dollar federal price support program for dairy products to better use. Now money is spent to produce milk that is then powdered and sent to foreign countries where it is poured into the ground as a fertilizer. The Proxmire Special would allow American farmers to produce fuel-grade butter to maintain U.S. leadership in aerospase technology. The Proxmire Special is environmentally safe. Butter is non-toxic. The launch of a Proxmire Special would not pollute. A fleet of Proxmire Specials would burn less butter than the kitchens of any borough in New York City do. The use of U.S. butter by the Proxmire Special would eliminate NASA's present dependence on imported hydrocarbons. The imported oil could be used for production of gasoline and home-heating oil. The Proxmire Special would make the American farmer a vital part of commercial space development.

As business ventures into space, butter could be supplemented by alcohol and other agriculturally produced fuels. This could put to use even more federal money that is now being squandered. The government would still buy grain as it does today but instead of being stored at high cost, this grain surplus could become a space transportation surplus. NASA could make money by launching satellites at 50 million a shot. American farmers would no longer be forced by economic necessity to sell grain to the USSR. Rather, they would march on Washington, D.C., in a tricolor and demand permanent moon bases and manned Mars expeditions. When the American farmer's future is tied to the space program's success, it is reasonable to expect legislators like Proxmire to understand finally that it is good for the United States if NASA has all the funds it needs to subsidize the commercial development of space by free enterprise.

Last November the American people voted to change the fundamental direction of the U.S. Senate. Senator Proxmire is no longer in charge of NASA's appropriations. It is time for Americans to become actively involved with their space program.

Art Dula is a Houston-based attorney whose practice is devoted exclusively to aerospace and technical law.