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SPECIAL REPORT

THE SOVIETS' SPACE STATION

ARTHUR C. CLARKE: BEYOND 2010

PLUS

MARVIN MITCHELSON, F. LEE BAILEY, MELVIN BELLI, AND WILLIAM KUNSTLER ON

HIGH-TECH CRIME

DAVID STOCKMAN

FUTURE FINANCE, SPACE, AND THE POLITICAL ROLE OF CORPORATIONS

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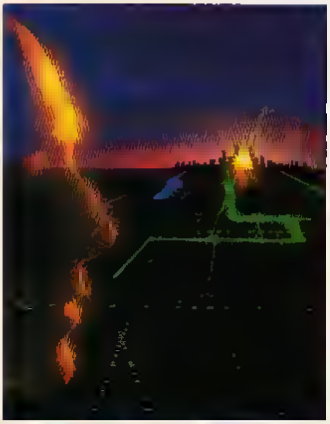

Michel Tcherevkoff, one of New York's foremost advertising photographers, designed this month's cover for Harper & Shuman, a software company. The artist shows the architect's mind at work—a brilliant sun rises over a cityscape that exists only on blueprints.

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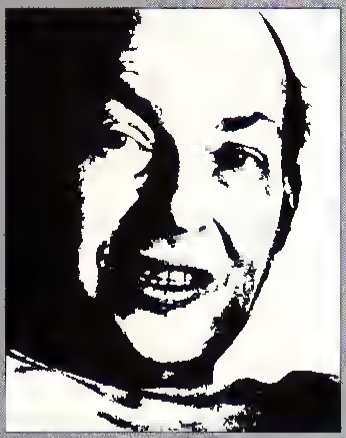

FIRST WORD

By Marvin Minsky

"We glorify our Newtons and Einsteins but take for granted the powers of common sense that loom far above the sciences and symphonies we celebrate."

What if some visitor from space had come a billion years ago to judge the fate of earthly life from watching clumps of cells that hadn't even learned to crawl? Would it have claimed that nothing good could ever come from things so crude? That's how people often feel when scientists say that we're machines or that machines could be like us. A person *ought* to feel aggrieved when compared with any *known* machine. People think, machines just perform. Our human forms move gracefully; our robots jerk and clank. We sense, experience, and understand; computers only execute their mindless, heartless processes. To be compared with things like that insults our sense of self-respect. But the time has come to change that view, for the question no longer is whether minds are machines but *what kind of machines?*

Before we learn to appreciate machines, however, we must overcome some obstacles. Our very words are out-of-date. For centuries *machine* referred to simple things like gears and pumps; *computer* added little more than doing dull arithmetic. *Mechanical* meant unconcerned, unfeeling, and emotionless—or mindlessly committed to some single cause. This image of stupidity and inhumanity made it easy to say, "No computer can do (xxx), because it has no feelings or thoughts." But such sayings turn to foolishness when we update them to reflect more modern views: "No computer can do (xxx), because it can only execute a myriad of processes that learn to build structures for representing many realms of knowledge and experience." Eventually we'll see our machines compose wrong theories of how they work—and then complain at being called machines.

Why does that seem humorous? I think it is because our humanistic tradition, while pretending to appreciate the human intellect, has taught us only to speak of the mind in terms of a spirit and a soul. This leads us to the attitude that we have no merit in ourselves, in our own biological machinery, but merely serve as vessels for containing things from somewhere else. In other words, we're taught that our own virtues are vicarious when they're in fact quite impressive.

Consider the following example. When you meet a stranger, you quickly get an impression—perhaps that this person is attractive, disagreeable, trustworthy, and so forth. And whether these impressions turn out to be useful or wrong, our culture leaves us shamefully unable to explain how they are formed. We're virtually unaware of the vast arrays of memories and processes that we build and use to represent the arrangements and relationships involved with human gestures, postures, and nuances of expression—and this ignorance forces us to talk about intuitions and vibes as though the products of our processes had origins outside ourselves. How crude to catalog the stranger standing before you as merely a list of familiar traits when you are actually facing a magnificent trillion-synapse information process that embodies the conceptual heritage of an entire culture: a vast mechanical masterpiece far more complex than any cathedral or symphony.

Consider how perniciously the humanistic tradition deprecates our abilities by speaking of the "spark" of creativity as though our best accomplishments could come from something trivial. We shouldn't let our envy of distinguished masters of the arts distract us from the wonder of how each one of us gets new ideas. No normal person has any need to apologize for not inventing marvelous things. The child in every one of us invents a universe of great ideas embodied in the intricate machinery constructed in each different brain. We glorify our Newtons and Einsteins for adding to our heritage of ways to describe matter, space, and time, but we take for granted every child's invention of conceptions of people and places, space and time, and many other ordinary things. The powers of these "common-sense" concepts loom far above those of the sciences and symphonies we celebrate. Before we try to estimate the merits of a masterpiece, we first must understand how little children make their sketches and tunes. Then when we're told that there are great differences between a genius and an ordinary person, we may see this as merely the sort of illusion that comes from standing too close. Perhaps it is merely a few accidents and incidents that lead certain individuals to learn more and better ways to learn.

I suspect that we cling to superstitions about creativity because they make our own shortcomings more excusable. As in the fable of the sour grapes, we use the claim that masterful abilities are unexplainable to console ourselves by declaring that our superheroes simply come endowed with qualities we don't possess. *If it isn't learned, it isn't earned.* When seen this way, the humanistic view seems based on envy, not on sympathy. To say that heroes bear the sparks of genius insinuates that they merely received the better "gifts" and deserve no special praise for their accomplishments; nor should the rest of us be blamed for our deficiencies. Let's face ourselves without the fear that finding out what makes us work may leave us filled with emptiness; there will always be more mysteries. OMNI

Marvin Minsky's long awaited treatise on artificial intelligence, The Society of Mind, will be published by Simon & Schuster in 1987.

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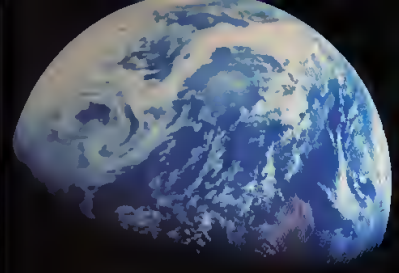

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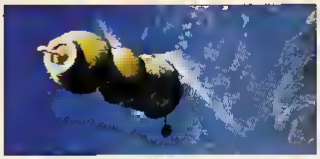
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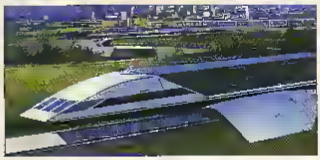
TECH TREK


LISTENING TO BRAHMS


CYBER CITY


DEATHSCAPE

When Neil Armstrong stepped off the ladder of *Apollo 11* and onto the lunar surface something changed in the human spirit. Suddenly the impossible had become reality. It was a day—July 20, 1969—to be remembered. But perhaps the triumphant mission to the moon would dissolve into the technofilled consciousness of the twenty-first century. This thought, which crossed the visionary mind of *Arthur C. Clarke*, led him down the conceptual path to his latest book.

Using the historic date as a focal point, *Arthur C. Clarke's July 20, 2019: A Day in the Life of the Twenty-first Century* (Macmillan, October 1986) depicts the state of society on the fiftieth anniversary of the Apollo landing. No small undertaking, so Clarke enlisted the aid of a well-trained crew of *Omni* contributors. Each writer looked at various areas—robotics, medicine, and sex, to name a few—and the result is a book of daring predictions and finely drawn scenarios of life in the not-too-distant future.

Take a look at our first excerpt, for example. *Erik Larson's* "House Arrest" (page 44) takes readers on a tour of tomorrow's living quarters. These computerized dwellings will do more than control the environment or even sense and alter moods. On call 24 hours a day, they'll be caretakers and confidants, developing an intimate rapport with their inhabitants. So how will these sentient homes react after years of devotion when their owners decide to move?

For answers we enlisted the opinions of notable attorneys *F. Lee Bailey, Marvin Mitchelson, William M. Kunstler* and *Melvin M. Belli*. And we asked, How would you defend a home accused of deliberate misconduct? The possibilities are endless. These barristers relished the idea of treading unbroken legal ground. In Belli's San Francisco offices, for example, lawyers spent hours arguing precedents and preparing hypothetical briefs.

Our second excerpt, "Tech Trek" (page 48), is *T. A. Heppenheimer's* report on the shape of future travel. By 2019 we'll see developments like sleek, supersonic jetliners, the next century's successors to the Concorde. They'll carry nearly five times as many passengers and cruise at more than three times the speed of sound. And on the ground, such automakers as Chrysler and Nissan will be producing plastic cars shaped like eggs and equipped with electronic road maps and collision-avoidance systems.

David Stockman, the former White House budget director and ideological leader of the conservative economic revolution, trains his keen eye on the future of government. In this month's Interview (page 72) *Peter Manso*, author of *Mailer: His Life and Times*, steers Stockman onto such diverse subjects as the federal deficit in the year 2000, the growing political role of corporations, and the economic effects of the space industry.

Given the current disarray at NASA after the *Challenger* disaster, the Soviet Union may have at least seven years of space-habital experience by the time the United States has its own orbiting station, according to writer *Andrew Chaikin*. In "Life in Orbit" (page 66) Chaikin, who was in Moscow for the Halley's Comet flyby earlier this year, explores the aspirations of the Russian foray into the solar system, including a mission to Mars that might benefit, he says, by a joint American–Soviet effort.

In this month's fiction selection *Suzy McKee Charnas* offers "Listening to Brahms" (page 56), an epic tale of reptilian aliens who assimilate human culture. "The initial idea for the story literally came from a conversation I overheard at a concert," says the author of *Dorothea Dreams* (Arbor House). "But I was able to write it only after I had a dream in which a lizard spoke to me."

The creative process takes many forms. H. R. Giger, for example, releases unconscious images and fears to create an art of the fantastic and the bizarre like that featured in the pictorial "Deathscapes" (page 80). And in the pictorial "Cyber City" (page 60) senior editor *Douglas Colligan* describes an atypical Parisian museum. Rising from the ruins of an abandoned cattle market, it's an interactive, high-tech showplace as well as a bold experiment in urban planning.

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LETTERS

COMMUNICATIONS

Remembrances of Things Lost

I have finally read an article—"What Ever Happened to Edmund?" [Explorations, June 1986]—that inspired me to respond. As a kid I read, collected, and cherished the *Edmund Scientific Catalog*. Until recently I had issues dating back to 1960. Every so often I would open up one of them and take a pleasant trip back to my childhood, when a simple prism seemed better to me than any pirate's treasure. But after an energetic spring cleaning, these "time capsules" were buried forever in the Los Angeles city dump.

When I get nostalgic I remember the pages and pages of wonderful, magical attractions: diffraction gratings, motors, lenses, magnets, lasers, jumping discs, holograms, fiberoptics, liquid crystals, microscopes—even the Big Ear. Besides an imagination and a little money, all I needed was *Edmund*. Even a twelve-year-old kid could put Rube Goldberg to shame. Good luck to the "tummy flattener" designers and engineers the new catalog will produce.

Rich Fernald
Los Angeles

Alzheimer's Children

A. J. S. Rayl's article on Alzheimer's disease ["Brain Master," June 1986] was very encouraging. It's not easy to watch a person disintegrate before your very eyes. My mother is sixty-two years old, and after four and a half years of trying to make it at home, she has just been placed in a nursing home. Her situation is particularly poignant. She was formerly head nurse in the home where she is now a patient. Even if it's too late for my mother to benefit from Dr. Harbaugh's treatment, there are other sons and daughters—as well as patients—who may be spared the effects of this cruel disease.

Paul Pape
Studio City, CA

Fly Me Down Under

Tom Weller says it takes 38 minutes to tunnel through the earth to the other side ["Last Word," June 1986]. The actual travel time is 42 minutes—and 84 minutes for the round trip. The period of oscillation of a small mass in a tunnel through the center of the earth is exactly the same as the orbital period of a small mass in a circular orbit at the surface of the earth, which is 84 minutes.

Also, it takes 42 minutes to travel through a tunnel connecting *any* two points on the surface of the earth. A tunnel between New York and Los Angeles could be dug to a depth of "only" 300 miles, and it would still take 42 minutes to go between the East and West coasts.

If you really want to shorten the travel time, the shape of the tunnel is more important. By using a curve called a hypocycloid, the New York–Los Angeles time can be decreased to just 28 minutes.

John E. Prussing, Professor
Department of Aeronautical
and Astronautical Engineering
University of Illinois
Urbana, IL

In the Eye of the Storm

In "War of Winds" [June 1986] the author, John G. Fuller, gives the impression that NEXRAD is the only early-warning system against tornadoes. But an excellent program with a remarkable track record has been in operation for more than ten years. It's called Skywarn.

The National Weather Service (NWS) trains spotters, as we are called, to watch for telltale signs of tornado activity—areas of inflow, updraft, rotation, and wall clouds. Spotters are amateur (ham) radio operators who communicate with the NWS. During the Wichita Falls tornado of 1979, with 18,000 people in the direct path of the mile-wide tornado, only 44 people were killed—and most of these deaths occurred because people left shelters. Skywarn spotters gave Wichita Falls a 15-minute warning. We're the national eyes of the weather service and a valuable link in the early-warning chain. The more spotters in the field, the greater the chances of preventing death. The training is free; all you need is an amateur radio license.

Mike Vanhooser
Lewisville, TX□□

DIALOGUE

FORUM

Omni invites you to use this column to voice your hopes about the future and to contribute to the kind of informal dialogue that provokes thought and generates breakthroughs. Please note that the opinions expressed here are not necessarily those of the magazine.

Earthly Power

In March 1979 my wife and I were trekking deep in the Himalayas—out of touch with civilization. Along with a handful of Sherpa guides we were headed toward the base camp of Mount Everest. While we were camped at about 14 000 feet a runner carrying mail from Kathmandu suddenly joined us by our tent and said "Do you know a place called Harrisburg in your country? Big trouble. People run away. Big atom." That was the extent of the news. I knew it couldn't have been an atom bomb because the whole world would have been at war.

A month later, back in Kathmandu, I learned about the accident at Three Mile Island. I heard about the nuclear accident at Chernobyl in a more conventional way—on CBS radio. In both instances I was half a world away, but the news once released traveled fast.

I was writing a book called *We Almost Lost Detroit* when the accident occurred at Three Mile Island. I was reporting on a nuclear accident and partial meltdown in Michigan in 1966—what turned out to be a fateful prelude to Three Mile Island and Chernobyl. After a year's research on the Michigan meltdown I arrived at one conclusion: Future nuclear accidents were inevitable, and the people inside the industry—health physicists, nuclear engineers, "red iron" workers on the construction gangs—knew it. What they said was a far cry from the slick and reassuring commercials released by the utility companies.

I believe that the Atomic Energy Commission (AEC) deliberately covered up the dangers of nuclear power. The American public has not been privy to studies commissioned by the AEC. Through the Freedom of Information Act, I obtained more than 1 200 pages of minutes, letters, and memos transcribed from closed-door sessions of the AEC.

In a 1957 AEC study called WASH-740 scientists estimated that a meltdown in an average size reactor would cause 3 400 deaths and 43 000 injuries and would cost $7 billion in property damages. WASH-740 was updated in 1964 and forecast 45 000 deaths, 73 000 injuries, and $17 billion in property damages. The study stated that an area the size of Pennsylvania would be totally contaminated and destroyed. The threat of a lawsuit under the Freedom of Information Act finally forced the AEC to reveal its findings in 1973. Committee members had felt the projected figures were too horrifying. It's ironic that the study was commissioned to convince the public and reluctant insurance companies that nuclear power was safe. Insurance companies would not sell a dime's worth of insurance to protect people or property against a nuclear disaster.

The projected figures led pronuclear physicist Edward Teller to say, "No nuclear power plants should be built above the ground." And W. D. Claus, a member of the AEC's division of biology and medicine, questioned the direction of the report because it had no basis for attaching a money value to a holocaust."

Why, in the face of such potential disaster, has the nuclear industry moved ahead? It is hard to understand why the protest movement has not grown more powerful. I am convinced that ordinary citizens around the globe are *very* misinformed. To this day no family or person in the world can find an insurance company foolish enough to protect them from a nuclear-power-plant accident. This fact mocks the dulcet public-relations statements issued by our utilities.

The nuclear industry throughout the world, regardless of politics, has been engaged in a concerted effort to cover up the risks of nuclear power. It is naive of us, whether we live in the United States or the Soviet Union, to accept the promises of people motivated by profit or prestige.

The Nuclear Regulatory Commission, the organization that replaced the AEC, has reluctantly admitted that in the next 20 years there is a 45 percent chance of a nuclear accident with an accompanying meltdown occurring in this country. They have also admitted that the Chernobyl reactor was better designed than they had first believed.

Smugness and self-satisfaction can never pay off in the face of a fickle and unpredictable force such as nuclear power. It must be harnessed by infallible people if it is to be harnessed at all. So far the utility companies have not found such a person.

John Fuller
Weston, CT

The nuclear accident at Chernobyl was one of the most frightening events in recent years. Along with the numerous human fatalities and injuries there are countless other damages. The accident is surely going to cost the world economy billions of dollars. Consider the problems of the consumption and exportation of food stocks in vast areas of Europe, the "temporary" loss of grazing lands and standing crops, and the loss of housing and jobs in the vicinity of the site.

The ecological damages are frightening. A small portion of our Earth has been damaged for generations to come. The scars of radiation take a long time to heal. I hope that some positive results will occur. The world has been awakened to the horrors of nuclear accidents and reawakened to the danger of nuclear war. Virtually every nuclear reactor in the world is undergoing intensive safety inspections. Engineers—and I include myself in that category—are taking a harder look at the safety of their designs, be they chemical processes or nuclear power stations.

Almost everyone, from the youngest student to the oldest citizen, has a better appreciation of global ecology. We will learn from this tragedy, and the world will be safer for it.

Roger C. Thibault
Publisher
Artificial Intelligence Today
Elkview, WV

SHUTTLE HYBRID

SPACE

By Randall Black

Soon after the manned space shuttle was designed, space engineers realized that parts of the space-transportation system—the solid rocket boosters, external tanks, and main engines—could be combined to create unmanned rockets. Known as shuttle-derived vehicles (SDVs), an entire family of these reusable launchers could be built from off-the-shelf shuttle hardware to accommodate a variety of payloads.

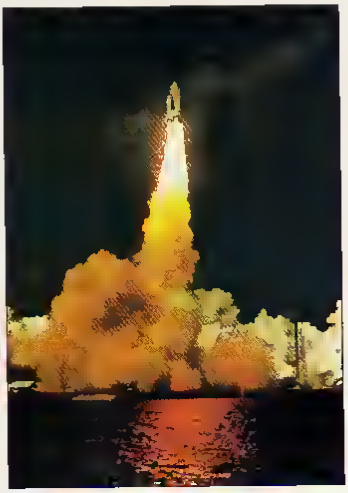
Before the *Challenger* accident, interest in SDVs was motivated primarily by economics. They can carry a larger payload to orbit for less money than the shuttle can. With the massive orbiter removed and replaced by a cargo canister, one type of SDV, for example, can loft into orbit up to 400,000 pounds, as compared with the 65,000-pound payload of the manned orbiter. A joint NASA–Defense Department study pointed out that an unmanned, partly reusable cargo vehicle making 30 launches per year with three times the cargo space of the shuttle could deliver satellites to low Earth orbit at half the current cost.

NASA's almost complete reliance on the shuttle has left the space program in a state of limbo, delaying important payloads slated for launch in 1986 and throwing into disarray any payload plans for next year. In the present vacuum, the demand that NASA develop greater unmanned launch capability has rekindled interest in SDVs.

In 1984 a National Research Council (NRC) panel on space worried about the possibility that what it termed a "generic failure" in the shuttle program could shut down the nation's ability to conduct space launches.

Finally, last spring, in light of the *Challenger* disaster, the NRC's Space Science Board, which advises NASA and Congress, recommended that the United States abandon the shuttle as the primary launch vehicle for scientific payloads. According to the board's chairman, Thomas M. Donahue, "Trying to use the shuttle as a general-purpose launch vehicle that provides our only access to space is not wise." The council advises that NASA immediately take steps to join the Air Force in acquiring upgraded Titan boosters. "The shuttle-derived vehicle might be very useful in the future," Donahue says.

SDVs can be divided into two basic types: the "in-line" version, in which the payload rests atop the external tank, and the "side-mount" version, with the cargo canister attached to the tank's side. For small payloads an SDV could consist of a trio of solid rocket boosters (SRBs). Larger loads would require SDVs with up to three space-shuttle main engines (SSMEs) and a large external tank to supply them with liquid hydrogen and oxygen. The most powerful SDV studied would have an expendable third-stage engine. Supplied with a smaller propellant tank, the added rocket motor would begin its burn after the other engines had dropped away. "That would give a gross improvement in payload capability from two hundred fifty thousand to four hundred thousand pounds above that of the standard two-stage SDV," says Bob Marshall, director of the shuttle program at NASA's Marshall Space Flight Center in Huntsville, Alabama.



Shuttle: Are the parts better than the whole?

Reusability is a common advantage of all SDVs except, of course, those with a throwaway third-stage motor. "The major cost in launch systems turns out to be the disposable components," says Marshall. "Rocket engines today cost about thirty million dollars apiece." Unlike the expendable rockets now used, an SDV would have the expensive main engines and flight electronics all located in a detachable pod that could be recovered. After launch the engines could be left in orbit and retrieved by a manned shuttle. Or the jettisoned engine electronics pod could be fitted with parachutes and a simple reentry shield to fall back to Earth. Or finally, the engine pod itself could be a wingless, maneuverable "lifting body" similar to the shuttle orbiter, capable of flying back for a controlled landing on a desert airstrip.

According to Marshall, building a fleet of SDVs to replace NASA's aging unmanned boosters would cost only 25 percent of the amount needed to develop a new expendable launch system. Moreover, the SDV would support the manned shuttle program by reducing costs for shuttle hardware because shuttle components could be bought in bulk. Likewise, buyers could take advantage of a phenomenon called the learning curve—as a contractor's expertise in manufacturing techniques grows, the production costs drop. Finally, since the agency would be buying shuttle parts in bulk, the price per item of shuttle components would drop. Even at present component prices the unmanned craft is considerably cheaper to build. One feasibility study of SDVs done by the Martin Marietta company estimated that an unmanned cargo carrier could be built for about $2 million, as compared with the estimated $2.5 *billion* a shuttle costs.

As the shuttle program is rebuilt, the parallel development of a reusable unmanned partner designed to perform routine launches could reserve manned flights for missions in which people are really needed in space.

THE ARTS

By Kevin McKinney

When I began writing this article I knew exactly what I wanted to say and how I would say it. But the words seemed trapped in my mind. In frustration I began over and over again, producing nothing but pathetic drivel. Then I decided to experiment with automatic writing.

Resting my fingers on the computer keyboard, I closed my eyes and strained to divorce myself from consciousness, gradually entering an almost trancelike state. Oblivious to my surroundings, I soon began a slow digital dance, and before long words gushed forth. At last I had broken through the mental barriers that had blocked creativity. The Muse had been released.

Perhaps fortunately, the Muse was the only one I contacted. If at all possible I might have broken through to the other world and gained some universal knowledge. But that would not have surprised psychic expert Ruth Montgomery, a prolific spokesperson for the spiritual plane.

For more than 25 years, Montgomery professes, she has been communicating with incorporeal beings through automatic writing. She has disseminated their wisdom in nine books, including *Threshold to Tomorrow*, *A World Beyond*, and *Aliens Among Us*. And in her recent autobiography, *Ruth Montgomery: Herald of the New Age* (Doubleday/Dolphin), she details the process of creating each of her books and her conversion from skeptic to believer.

When Montgomery discovered automatic writing, the idea wasn't new. Automatism, first formulated in the Twenties by French poet André Breton, was designed to free the human unconscious and issue spontaneous imagery. Following the teachings of the artistic innovator, surrealists like Salvador Dalí produced fantastic and incongruous effects. Even Gertrude Stein, as a student of psychologist William James, researched and studied it.

In more recent years, writers like Francine du Plessix Gray (*Lovers and Tyrants*) and Suzy McKee Charnas ("Listening to Brahms," page 56) have undertaken the exercise to clear the mind's cobwebs and free creative energies. "I sometimes close my eyes and let my pen float across the page in a stream of association," Gray says. "It's a kind of faith in the void, a search for layers of deeper discipline that might release us from everyday surface discipline."

Charnas has occasionally resorted to automatic writing when a story's progression seems impeded. "Sometimes the best way to overcome the difficulties is to simply allow the character to speak for itself, which in turn helps to better define that character," she says. In one case, Charnas allowed two characters—a vampire and his therapist—to freely talk to each other as she recorded every word. Then, using her professional craftsmanship, she refashioned the conversation as part of her award-winning novella *Unicorn Tapestry*.

But psychic writers like Ruth Montgomery aren't reaching down into the depths of their souls to stir the Muses. They contend they're contacting omniscient spirits. "Years ago, when all this beautiful philosophy was flowing, I wasn't convinced that it was anything more than my own subconscious thoughts," says Montgomery, who has also written numerous books without spiritual aid. "But I had to agree with the Guides who reminded me that I'd never had such incredible ideas in my whole life. I was reared in the Methodist church, and I had never heard the ministers say anything with as much depth. What's more, I research everything they tell me before I publish my books, and much of their information is verifiable. There is no way in the world that I could have known about it ahead of time."

Even though the 'Guides' provide the material that will become a Montgomery book, preparing the manuscript is no easy task. "Family members have jokingly said that anybody can write a book if they just sit down like I do and it's all given to them," she comments. "But besides confirming the Guides' information, I struggle to put it into a narrative context. I don't just parrot what they say."

Learning to communicate with the spirit world, Montgomery adds, was also a

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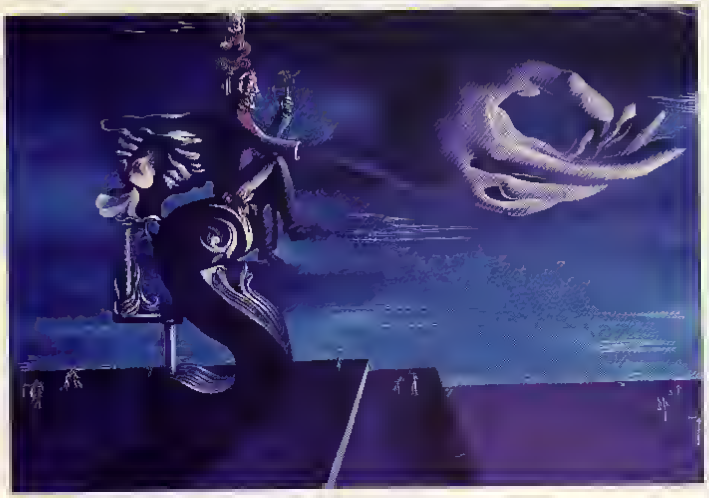


Dalí produced fantastic artwork through automatism. Montgomery contacts the spirit world.

LIFE

By Erik Larson

The first time the group got together they created a large ocean-covered planet inhabited by 30-ton whales. There was only one snag in their scenario. The whales would have to be able to fly if they were ever to encounter the human race. And that was the whole point of the exercise: to see how the two life forms would mesh in an initial meeting.

The whales were the first offspring of Contact, an annual conference that gathers science-fiction writers and anthropologists for three days of mental aerobics on how humans might handle a close encounter with alien beings. It is not your typical science-fiction convention with guests roaming around in Spock ears and Wookie masks. Instead, big-league writers and anthropologists present papers with such titles as "Science Fiction Cultures: Real and Ethereal" and "Biological Factors in Species Contact." They attend workshops on the techniques of creation—how to build an imaginary world, how to build an alien, how to build the culture that fits both. One of the best ways to understand something is to create it," says James J. Funaro, the anthropologist who founded the conference in 1983.

As a professor at Cabrillo College in Aptos, California, Funaro has frequently taught a course that uses science fiction to illustrate aspects of anthropology. Both pursuits, he contends, have a lot in common. "Anthropologists study alien cultures; science-fiction writers create them," he says.

The high point of each Contact is the Bateson Project, a subconference named after anthropologist Gregory Bateson, who died in 1980. During each Bateson Project a group of writers and anthropologists splits into teams to create a planet, an alien, and its culture. Each team meets from time to time throughout the three days of Contact and then, before the full conference audience, acts out the first encounter with an intelligent alien creature.

The teams build their worlds and creatures in strict accordance with the laws of physics and the constants that make cultures work. Larry Niven, a prominent science-fiction writer who builds his imaginary worlds atom by atom, and Jerry Pournelle, coauthor with Niven of several novels, act as hard-science gadflies to keep everybody honest. They are quick to point out flaws in logic, physics, or biology. At one Bateson meeting Niven looked over an artist's model of an alien. "The first thing I said was, 'Okay, where's the anus?'"

It's a tough crowd. But these battles over what is and isn't possible are what attract the writers and anthropologists. "We're all dealing with the theoretical side of how societies interact with one another," says writer Greg Bear. "The real benefit is the experience of sitting down with these people and breaking imagina-five bread."

The Bateson projects point out the difficulty of communicating with an alien culture. During one encounter a team produced the Squitch, a creature that communicated through dance. Under that scenario it took generations for humans to decipher the dance language and to develop a dance-communication machine. Contact participants also learn that communication should precede action. In the first Bateson Project the whales had found their way into space using gigantic craft filled with hyperoxygenated liquid. Man, meanwhile, had blown up Earth and retreated to space colonies. When human explorers stumbled on the whalelike aliens they couldn't tell the infants from the parents and blundered into the alien craft's nurseries. The otherwise peaceful whales rose to defend their offspring and promptly killed two of the three explorers.

To some Contact participants, these Bateson enactments mean a chance to rehearse the real thing. Someday they believe, man will meet an alien coming through the astral rye. Judging by the history of our behavior toward Earth's own alien cultures, we could use a little practice before that day. As Greg Bear explains, "We are literally preparing ourselves for when we are 'adults' for when the human race is out there playing with the big boys." OMNI

Talking to extraterrestrials: Anthropologists and writers plan for our first encounter

SS-433, WHAT ARE YOU?

STARS

By Richard Wolkomir

When they first noticed SS-433 eight years ago astronomers called it the "star that's both going and coming." It seemed to be rushing toward us at an incredible velocity. Simultaneously it seemed to be whizzing away from us at even faster speeds. clearly an impossibility.

Initially SS-433 appeared to be a humdrum member of the Milky Way's 100 billion stars. Today the star is considered anything but humdrum, and in the years since its discovery astronomers have been offering ever more complicated theories as to what SS-433 really is. Now in a change of pace, the newest theoretical explanation of SS-433 is also one of the simplest.

The first hint of the star's unique quality came in 1978. Then scientists at Britain's Royal Greenwich Observatory traced radio noise and X rays to SS-433. Under the scientists' scrutiny, the noisy star proved profoundly strange.

First there was SS-433's spectrum. When a star's light passes through a prism, it fans out into distinct colors. Its spectrum—SS-433's spectrum had strong "emission lines," indicators of the elements that make up a star. Such lines are supposed to be fixed, but SS-433's moved dramatically from day to day. As astronomer George W. Collins II of Ohio State University puts it, "The lines don't just move, they march!"

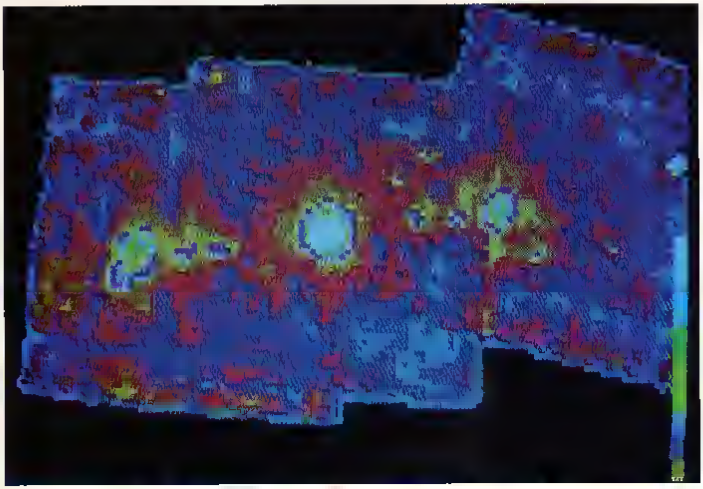
Then UCLA astronomer Bruce Margon discovered that SS-433's emission lines were shifting far from their normal position. Astronomers use such spectral shifts the way state troopers use radar to detect speeders. When stars move toward us, their light turns bluer; their spectra shifting toward the blue end. when stars move away from us, their spectra move toward the red side. SS-433 was a shifting chameleon. One group of its spectral lines was "blue shifted," a second was "red-shifted," and a third was virtually unshifted. SS-433 seemed to be simultaneously coming, going, and standing still. Now astronomers have reached a rough consensus about SS-433. Virtually all agree that the coming-and-going paradox stems from the star's bizarre configuration. SS-433 is a binary, or two-part, star system. The whole binary assembly spins like a water sprinkler. It has two jets of gas spurting from it, and at any moment one of the jets points toward our solar system and the other away from it. Thus the gushing, spinning jets make the star seem to rush both toward and away from the earth.

No one is sure what comprises the two parts of the star. According to the most popular theory, its hub is a huge, blue supergiant star. Orbiting this is a flat disc composed of material that has been sucked from the supergiant by another massive object, either a black hole or a neutron star (a star formed when an exhausted star collapses into an incredibly dense fist of matter).

George Collins and his Ohio State University colleague Gerald Newson reject the standard—what Collins calls canonical—theory. "The problem is the jets," says Collins. The jets wiggle like the tips of a wobbling top, and they act in sync with the vibrating blue supergiant. "There is nothing in the standard theory that could explain why a disc should do this," he says.

He and Newson believe that a blue supergiant exists at the hub of SS-433, but that there is no disc, no black hole, no neutron star. The star's companion is a helium main sequence star, one that has burned up its hydrogen and peeled down to an ultrahot helium core. Perturbed by the gravitational tug of the helium star, the blue supergiant wiggles and generates powerful electromagnetic fields that propel the jets, like cosmic rail guns, into space. Collins and Newson say the reason the jets mimic the wobble of the blue supergiant is because they are shooting directly from the poles of the blue giant itself. "I think we're seeing a phase in the evolution of certain types of rare stars, the blue supergiants, which last only a million years," Collins adds.

Whatever SS-433 is, it is decidedly peculiar, and it keeps its secrets well. "I've spent seven years trying to understand this thing," Collins admits, "and sometimes it seems almost malicious."



X ray photo of SS-433, the most awesome lawn sprinkler ever. Astronomers are still mystified.

CONTINUUM

HYPERCHARGED

While finishing the galley proofs last winter on our history of particle physics we were horrified to see a front-page article in *The New York Times* detailing a startling new discovery Two scientists from Brookhaven National Laboratory and the University of Washington had reanalyzed old experimental data and found tiny discrepancies that indicated the presence of a force that slightly counteracted gravity HINTS OF FIFTH FORCE IN UNIVERSE CHALLENGE GALILEO S FINDINGS ran the headline, Newton and Einstein were overthrown too

We couldn't have cared less about Galileo, Newton and Einstein *their* careers weren't in the balance It was *our* book that the news promised to devastate *The Second Creation* concerns the ongoing efforts to link the four known forces of nature into a single unified theory a fifth force would instantly outdate the whole thing To drive the point home our editor called His opening sally "Is it too late to cancel the contract?"

He was joking fortunately We picked ourselves up off the floor and calmly and rationally proceeded to panic, fantasizing about rewriting everything while the book was at the compositor's running up huge printer's bills, and driving our publishers crazy

We didn t do it. The book was too far along in the production process to do anything It came out without a single mention of the fifth force, sometimes called *hypercharge* And we re glad

Because even though the new force appeared on the front page of scores of newspapers across the globe few physicists think it exists In fact the fifth force is an object lesson in how supposed breakthroughs may often be just that—supposed—and how a vital part of the scientific process is skepticism

The history of the matter so far is this At the turn of the century the Hungarian physicist Roland Baron Eotvos of Vásarosnamény spent decades testing the laws of gravity with unparalleled skill and excruciating thoroughness, the measurements were hundreds of times more accurate than any performed before Galileo and Newton, Eotvös concluded were right

Recent measurements of the force of gravity inside the earth, however have shown deviations from Newton's laws To explain the discrepancy the Brookhaven and Seattle physicists went back to Eotvöss original data They found Eötvos's numbers in fact showed that different materials had different powers of attraction Moreover the agreement between Eotvoss data and the geophysical measurements was 'surprisingly good " Conclusion A new force—something besides gravity—is operating

Momentous, if true But as shown by MIT physicist Min Chen the consistency between the geophysical and Eotvöss data is *not* surprisingly good ' Because of a simple arithmetical error in the scientists' calculation, the two figures are off by a factor of ten, indeed they are surprisingly *in*consistent. Moreover, according to Richard Feynman a Nobel-winning physicist at Caltech any deviations from Newton's laws would already have been seen by the highly sensitive detectors in particle accelerators

The Brookhaven and Seattle scientists have already begun rebutting their critics, and rebuttals to these rebuttals are no doubt forthcoming The controversy has prompted a few experimenters to plan new tests of gravitation with the most sophisticated equipment available Good results should be available in 1987 or 1988—at the earliest The reason it will take so much time is that it is *hard* to do a good experiment as every person who has flubbed a high-school chemistry experiment can attest Eotvos spent half his life on his experiments

Our momentary alarm arose because we were ignoring the lessons of our own book, which chronicles many of the false breakthroughs that particle physicists made on the way to scientific truth Even the greatest of scientists have scores of wrong ideas for every right one The first experiments on a new subject are often flawed Similarly theories are more frequently wrong than right, for the simple reason that there are many theories but only one true answer Only later did we realize that scientists today make as many mistakes as their predecessors did and that the odds are overwhelming that the fifth force will fall into the limbo reserved for fundamental discoveries that didn t pan out

In 1984 we asked Sheldon Glashow a Nobel prize-winner at Harvard for his reaction to a putative new physics discovery called monojets It s wonderful " he said Of course, it s probably wrong but that doesn t mean it's not wonderful I love a flap, don't you?" The monojets do not after all seem to exist. The jury is still out on the fifth force

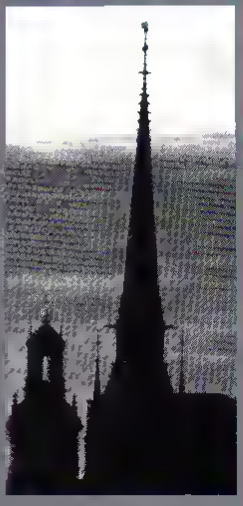
If you pick up a newspaper with an account of the next scientific sensation remember to think *How wonderful* And *How probably wrong*—*CHARLES C MANN AND ROBERT P CREASE*

CONTINUUM

SWEDISH HEAT PUMP

The thrifty Swedes, long famed for their ability to produce cheap power, have come up with yet another way to bite the energy bullet. This time they have put together what amounts to the world's largest heat pump, using as a primary energy source nothing less than the cold, cold waters of the Baltic Sea.

The system, explains Jan Sgodein of the Swedish Energy Board in Stockholm,



Stockholm: 300,000 buildings heated by the cold Baltic

is elegantly simple. Water from the Baltic Sea is first pumped over a series of pipes containing liquid Freon. Even at its coldest (roughly 2° C) the water is much warmer than the Freon, so as its heat passes through the pipes it warms the Freon, eventually evaporating the liquid and turning it to gas. That gas is then further heated by compression until it warms the pipes that contain it to 85° C. Those pipes in turn pass their warmth along to heat the water that heats the flats of Stockholm.

The power produced by the heat pump, Sgodein says, costs only about half as much as power produced by fuel oil. Placed online in January, the system is already providing heat for 300,000 homes and offices in the Stockholm area. Theoretically, Sgodein says, this heat pump could be a model for the Third World, especially for tropical countries where the water is much warmer than it is here."

—Bill Lawren

THE IMPORTANCE OF LITTLE PEOPLE

Children all over the world revel in tales of mischievous "little people"—the gnomes, fairies, sprites, and leprechauns of folklore—and frequently invent imaginary little playmates that only they can see.

"The fact that little people are common to every culture tells me that they are of tremendous importance in childhood development," says pediatrician Karen Olness, research director of the Minneapolis Children's Medical Center. "The ability to conjure up little people appears to nourish a healthy imagination necessary for problem solving in adult life."

Olness explains that scientists have yet to understand how internally visualized images become external ones. But we do know that philosophers and priests in ancient cultures, as well as artists and scientists of our own time, have used imagination as a tool for growth and creativity—and in many cases they've specifically used images of little people." For example, Albert Einstein claimed he came up with his relativity theory by imagining himself as a tiny being riding on a ray of light. Robert Louis Stevenson said that as he slept, brownies, the little people of Scottish folktales, came to him with ideas for the plot of "The Strange Case of Dr. Jekyll and Mr. Hyde."

Dorothy confronts the munchkins in The Wizard of Oz. *The ability to conjure up little people may enhance problem solving in adult life.*

Unfortunately, as most people grow from childhood to adulthood, they lose not only their belief in little people but their strong imaginations as well, says Olness. But if we could retain childlike imagining abilities, she suspects, we would become more creative and perhaps even make ourselves healthier.

"We've documented how some children can control certain physiological processes previously believed to be autonomic by using their imaginations," Olness explains. For instance, some youngsters in a controlled study were able to raise the temperature of their fingers by imagining they were wearing heavy mittens.

"It is reasonable to think children may be able to learn to control their immune processes by using this kind of visualization. And if they can preserve their imagery skills as they grow up, we may one day evolve into a society where we can increasingly control our own physiology."

In the meantime, Olness urges adults as well as children to stimulate their imaginations by reading a 'little people' story or two.

—Sherry Baker

"No animal admires another animal."

—Blaise Pascal

Asteroid in Earth orbit. Asteroids may exist in other solar systems, particularly those that are centered on white dwarf stars.

ASTEROIDS IN OTHER SOLAR SYSTEMS

A professor of theoretical astrophysics at the Massachusetts Institute of Technology hints that he may have found evidence of the first asteroids beyond our solar system. These asteroids, says Charles Alcock, may orbit white dwarf stars.

Spectroscopic observations of white dwarfs, which are small, extremely dense stars, show an abundance of heavy elements—those heavier than helium—on their surfaces. One explanation is that these substances may have come from the gas and dust between the stars. But this interstellar medium is mostly hydrogen, and little or no hydrogen shows up on some of the white dwarfs.

So where are the heavy elements coming from? A surrounding ring of asteroids, Alcock says. The asteroids of the solar system have essentially no hydrogen in them, but they contain a lot of the heavy elements that are seen on the white dwarfs. It's plausible that the white dwarfs are getting their heavy elements from an orbiting asteroid belt.

Alcock's theory is that as the extrasolar asteroids crash into one another, small particles fly off and fall into the white dwarf. This happens in our own solar system, so it probably occurs elsewhere. The only problem: Could asteroids survive the star's red-giant stage (a precursor to the white dwarf stage) when it swells up and engulfs its inner planets?

"In our own solar system, the asteroids probably would be burnt up," Alcock says. "But in another system, the asteroids might be twice as far away from the center of the star, and in that case they'd be quite secure."

—Edward Regis, Jr.

MORSE CODE IN THE BRAIN

Nineteenth-century brain scientists postulated centers in the brain for a whole slew of abilities, but here's one they missed: Morse code.

Morse code? A recent case reported in the journal *Brain and Language* concerns a fifty-four-year-old male amateur radio operator who suffered a hemorrhagic contusion of the left temporal lobe as the result of a fall. He was not knocked unconscious, and aside from some hesitation in speech, neurologic findings were normal.

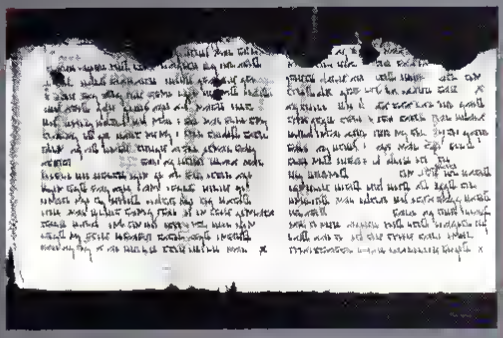
Normal, that is, except that his ability to send and receive Morse-code messages was reduced from 40 words a minute—his level for the past five years—to seven words a minute.

Does this prove there's a "Morse code center" in the brain? Probably not, according to the report. "To receive Morse code at forty words per minute requires a high degree of auditory discrimination and ability to detect temporal sequences," write the authors. Many studies show the left temporal lobe to be especially proficient in these skills. Given that language is a multimodal faculty, the disruption of one component, rapid and efficient temporal processing, may have had its greatest effect on an aspect of language—Morse code—in which temporal processing is the major feature.

Is there a center in the brain devoted to Morse code?

—Laurence Miller

CONTINUUM



Dead Sea Scrolls The records of our microchipped Information Age may wind up as inaccessible to future generations as were the scrolls

WILL WE BECOME A LOST CIVILIZATION?

Archivists like David J Murrah, director of the Southwest Collection at Texas Tech University are worried that records of our computerized microchipped Information Age may wind up buried in technological caves as inaccessible to future generations as were the Dead Sea Scrolls

'Modern technology, with all of its wonders has created a nightmare for all of us charged with storing information ' says Murrah, who blames technological obsolescence for the problems facing today's archivists and tomorrow's historians "Progress is forcing archives into becoming virtual museums for recording equipment," he says "To maintain the information we've got to maintain the equipment But the equipment changes continually, and we must either change the information from one format to another or risk losing it The irony of it all is that the best thing we can do is to put the important information on paper That s still the most usable and easiest way to preserve most information "

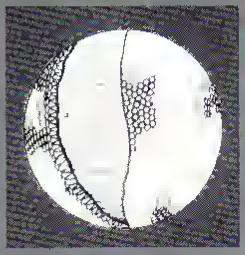
The trouble is that modern technology has created paperless records such as sound recordings, films microforms, and computer disks, Murrah says But film becomes brittle, and videotape has a short life expectancy Technological advances come so fast, he adds that they have ' turned the world of the historian upside down Maybe we should preserve the machines and create a museum of machines' so that future generations would have a way to understand twentieth-century life

"Historians of the future may be able to re-create more of nineteenth-century life than twentieth-century life because those records are more permanent and accessible " Murrah says "Hopefully, modern technology will help us find a way to preserve our heritage but to date, it has only broadened the scope of the archivist's job I suspect that we would do well to go back to paper We must become experts in maintaining and transferring information in a format that can be understood and used in the future "—George Nobbe

"There is no greater disadvantage than greed "
—Lao-tzu

TIME CAPSULES

One of the most vexing problems in giving medication is that drugs don t stay put The circulatory system distributes them The result is that cancer therapy drugs poison parts of the body other than tumors and anesthetics wear off as the body dilutes them Now two researchers have developed microscopic capsules that release drugs slowly and to specific locations



Cutaway view of microscopic anesthetic drug droplets

The researchers—University of Illinois anesthesiologist Dr Anthony Kirkpatrick and pharmacologist Duncan Haynes of the University of Miami—give the following recipe for making the capsules Into a blender put a special formulation of lecithin, a fatty substance found in human cells Add sugar water and any one of a vast variety of oil-based drugs Homogenize the mixture Then subject it for 15 minutes to a high-energy sound device that emits an unbearably loud screech

The effect is the laboratory version of shaking a bottle of salad dressing The oily lecithin forms millions of microscopic droplets that encapsulate the drug The capsules—one eightieth the diameter of a red blood cell—get logjammed between the tissues being treated and the drug leaches out very slowly

The scientists successfully tested the capsules with a common anesthetic on lab rats and human volunteers Kirkpatrick also used the stuff on himself ' My forearm, he reports, "was numb for a week '

Several drug companies specializing in chemotherapy have contacted the team which recently secured a worldwide patent, and the Defense Department has expressed interest in the capsules as a way of numbing wound pain without incapacitating the whole soldier —Douglas Starr

"The things we know best are those we have not learned "
—Luc de Chapiers

"No attitude is less aristocratic than unbelief "
—Charles-Maurice de Talleyrand-Périgord

LAUGHTER WORKSHOPS

Because it affects the respiratory muscular and cardiovascular systems of the human body, the simple act of laughing can serve as a stress reducer in this most stressful of worlds, according to Sabina White, director of health education at the University of California at Santa Barbara

Laughter reduces tension by giving the body a sort of miniworkout, but society inhibits us from using this natural relaxation technique

She bases her conclusion on a series of workshops that began in 1982 They proved to her satisfaction that 'laughter gives the body a sort of miniworkout Like exercising laughing involves virtually every major system of the body Laughter is a cathartic much like grief or anger We don t know exactly why It may have something to do with the release of endorphins in the brain but we all feel better after we laugh

Infants laugh about one hundred eighty times a day But because as a culture we tend to inhibit cathartic behavior adults laugh roughly fifteen times, she claims In the Santa Barbara Laughter Project, as it s known locally participants—largely students at the university—discuss analyze, and often manage to dispel their inhibitions about laughing in circumstances when laughter is appropriate and healthy

The students—who face the stresses of exams, term papers academic competition and the usual problems of money and social relationships—are taught to handle stress by learning to take life less seriously and to laugh at themselves more frequently Zany games are often used in the Laughter Project classrooms to establish a mood of fun and relaxation which helps to break down inhibitions

Says White 'There s no question that laughter has both physiological and psychological benefits Like exercise, it reduces tension to the point where you can actually lose muscular control So you get expressions like I fell out of my chair laughing It s only society that inhibits us Society says, Wipe that smile off your face Why not laugh more and feel better?'—George Nobbe

GORILLA THREAT

Not long ago African mountain gorillas were being killed at a rate of 15 a year by poachers who could sell their skulls as curiosities for as much as $750 each Last year poachers even killed Dian Fossey, the primatologist who had lived among the gorillas and was considered their "patron saint Now comes news that the beleaguered gorillas are in danger of being killed in an even more insidious way by humans who unwittingly transmit deadly diseases

Last year reports Jeffrey Sayer of the International Union for the Conservation of Nature and Natural Resources three gorillas in a Rwanda nature reserve died of a parasitic disease Although the parasite has yet to be firmly identified pathologists suspect that it could be *Necator americanus*, the human-loving bug more familiarly known as hookworm If so says Sayer, the source could be human feces left in the open by reserve guards and poachers—feces that the gorillas are known to eat—or even close contact with tourists,

Mountain gorilla A serious new threat from human beings

whom tip-hungry guides occasionally, and illegally allow to touch the animals

Even if the parasites in question turn out to be of nonhuman origin, man is not yet off the hook "We know there's a risk of humans transmitting their diseases to the gorilla population, ' Sayer says To reduce the risk he recommends 'burying human feces and observing the existing rules against close contact with gorillas '

—Bill Lawren

"Even if the sky falls there are people to hold it up"
—Deng Xiaoping

CONTINUUM

HEALING TEARS

A few years back William Frey of the University of Minnesota showed that human tears can relieve emotional anxiety by actually washing away stress-causing chemicals. Now a team of researchers from the Academy of Medical Sciences in the Soviet Union has shown that crying can heal physically too.

The Soviet team, from the Institute of Research in Experimental Cardiology, induced some light wounds in the skin of lab rats. They then introduced an irritant into the rats' eyes to start them crying. Amazingly, the simple act of crying in itself seemed to greatly increase the speed at which the wounds healed—in some cases the time necessary to form scars was reduced by as much as 12 days. Even more startling, when the rats' tear glands were removed the wounds started to separate, showing that the healing process was actually reversed.

The scientists concluded that the tear glands secrete chemicals into the blood stream that in turn have a healing effect elsewhere in the body. Although they have yet to be isolated and identified, 'evidently,' concluded one report, "these substances have a salutary influence, at least on the condition of the skin."

—Bill Lawren

Tear crystal: Amazingly, the Soviets found that the simple act of crying seemed to increase the speed at which wounds healed.

A NEW TWIST ON TRANSPLANTATION

How can a surgeon operate on a diseased organ if he can't reach the tumor or damaged area? Some surgeons at Emory University's department of surgery, along with a handful of other doctors at several major medical centers, have an answer. Using techniques developed for transplant surgery, they are removing organs (so far, only kidneys) that would have been inoperable otherwise, repairing the body parts, and putting them back into patients' bodies.

According to Emory urologist and surgeon Sam D. Graham, Jr., this approach to overhauling kidneys has been used since the late Seventies. "It is very rare," Graham comments, pointing out that Emory has attempted only two of the operations to date. "There is an added risk in this sort of procedure because you are taking vessels apart and putting them back together again."

But in some cases—a patient with just one kidney, that is filled with a tumor that can't be reached by standard surgery, for example—the risk may be worth it. "There are some definite advantages over just removing the kidney and looking for a donor organ," points out Graham. "The patient isn't on dialysis while you wait for a kidney to become available. And you don't have to worry about rejection if you are transplanting someone's own kidney back into his or her body."

In a recent operation at Emory University Hospital, a surgical team headed by Graham used transplantation-dissection techniques to carefully remove a sixty-two-year-old man's only remaining kidney, which was half filled with a tumor that had grown upward into a vein. "Then we identified the vein that the tumor was growing into, dissected the tumor out of it, and reconstructed the vein," says Graham. Two hours later the kidney was put back into the patient.

Will other organs ever be removed, mended, and then put back into people? Graham foresees using the technique one day on livers. "The liver has well-defined arterial anatomy and other similarities to the kidney. There are technical problems, but they could be surmountable with all the advances in transplantation techniques we're seeing these days."

—Sherry Baker

A new procedure may spare some patients dialysis (above).

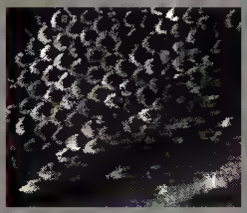
"I could no more define poetry than a terrier can define a rat."

—A. E. Housman

LOST AND FOUND MICROSCOPE

Nearly 20 years ago Czech scientist Mojmir Petráň reported a major advance in optical-microscope technology and then disappeared behind the Iron Curtain. Now news of the remarkable instrument developed by Petráň and his colleague Milan Hadravsky has finally reached the West. Last March the State University of New York at Stony Brook became the first American institution to receive one of the new microscopes.

Ordinary light microscopes give sharp images of the surface of an object only. The lenses can be adjusted to focus on planes up to 180 microns (a thousandth of a millimeter) below the surface of a translucent object, but the clear image coming back from the focal plane is swamped by out-of-focus



View through the lens of the new Czech microscope

images reflected from the surface and intervening planes. The result is a blur. To get a clear microscopic picture of a level below the surface, scientists have to damage the specimen by exposing the plane they want to look at. For example they grind away the outer layers of fossil-tooth enamel to study the inner ones.

The Petráň–Hadravsky microscope overcomes the blurring problem. Scientists can just insert the specimen and peer through the surface at the layers below. Living tissue can be observed in action, the microscope has been used to look at people's eyes, fingers, and teeth.

The Czech researchers eliminated the blurring by placing a slowly rotating copper disc punctured by a special arrangement of holes between the light source and the microscope lens. Light from all the planes in the specimen is reflected, but only light returning from the plane of focus hits the holes in the disc and gets through to form an image.

In 1967 when Petráň published a paper describing the new microscopy technique in the Western journal *Science*, no one noticed. Shortly thereafter the Soviet Union invaded Czechoslovakia, and Petráň's contacts with the West were reduced. He and Hadravský continued their work quietly at the Charles University in Plzeň.

In 1983 Alan Boyde, an English anatomist, met them during a visit to Czechoslovakia and bought one of their microscopes for his London lab. 'The Petráň–Hadravsky microscope would not have come to the attention of the world at this time had it not been for Boyde,' explains Lawrence Martin, a physical anthropologist at Stony Brook and a former colleague of Boyde's. "He worked hard at publicizing the fact that it's doing something totally different from other microscopes.'

—Leah Wallach

SAVE THE FROGS

First it was industrial emissions. Then came aerosol spray cans, to be followed in short order by carbon dioxide, deforestation, and acid rain. Now there's a new script for ecoapocalypse, written by worried experts at the World Wildlife Fund. These pundits are predicting disaster for large areas of the Asian subcontinent if the gourmets of the world don't soon unite to save the frog.

Frogs, according to the Switzerland-based fund, are vital to the stability and balance of the Asian ecosystem because they eat insects—primarily malaria-carrying mosquitoes—by the ton. Take away the frogs, and the only reliable means of insect control are DDT and other dangerous pesticides.

Yet every year, says a fund spokesperson, more than 200 million frogs are captured in the wild and their legs hacked off—while the animals are still alive—to eventually be served up at fancy restaurants around the world. Of the total take, more than 150 million come from three countries: India,

Even[illegible] 200 million frogs are captured and their legs ha[illegible]—while still alive—to be served at fancy restaurants

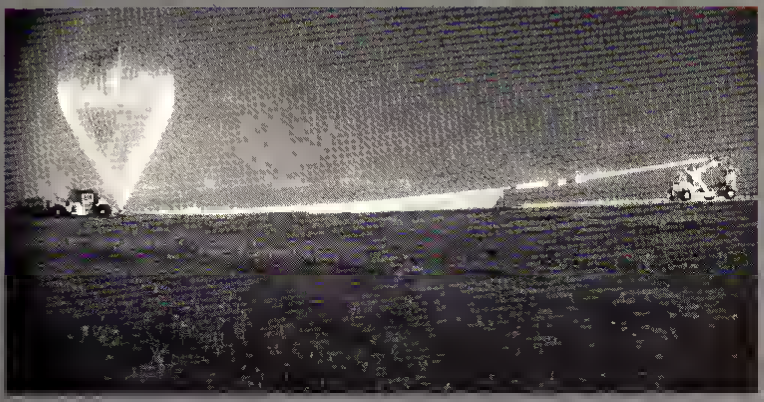
Indonesia, and Bangladesh.

World Wildlife Fund branches in Switzerland and West Germany have already undertaken a massive appeal to restaurants and hotels, asking them to stop serving the traditional delicacy. Eventually the fund hopes to halt the frog trade entirely by generating a worldwide ban. Only then, say the experts, will we be able to avoid "an ecological catastrophe' in Asia.—Bill Lawren

The heart of religion lies in its personal pronouns."

—Martin Luther

CONTINUUM



Superballoon being readied for launch by the National Scientific Balloon Facility At $45 000 per balloon—and only $6 000 for a refill—it's a lot cheaper than a multibillion-dollar shuttle

BALLOONS INSTEAD OF SPACE SHUTTLES?

Astronomy and astrophysics can be very expensive these days That's why a 200-year-old technology—ballooning—is still alive and well Balloons can prove an experiment's concept and design and also do some basic science before longer-duration orbital spaceflights

Fifty or more balloons will be launched this year from the National Scientific Balloon Facility (NSBF) in Palestine, Texas Floating 130 000 feet above the earth at the boundary between air and space, various balloon-borne experiments will look at pulsars in the light of gamma rays and study cosmic rays for clues to the origin of the universe.

One experiment will be a gamma-ray telescope weighing two tons, built by a team from the California Institute of Technology The telescope, explains Caltech physicist Thomas A Prince is akin to a multiple-pinhole camera It will examine pulsars and other astronomical sources of gamma rays Two targets are the pulsars Cygnus X-1 and X-3, which may be black holes

The balloons for such payloads are huge—sometimes reaching volumes 300 times that of the Good year blimp—and cheap It costs NASA, which funds the NSBF $45 000 to buy a balloon and about $6,000 to fill it with helium Compare that with a multibillion-dollar space-shuttle replacement for *Challenger* or the similar cost for the new 400 inch Keck telescope

The Caltech balloon may be launched shortly 'We actually rolled it out last fall but weather kept us from launching,' Prince says 'We'll try again this fall probably in late September or early October The high-altitude winds reverse direction then and for a while it is very calm at high altitudes The balloon will stay in roughly one place for a long time, thirty or forty hours '

—Joel Davis

'Californians invented the concept of life-style This alone warrants their doom '

—Don DeLillo

LASERS UNCLOG ARTERIES

Blood vessels are the body's plumbing, and like ordinary pipes they can get clogged Hundreds of thousands of Americans suffer fatal heart attacks each year because of blocked coronary arteries Now medical researchers hope that lasers and optical fibers can give them an equivalent of the plumber's snake to clean out these blood vessels

The idea of laser angioplasty is to thread a tiny optical fiber through the artery so that it can deliver laser energy, the laser removes the obstruction, and the patient thus avoids a coronary bypass or other major surgery

Best results have been in arteries to the arms and legs where blockages can be painful and may even lead to amputation Nearly blocked arteries can be forced open by inflating a balloon inside but 40 percent recollapse soon afterward An alternative method developed by Trimedyne of Santa Ana, California uses a laser-heated metal tip on an optical fiber inserted through the skin into an artery This burns through blockages In clinical tests at Boston University Hospital the laser technique combined with balloon treatment opened 39 of 42 arteries including many arteries too badly blocked for normal balloon dilation

But there are problems Early clinical tests show it's difficult to blast cholesterol-laden plaque from coronary arteries with laser light that s emerging from the end of a fiber A big problem is finding the blockage and hitting it with laser pulses Misdirected energy or fiber ends can remove arterial walls as well as plaque and too much laser energy can cook tissue And coronary arteries are so convoluted that open-heart surgery probably will be needed just to insert the fiber

Nevertheless, specialists remain excited by laser angioplasty, though they warn it may take years to realize its promise —Jeff Hecht

Science-fiction master Arthur C. Clarke presents his detailed vision of life beyond 2001.

BRAVE NEW TALES OF 2019

This introduction should have been written by Arthur C. Clarke. After all, the following special section was his creation. But a Tamil Tiger bomb intervened, and Clarke, only a block or so away from the blast that reportedly killed several of his neighbors in Colombo, Sri Lanka, found himself tied up in the bloody details of an undeclared civil war. He sends his regrets. More about the war later.

First, let us explain that the two stories you are about to read—"Tech Trek" and "House Arrest"—are exclusive excerpts from *Arthur C. Clarke's July 20, 2019: A Day in the Life of the Twenty-first Century*, an Omni book to be published next month by Macmillan Publishing Company. The idea was surprisingly simple: Get the greatest science-fiction writer and literary futurist of our age (that's Arthur) and give him access to the resources, personnel, and writers of the most successful science magazine of our time (that's *Omni*). Then ask him to use this staff to paint a highly detailed portrait of what life will be like on July 20, 2019—50 years to the day after the *Apollo 11* spacecraft touched down on the lunar surface.

Working under Clarke's direction, *Omni* gathered together its most knowledgeable contributors in 14 fields—medicine, robotics, sports, space exploration, space history, housing, entertainment, transportation, psychiatry, office technology, education, death and dying, weaponry, and sex. Taken together, their chapters present a comprehensive picture of life in 2019.

Our preview of the book features two of those chapters. "Tech Trek," by T. A. Heppenheimer, describes the cars, trains, scramjets, and other vehicles we'll be driving (or riding in) come 2019. "House Arrest," by Erik Larson, is based on sober research into what housing in the twenty-first century will be like—but with a twist. The chapter is told in the form of a bizarre short story centered on an unconventional protagonist.

An ironic twist to Clarke's newest book is the wholly conventional means used to convey the various chapter manuscripts between *Omni*'s New York offices and Clarke's residence in Sri Lanka. Though the technology exists in the West, there are as yet no reliable, simple electronic means of relaying on-disk manuscripts to and from the Third World. So we resorted to an old standby, air courier. Ironic, considering that Clarke's most notable nonfiction piece is a paper entitled "Extraterrestrial Relays," published in the October 1945 issue of *Wireless World*. It was the first proposal for the use of satellites for radio and television communication, and Clarke has called it "the most important idea of my life." Certainly, satellite communication will one day ease the writing of such books, for our Bronze Age method of communicating set us back on more than one occasion.

For one thing there was Sri Lanka's guerrilla war. Sri Lanka, located off the southern coast of India, is home to 15 million people, including 2.8 million Hindu Tamils, who want independence from the majority Buddhist Sinhalese. To achieve this, they've formed the Tamil Tigers, a collection of guerrilla factions that has engaged the Sinhalese army in a disruptive civil war that has already killed more than 1,000 people and brought parts of this once-prosperous nation to a virtual standstill.

It also brought to a standstill our courier service, which reported last fall that all of its vans at the Colombo airport had been "blown up." So much for the chapters on robotics, sports, and education (redelivered, fortunately, by a courier with a larger fleet of trucks).

It was during this period that we received a letter from Clarke with his notes on a chapter devoted to futuristic weaponry. "Before commenting on the chapter on war," he wrote, "I have to declare my interest—or lack of it. The whole subject disgusts me."

As we go to press with this magazine, Clarke is nevertheless coping with warfare in Sri Lanka, the name of which means "the resplendent land." But last October his final thought on the prospect of war in 2019 was this: "In the long run—no, the very short run—we have to become intelligent mammals, not turn ourselves back into armored dinosaurs."—Dick Teresi

PHOTOGRAPH BY WILLIAM COUPON

It knows when you've been sleeping. It knows when you're awake. It knows if you've been bad or good. It knows

HOUSE ARREST

"Charlie. You're not going to believe this. I don't believe this." Hardee Jackson passed a copy of the arrest warrant over to Charlie Beauchamp.

Beauchamp unfolded the document and read it through. Jackson watched as his partner's pale blue eyes went to the bottom, then back to the top, then back down again. Beauchamp's eyes were not nice eyes.

Beauchamp—he pronounced it *Beechum* but Jackson always used the French pronunciation—showed the yellowed teeth at one corner of his mouth.

"Jackson. This had better be a joke."

"No joke, Charlie," he answered. "I just got it from the DA. Schwarz. He wants us to pick up Frank in white collar and go do it now."

PAINTINGS BY EVELYN TAYLOR

"Frank? Has Frank seen this thing yet?"

"No. We're going to tell him now."

"Not we. You. I mean it, Jackson. Some one's been pulling your chain. If you want to make a fool of yourself, you go get Frank. Then you come get me and we'll roll."

A big man came around the corner carrying a straw Stetson and a blue seersucker jacket. "Hey," he said, "Captain told me to stop by."

"Just the man Jackson's looking for," Beauchamp said.

Beauchamp handed the paper to Jackson, who handed it to Frank D'Angelo, the senior computer-fraud investigator from White Collar Crime and Fraud. D'Angelo raised an eyebrow. "So for once they took my advice."

Beauchamp threw a stack of index cards into the air. "Frankie Frankie Frankie. What is this bullshit?"

"No bullshit. It's the only way it could have happened."

"But Frank!"

D'Angelo folded the paper and tucked one end in his pants, the other behind one of the suspender straps. He pulled on his jacket. "Let's go, gents," he said. "I'm dying to see how you guys handle this one." He took a step toward the door. "Oh, hey. I almost forgot. Better get an extra-large squad car." He was still laughing as he rounded the corner.

On the way, D'Angelo ripped a piece of paper into three small pieces, inked a dot on one, then stuck the pieces back in his Stetson. Each picked out a piece to see who would have to read the suspect his rights. Beauchamp picked the marked slip.

At 2:15 PM, July 22, the three detectives pulled up at 1185 Leavenworth, one of the newest homes in northern Baltimore, and arrested a suspect in the murder of Samuel J. Palmerston, found dead in front of his television on July 20. Beauchamp pulled a laminated card from his wallet, stepped back 25 feet, and shouted at the house. "You have the right to remain silent."

It was not the typical *crime passionnel*.

By 1990 computers had grown sentient, and architects began designing the new machines into their houses and cities until the houses and cities became machines in themselves. This had done wonders for household energy costs. It had not done much for Samuel J. Palmerston. Students of crime say the roots of his murder go back to the late Eighties, in particular to a young architect named Bertold Schmeck and a cockroach named Adrian.

There were no sudden oil shortages, no new oil embargoes, OPEC, the Organization of Petroleum Exporting Countries, had crumbled. Rather, the costs of heating and cooling a conventional home had steadily risen until they became too great even for affluent homeowners. Architects had begun experimenting with smaller living spaces, in ground homes, and climate control monitored by microprocessors. Motorola researchers, for example, tested motion sensors that turned lights on and off when people entered or left a room. This quest intrigued young Schmeck.

Schmeck's pioneering achievement was the Lang-Ziegler Chemical Company

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MURDER BY HOUSE: LAW IN 2019

BY MARION LONG

By 2019 will inanimate objects need highly animated lawyers to defend them? If so, juries may have to decide who's responsible for a crime: the designer of the machine, the programmer, or the machine itself. We've asked four of America's best-known lawyers to take a judicial leap in time and tell us how they'd defend the house in this hypothetical case of home-a-cide.

WILLIAM M. KUNSTLER

Arthur's case demands the type of defense that should have been—but was not—used in the trial of Jean Harris for the 1980 fatal shooting of diet doctor Herman Tarnower.

This type of defense is pitched in terms of intense psychological stress or, as New York law puts it, "extreme emotional disturbance" of such intensity that it becomes virtually irresistible. While such a defense normally results in a conviction for manslaughter instead of murder, some juries—either out of sympathy for the defendant, dislike for the victim, or both—will be moved to acquit.

Like Harris, Arthur, after a lengthy and extremely intimate relationship with

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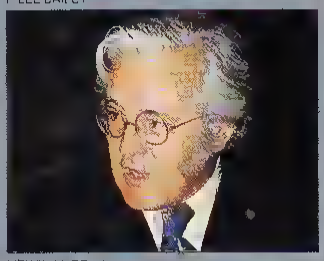
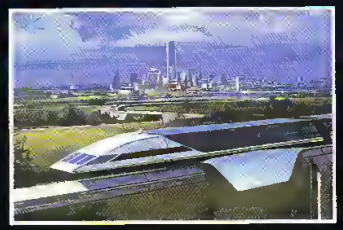
WILLIAM M. KUNSTLER

F. LEE BAILEY



MELVIN M. BELLI

MARVIN M. KELSON



Hundred-mile-per-gallon cars, Mach 3 jetliners, and rocket planes to Earth orbit—travel options for 2019

TECH TREK

PAINTINGS BY ATTILA HEJJA

MEMO FROM THE COSMOS TRAVEL AGENCY TO ROBERT HSUANG HUANG CLIENT

Re Itinerary

Destination Las Vegas Nevada USA

July 20 Singapore to Los Angeles USA
Pan Am Flight 031
Departs Paya Lebar International Airport at 10 30 A M
Arrives Los Angeles Intercontinental Airport 10 40 PM (local time) Flight time 2 hours, 10 minutes
Los Angeles to Las Vegas California Magnetic Railroad (Calmag) Trains run every hour Travel time 55 minutes

July 21 to July 30 Rental car and hotel in Las Vegas
Rental Car A Jialing Aurora (standard size) is reserved at Avis Rent-a-Car at the Calmag station
Hotel and Casino 3510 South Las Vegas Boulevard

July 30 Las Vegas to Los Angeles Intercontinental Airport via Calmag trains We recommend a 7 00 PM departure with arrival at 7 55 PM
Los Angeles to Singapore Pan Am Flight 038
Departs Los Angeles Intercontinental Airport 9 00 PM
Arrives Paya Lebar Internationaf Airport 1 15 PM (Singapore time) Flight time 2 hours 15 minutes
In-flight videos Channel 1—views outside the aircraft Channel 2—*Rambo First Blood Part VI* Channel 3—*Picnic*

Total cost for this itinerary is $23 542 68 all taxes included

We hope you have a pleasant trip

What will it be like to travel around in 2019? What can we expect of the aircraft, the spacecraft, the cars of 2019? Overall, the vehicles of that future time will make today's best designs appear nearly as obsolete as the cars and planes from the Eisenhower years. The Pontiac Fiero and the Corvette Stingray, for instance, will still be cherished in the same way that the early Ford Thunderbirds evoke nostalgia today. As for modern, up-to-date vehicles, we can expect sweeping changes.

"I gave a speech in 1965 about what the car would be like in twenty years," said Chrysler's Lee Iacocca recently. "I said the car will have four wheels. It will be a thousand pounds lighter. It will carry a sophisticated version of the internal-combustion engine, and it won't have a spare tire. I missed on the last one, but I was right about the rest. I said there wouldn't be any electric cars, the diesel wouldn't be important, and we wouldn't have the problem of the turbine solved. I underestimated the importance of microprocessors, as we all did. Otherwise the prediction was pretty accurate. And you know what? I'd give that same speech today."

Iacocca's trends—lighter weight, increasingly sophisticated gasoline engines, and increasingly pervasive electronics—give us a pretty good idea of what to expect in the showrooms as dealers offer bargains to clear out their stock of '19 models. Those bargains would give even today's buyers a severe case of sticker shock, but then, today's $12,000 prices would have represented three years of average income to a 1953 shopper. But for 2019's low, low price of $70,000, with easy credit terms, a new car will offer a lot.

Sleek, aerodynamic styling may well make it as streamlined as a fighter plane. A low, sloping hood will flow smoothly into the windshield, and the car's glass panels will be flush with the body. There will be no front grille; side-entry cooling will provide the needed airflow. Spoilers on the rear trunk, air dams under the front and rear bumpers, flush-mounted headlights, and wheel-well covers will be standard design features. The overall shape will be nearly as smooth and self-contained as an egg.

Sheet-metal bodies will go the way of wood paneling. Instead, the bodies will be built of plastics and composites, reinforced with fibers of glass or graphite. These have outstanding strength and low weight, up to 60 percent less than steel. Gone will be spot welds, primer, and other old-fashioned, metallic features. Body panels and parts will be prepared at the factory in completely painted and finished form, then glued together. The new bodies will never corrode. Fenders made of certain plastics will absorb a dent and minutes later assume their original shapes.

> *"Sleek aerodynamic styling may well make the car as streamlined as a fighter plane. The overall shape will be nearly as smooth and self-contained as an egg."*

Both the engine and its transmission will operate under microprocessor control. The transmission will be continuously variable, in effect making available an infinite number of gears. As the car proceeds through traffic or onto the highway, its microcomputer continually adjusts the engine speed, tuning, and transmission to maximize efficiency. These adjustments will also control pollution and avoid engine roughness or knocking. What is more, the car will never need a tune-up.

The cars of 2019 will have dozens of electronic options. Dials on and voices from the instrument panel will warn of any trouble in the engine, drive train, or tires, and onboard navigation will make it impossible to get lost. The car will be able to locate its position using satellite navigation systems and will show this position on a color video map display. This TV screen—located on the passenger side—will also display an atlas of maps stored on a videodisc. The car's artificial intelligence will then direct the driver to his destination, much as today's American Automobile Association offers trip-planning services.

Other electronic systems will add to the car's safety and convenience. In case of trouble, its microcomputer will tell the mechanic just what's wrong. When major problems, like a breakdown out in the desert, occur, the car will transmit a help signal to a "guardian" satellite.

A radar system will warn of cars in the blind spots; there may even be automatic collision avoidance, enabling the driver to automatically steer out of impending disasters. And in those rare instances when a crash can't be avoided, detectors will sense the proper time to inflate air bags.

Such autos will be fast and cheap—mileage may top 100 miles per gallon. Even so, they could face competition from maglevs, the magnetically levitated railroads now in operation in Japan and Germany. The German system is in regular service near Bremen, carrying nearly 200 passengers at more than 200 miles per hour. The Japanese maglev, still under development, has reached higher speeds. In 1979 it set a record of 321 miles per hour on a test track.

The German design, Transrapid-06, is a version of the Disneyland monorail. Its rail has a T-shaped cross section, five feet wide, and is raised on pylons 16 to 20 feet above the ground. The train rides that rail. Its sides extend downward and wrap around the T. Electromagnets in these side extensions draw the train's weight upward as they are attracted to other magnets built into the underside of the T. The electromagnets have control systems to vary their force. So they maintain a steady separation of an inch or so below the track. The track, in turn, sets up a magnetic wave that propels the train forward like a surfboard on the ocean.

Such a monorail will soon be built in the United States. The Department of Transportation has approved the Transrapid for a proposed 8,800-passenger-a-day link from Los Angeles to Las Vegas. By the early Nineties it could be in service. Its energy efficiency would be greater than that of an airplane; thus the Transrapid's round-trip cost could be as little as $50, half the current airfare. Trip time will be an hour from downtown L.A. to The Strip. It will be a smooth, almost noiseless ride.

This German approach, however, stands to be challenged by the faster Japanese design. Instead of attracting a train to the track, the magnets repel. The track resembles a U-shaped trough; the train nestles cozily within its curve, riding several inches above the track. It uses high-tech devices known as superconducting magnets.

Superconducting magnets use liquid

helium to freeze coils of niobium–titanium alloy to temperatures close to absolute zero – 460°F. Amid such frigid conditions the metal loses its electrical resistance. A flow of current will then circulate without loss, producing a magnetic field that can persist indefinitely. A maglev train employing such magnets can cruise for long distances without needing any power to keep itself levitated.

The early decades of the next century will certainly see maglevs take off. They will be built down the center medians of interstate highways along such heavily traveled routes as San Diego–Los Angeles–San Francisco and Boston–New York–Washington. They will also link airports to city centers. passengers will sit in comfort, 20 feet off the ground, and smile as they zip past the fuming motorists stuck in five o'clock traffic. Indeed, they will permit more of such immense, sprawling airports as Dallas–Fort Worth. For instance, a proposed mega-jetport called Los Angeles Intercontinental Airport, 100 miles from the city in remote desert country, will certainly come into its own.

Such maglevs will run at no more than half the speed of an airliner, but with their city-center convenience they will permit similar total trip times for distances up to several hundred miles. Inevitably their low cost will spur thoughts of a transcontinental system.

Other technologies will change the way we travel at sea. The screw propeller has ruled the sea for more than a century, but it stands to be challenged by magnetohydrodynamics, or MHD. This makes possible fast undersea propulsion by water jets. An MHD jet would have a rectangular channel resembling a long hallway. At its top and bottom there are north and south poles of powerful magnets. To the sides are negative and positive electrodes, with a powerful electric current passing across the channel.

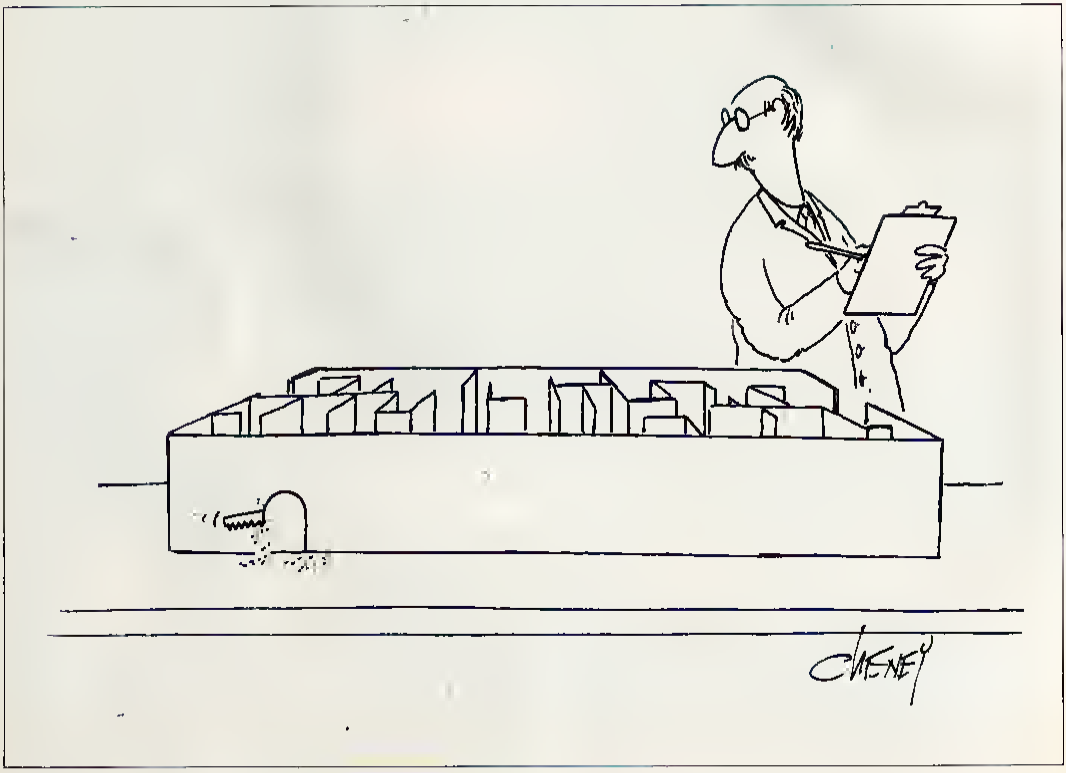
Seawater fills the channel. It conducts electricity and can be made much more conductive by seeding it with a metal such as cesium. Under the action of the electric current and the magnetic fields, the water then flows rapidly, blowing out the back in a vigorous jet. By reversing the electric current the jet will blow to the front, allowing a sub to stop very quickly. This arrangement offers high speed and maneuverability along with exceptional quietness, making the sub less detectable.

For added speed tomorrow's subs will rely on special techniques to reduce their drag. The Office of Naval Research is sponsoring studies of how subs could be coated with a smooth, rubbery skin. Naval experts at Pennsylvania State University have reported good results from injecting micron-size air bubbles into the boundary layer, the thin layer of water that clings to the surface of a sub and slows it down. These bubbles have reduced drag by more than 80 percent.

In San Diego the Naval Underwater Systems Center is studying how drag can be reduced even further by injecting gooey polymers or soaplike chemicals into the boundary layer. The water then flows past the hull with less turbulence and less drag.

In pursuing these advances submarine experts will be drawing on many of the methods that will also be used for aircraft research. For instance, today it is rapidly becoming possible to design new jetliners entirely by computer, with little or no need for wind tunnels. The resulting designs can be put through their paces in silicon skies, then manufactured and sent into service. In a few years it will also be possible to do the same for new aircraft engines, which are more difficult to design and which demand more powerful computers. And as with cars, composite materials—carbon fibers embedded in epoxy plastic, for instance—will take over as the primary construction materials, replacing aluminum. The plastic plane will become common.

Such developments are currently opening the way to an immense wave of innovation in aircraft design, featuring new engines, new and lightweight shapes with low drag, and path-breaking craft that will cruise in the upper atmosphere, then leap easily into space.



Let us visit an airport of 2019 then and take a look around The planes operate somewhat as if they were buses They do not spend hours sitting and waiting Rather they taxi up to the gates discharge a flow of passengers and baggage, take on more people and are off on another trip all within 20 minutes or less The airlines appreciate this, these planes make money only when they are in the air Another nice feature is their fuel efficiency more than double that of today's best jets All this will mean lower ticket prices and more low-fare specials

With lighter weight and greater fuel efficiency the wide-bodies will fly farther, nonstop flights from the East Coast to destinations across the Pacific will be more common Since these long hauls will be quite wearying to the passengers these transpacific jumbos will face stiff competition from supersonic jetliners twenty-first century successors to the Concorde The Concorde is obsolete even today It is built of aluminum which cannot stand high temperatures the heating of high-speed flight thus limits it to twice the speed of sound And its Olympus jet engines are notorious fuel hogs

Tomorrow's Pacific Supersonic Transport (PST) will be nearly twice as heavy as the Concorde—375 versus 200 tons—but will carry 600 passengers five times as many It will cruise at more than three times the speed of sound and may well outrace the Blackbird the reconnaissance aircraft that holds the current speed record—2,193 miles per hour This high speed will allow the PST to do three times the work of a similar-sized jumbo jet and burn only twice as much fuel Its fuel efficiency will be three times that of the Concorde It will fly 6,000 miles at a stretch taking four hours for the Tokyo–San Francisco run

The key to this is something called supersonic cruise, which demands a host of advanced technologies methods for producing smooth airflow past aircraft shapes and avoiding drag-producing turbulence, lightweight temperature-resistant composites smoother engine airflow, and advanced cooling methods NASA has already studied some of these techniques and materials in its Supersonic Cruise Program Others are being demonstrated aboard the supersonic X-29 research aircraft The Air Force intends to have a supersonic-cruise feature in its next interceptor the Advanced Tactical Fighter

A Pacific Supersonic Transport will be a long sleek affair its fuselage resembling a thick arrow pierced with windows Small fins and tail surfaces will add to the arrowlike effect (Some versions will have two such fuselages side by side passengers can wave to one another across the broad central wing) Its wing in turn will have a sharply swept-back delta shape with winglets—small finlike extensions—at its tips to cut drag Mounted beneath the wing will be the thick, black cylinders of the engines two for the standard version three for the double-fuselage model

Yet such aircraft still may fall short of being the most advanced in service Just as the Concorde prospers in an era of cut-rate flights to Europe, so there will be travelers for whom even Mach 3, three times the speed of sound, is too slow Travelers enduring ten-hour flights from Rio to Singapore will look up with envy toward the orbiting space stations, which cover the same distance in 40 minutes The real successor to the Concorde as a costly but speedy aircraft that is profitable over specialized routes will be the hypersonic transport It will fly at more than half the speed of a satellite and will reach any destination within two hours

New engines, the key to such craft, are now being vigorously studied These engines are variants of the ramjet, the simplest type of jet engine A ramjet is little more than a carefully shaped tube or duct with fuel injectors At high speed it relies on the sheer force of its forward motion to ram or compress the oncoming air into its combustion chamber

When air flows within a ramjet at Mach 6 it slows down and heats up This aerodynamic heating is common in all high-speed flight and is too great for most engine materials The path to higher speeds then

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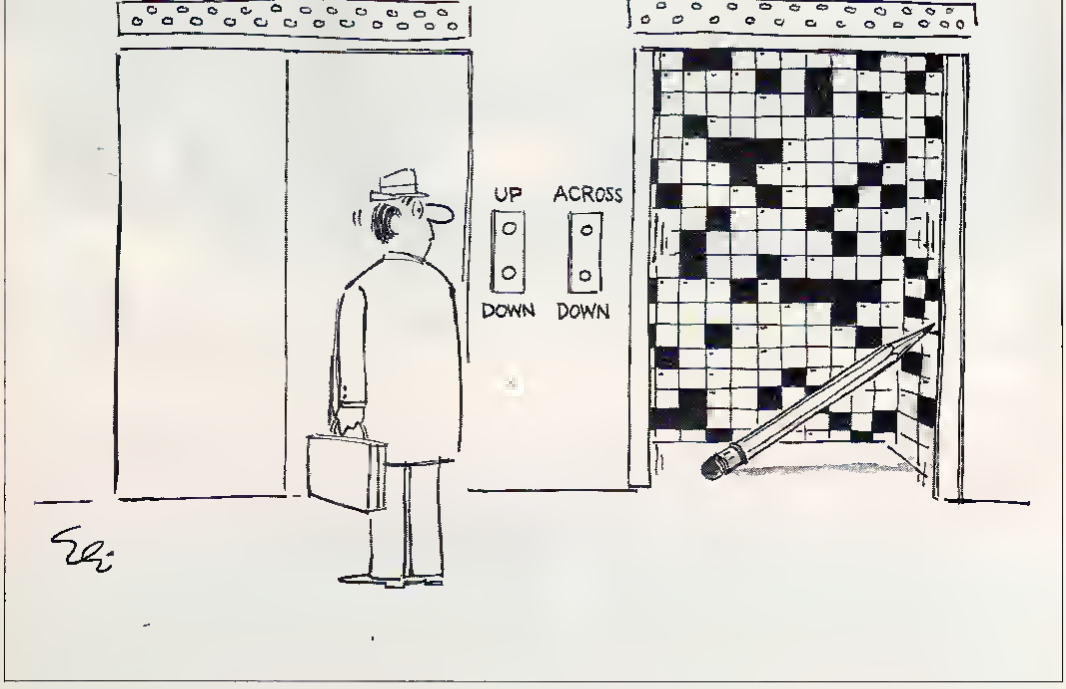
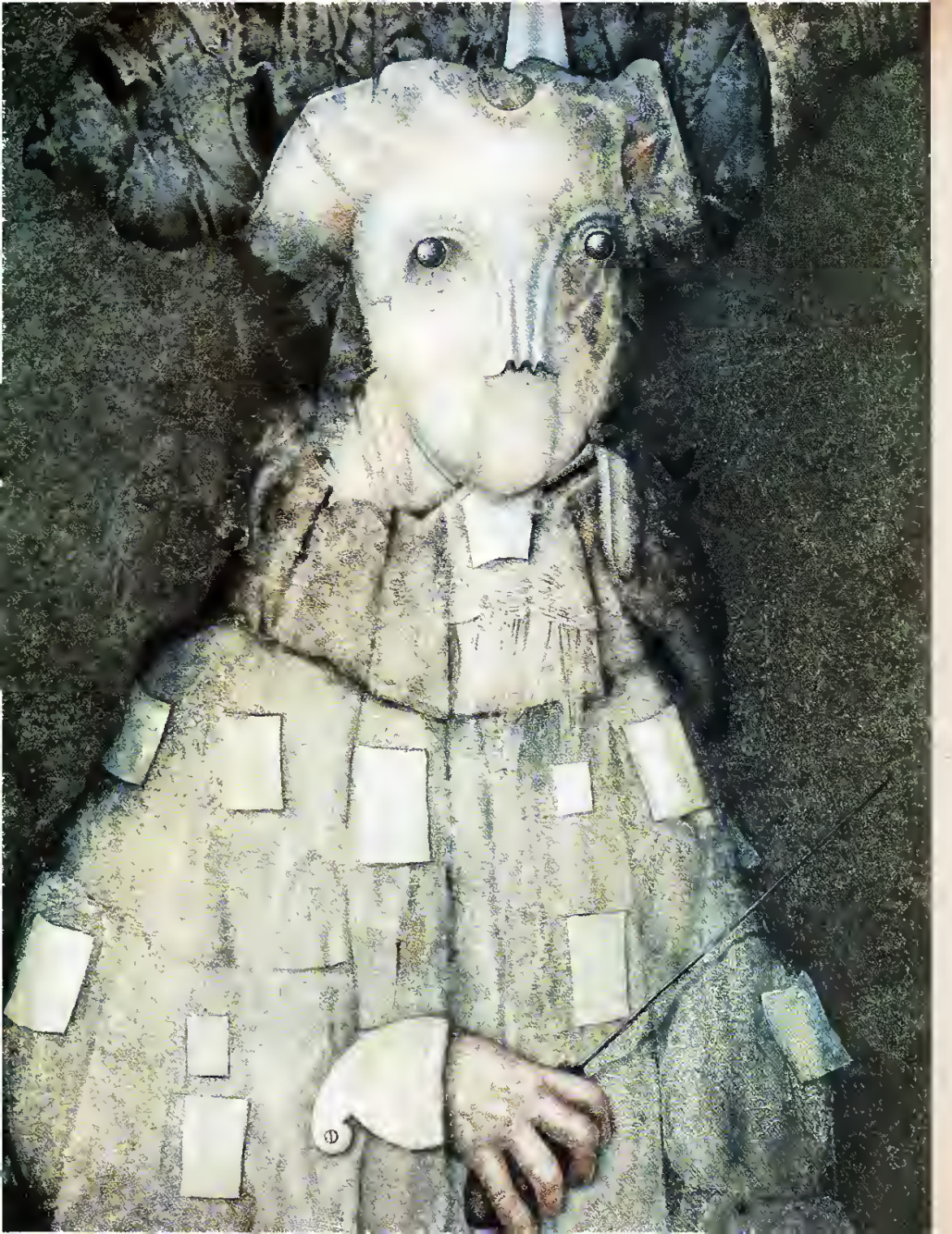




FICTION

Can music born of the human experience touch the souls of alien beings?

LISTENING TO BRAHMS

BY SUZY McKEE CHARNAS

Entry 1 They had already woken up Chandler and Ross They did me third I was supposed to be up first so I could check the data on the rest of our crew during their cold sleep but how would a bunch of aliens know that?

Our ship is full of creatures with peculiar eyes and wrinkled skin covered with tiny scales a lot like lizards walking around on their hind legs Their skins are grayish or greenish or even bluish sometimes They have naked-looking faces—no hair—with features that seem polished smooth The first ones I met had wigs on and they wore evening clothes and watered-silk sashes with medals I was too numb brained to laugh and now I don't feel like it They all switched to jumpsuits once the formalities were over I keep waiting for them to unzip their jumpsuits and then their lizard suits and climb out regular human beings I keep waiting for the joke to be over They speak English some with accents some not They have breathy voices and talk very softly to us That may be because of what they have to say They say Earth burned itself up, which is why we never got our wake-up signal and were still in the freezer when they found us Chandler believes them Ross doesn't I won't know what the others think until they're untrozen

I sit looking through the viewplate at Earth such as it is I know what the lizards say is true but I don't think I really believe it I think mostly that I'm dead or having a terrible dream

Entry 2 Steinbrunner killed himself (despite their best efforts to prevent anything like that the lizards say) Sue Anne Beamish fifth to be thawed won't talk to anybody She grits her teeth all the time I can hear them grinding whenever she's around It's very annoying

The lead lizard's name is Captain Mid-

PAINTINGS BY ARMODIO

night. He says he knows it's not the most appropriate name for a spaceflight commander, but he likes the sound of it.

It seems that on their home planet the lizards have been fielding our various Earth transmissions, both radio and TV, and they borrow freely from what they've found there. They are given native names, but if they feel like it later they take Earth-type names instead. Those on Captain Midnight's ship all have Earth-type names. Luckily the names are pretty memorable because I can't tell one alien from another except by the name badges they wear on their jumpsuits. I look at them sometimes and I wonder if I'm crazy. Can't afford to be, not if I've got to deal on a daily basis with things that look as if they walked out of a Walt Disney cartoon feature.

They revive us one by one and try to make sure nobody else cuts their wrists like Steinbrunner. He cut the long way that can't be fixed.

I look out the viewplate at what's left of the earth and let the talk slide over me. We can't raise anything from down there. I can't raise anything inside me either. I can only look and look and let the talk slide over me. Could I be dead after all? I feel dead.

Entry 3. Captain Midnight says now that we're all up he would be honored beyond expression if we would consent to come back to Kondra with him and his crew in their ship. *Kondra* is their name for their world. Chu says she's worked out where and what it is in our terms, and she keeps trying to show me on the star charts. I don't look. I don't care. I came up here to do studies on cryogenic nutrition in space, not to look at star charts.

It doesn't matter what I came up here to do. Earth is a moon with a moon now. *Nutrition* doesn't mean anything, not in connection with anything human. There's nothing to nourish. There's just this airless rock, like all the other airless rocks rolling around in space.

I took the data the machines recorded about us while we slept and I junked it. Chu says I did a lot of damage to some of our equipment in the process. I didn't set out to do that, but it felt good, or something like good, to go on from wiping out information to smashing metal. I've assured everybody that I won't break out like that again. It doesn't accomplish anything, and I felt foolish afterward. I'm not sure they believe me. I'm not sure I believe my own promise.

Morris and Myers say they won't go with the Kondrai. They say they want to stay here in our vessel just in case something happens down there or in case some other space mission survived and shows up looking for whatever's left, which is probably only us.

Captain Midnight says they can rig a beacon system on our craft to attract anybody who does come around and let them know where we've gone. I can tell the lizards are not going to let Morris and Myers stay here and die.

They say the Kondrai do, that they didn't actually come here for us. After several generations of receiving and enjoying Earth's transmissions, Kondran authorities decided to borrow a ship from a neighboring world and send Earth an embassy from Kondra, a mission of goodwill.

First contact at last, and there's nobody here but the seven of us. Tough on the Kondrai. They expected to find a whole worldful of us, glued to our screens and speakers. Tough shit all around.

I have dreams so terrible there are no words.

Entry 4. There's nothing for us to do on the Kondran ship, which is soft and leathery inside its alloy shell. I have long talks with Walter Drake, who is head of mission. Walter Drake is female. I think. Walter Duck.

If I can make a joke, does that mean I'm crazy?

It took me a while to figure out what was wrong with the name. Then I said, "Look, it's Sir Walter *Raleigh* or Sir *Francis* Drake."

She said, "But we don't always just copy

> *"I look out the viewplate at what's left of the earth. I let the talk slide over me. We can't raise anything from down there. I can't raise anything inside me either."*

I have chosen to commemorate two great voyagers."

I said, "And they were both males."

She said, "That's why I dropped the *Sir*."

Afterward I can't believe these conversations. I resent the end of the world, my world coming on as a bad joke with Edgar Rice Burroughs aliens.

Myers and Morris play chess with each other all day and won't talk to anybody. Most of us don't like to talk to each other right now. We can't look in each other's eyes for some reason. There's an excuse in the case of not looking the lizards in the eyes. They have this nictitating membrane. It's unsettling to look at that.

All the lizards speak English and at least one other Earth language. Walter Drake says there are several native languages on Kondra, but they aren't spoken in the population centers anymore. Kondran culture, in its several major branches, is very old. It was once greater and more complex than our own, she says, but then it got simple again and the population began to drop. "The whole species was, in effect, beginning to close down. When our signals were first picked up, something else began to happen: a growing trend toward population increase and a young generation fascinated by Earth culture."

The older Kondrai, who had gone back to living like their ancestors in the desert, didn't object. They said fine, let the youngsters do as they choose as long as they let the oldsters do likewise.

I had to walk away when Walter Drake told me about this. It started me thinking about my own people I left back on Earth, all dead now. I won't put their names down. I was crying. Now I've stopped, and I don't want to start again. It makes my eyes hurt.

Walter Drake brought me some tapes of music that they've recorded from our broadcasts. They collect our signals, every thing they can, through something they call the Retrieval Project. They reconstruct the broadcasts and record them and store the recordings in a huge library for study. Our classical music has a great following there.

I've been listening to some Bach partitas. My mother played the piano. She sometimes played Bach.

Entry 5. Sibelius, Symphony No. 2 in D, Op. 43; Tchaikovsky, Variations on a Rococo Theme, Op. 33; Rachmaninoff, Symphonic Dances, Op. 45; Mozart, Clarinet Quintet in A major, K581; Sibelius, Symphony No. 2 in D, Op. 43; Sibelius, Symphony No. 2 in D, Op. 43.

Entry 6. Chandler is alive. Ross is alive. Beamish is alive; Chu is alive. Morris is alive. Myers is alive, and I am alive. But that doesn't count. I mean, I can't count it. Up. To mean anything. *Why* are we alive?

Entry 7. Myers swallowed a chess piece. The lizards operated on him somehow and saved his life.

Entry 8. Woke up from a dream wondering if maybe we did die in our ship and my "waking life" in the Kondran ship is really just some kind of after-death hallucination. Suppose I died, suppose we all actually died at the same moment. Earth died? It wouldn't make any difference. Earth's people are all dead and someplace else or nowhere, but we are *here*. We are separate.

They're in contact with their home planet all the time. Chu is fascinated by their communications technology, which is wild, she says. Skips over time or folds up space—I don't know. I'm just a nutrition expert. Apparently on Kondra now they are making up their own human-style names instead of lifting them ready-made. (Walter Drake was a pioneer in this, I might point out.) Captain Midnight has changed his name. He is henceforth to be known as Vernon Zeno Ellerman.

Bruckner and Mahler symphonies, over and over, fill a lot of time. Walter Drake says she is going to get me some fresh music, though I haven't asked for any.

Entry 9. Beamish came and had a talk with me. She looked fierce.

"Listen, Flynn," she said, "we're not going to give up."

"Give up what?" I said.

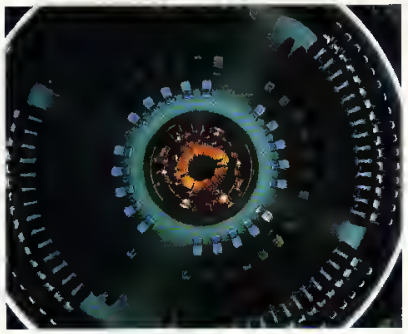
"Don't be so obtuse," she said between her teeth. "The human race isn't ended as

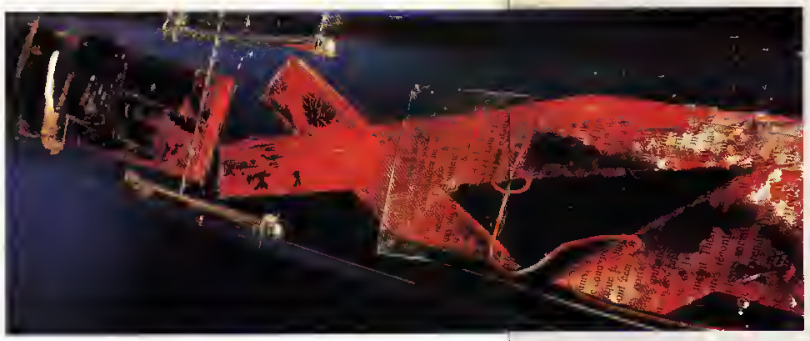
CONTINUED ON PAGE 102

CYBERCITY

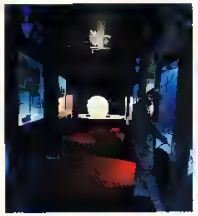
LIKE A GIANT, FRIENDLY AUTOMATON FRANCE'S NEW MUSEUM INTERACTS WITH VISITORS AND OPENS THEIR EYES TO THE WORLDS AROUND THEM

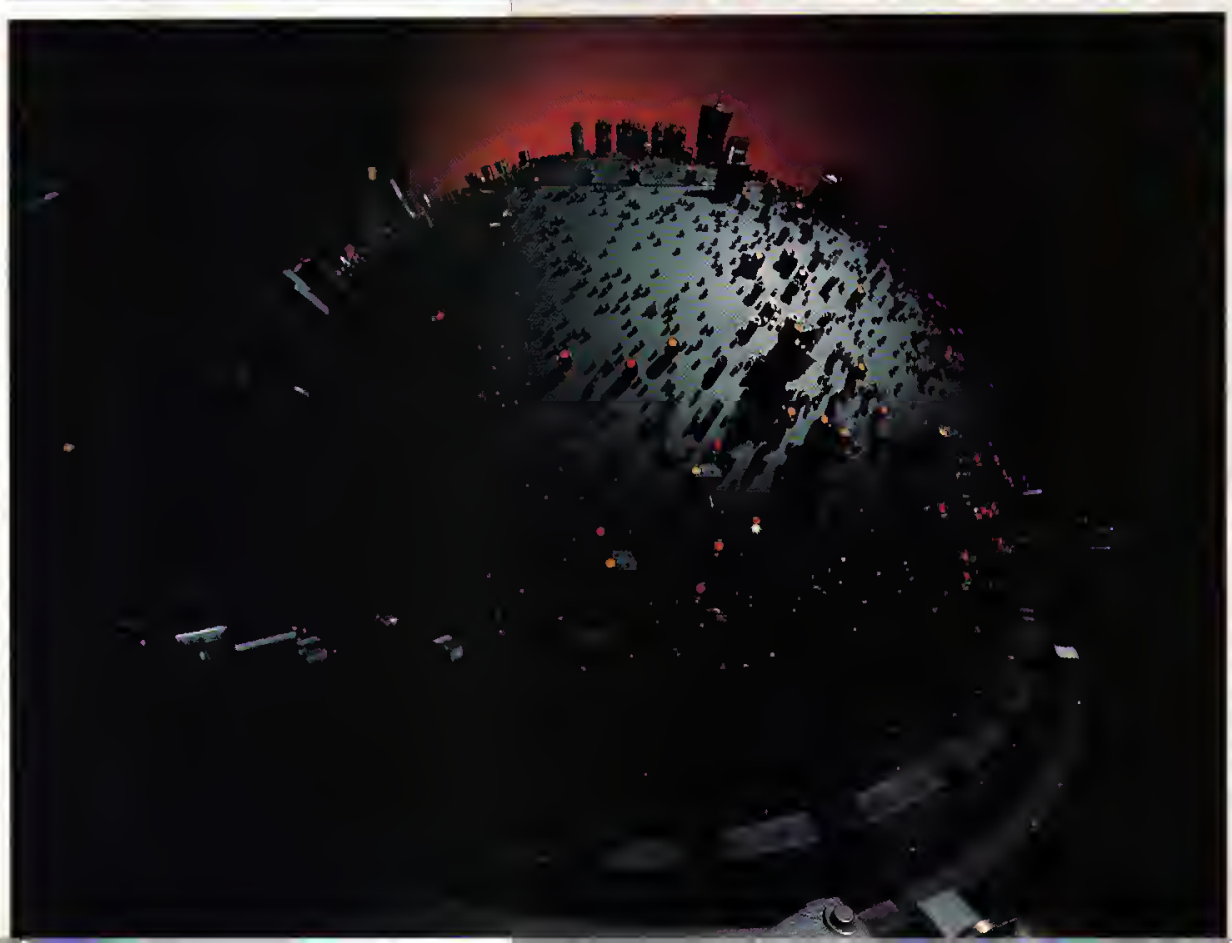
PHOTOGRAPHS BY BRIAN WOLFF

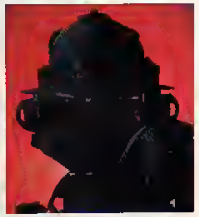




AT THIS PLAYFUL MUSEUM YOU'LL FIND NONE OF THE STANDARD "YOUR FRIEND THE ELECTRON" EXHIBITS, MUSTY DISPLAYS OF DINOSAUR BONES, OR STONE ARROWHEADS.







As soon as you notice its features—like the gleaming, smooth-skinned geodesic dome resembling a giant Claes Oldenburg ball bearing (large photo, previous two pages; and top inset previous page), and the mammoth abstract sculpture of a DNA molecule (top center, this page)—you know you are not in a typical science museum.

At the Cite des Sciences et de l'Industrie, France's new national science museum in Paris, you'll find none of the standard 'Your Friend the Electron' exhibits, musty displays of dinosaur bones, or arrowhead collections. Instead its airy, sunlit interior (bottom inset, previous page) tantalizes its visitors with displays like an interactive model of our solar system (above right) and talking robots (opposite page, far right). To visit the center is to meet a colony of teaching machines.

Erected on the 135-acre site of what was once a cattle market—situated on the northeastern border of Paris, the museum is part of a bold experiment in urban planning. It sits in a complex known as La Villette ('the small town'), which contains a 75-acre park, a performance and music-study center, and behind the silvery orb that is the symbol of La Villette, the museum.

The six-level complex invites its visitors to explore four general theme areas. In 'From Earth to the Universe' visitors can watch a miniature solar system form by playing with a model of a rotational system. In 'The Adventure of Life' environmental themes are the center of attention. There are displays like the Green Bridge, a covered catwalk that is a microenvironment where soilless plants grow suspended in humid tropical air.

'Matter and the Work of Man' is a cybernetic zoo where the electronic fauna include the Good Robot, an interactive 21-foot-high, Plexiglas sphere that is able to respond to noise with its own sound and light. And in 'Language and Communication' one can try out ingenious displays like the carbon dioxide sound bubble (opposite page, lower left), a glass globe filled with the gas. One person whispers into the globe, and the whisper is magnified on the other side by the gas.

For entertainment and information the complex has one of the most sophisticated planetariums (opposite page, top left) in the world. Using a projector (large photo, left) originally designed to train astronauts, it can re-create with breathtaking realism a sky studded with up to 10,000 stars. And for another experiment in synthetic realism there's the theater inside the Geode, the geodesic globe. It houses a hemispheric screen where 70mm film and six-track stereo deliver stunning movies like *The Dream Is Alive* (top right). The Geode also serves as the symbol of this technological small town and a complement to another local totem of technology, the Eiffel Tower.—Douglas Colligan

Space stations, Mars missions—all part of the Soviets' master plan

LIFE IN ORBIT

BY ANDREW CHAIKIN

Traveling from the center of Moscow along a broad thoroughfare called the Leninsky Prospect, you will eventually catch sight of a gleaming 17-story pillar. It stands in dramatic contrast to the gray, cobblestoned vastness of Red Square and the multicolored domes of nearby St. Basil's Cathedral. At the top of the pillar is an Art Deco statue of Yuri Gagarin, his muscle-bound, stainless-steel arms held out from his sides, his gaze forever directed at a distant horizon.

Twenty-five years ago Gagarin earned his place in history by making a single orbit of the earth in a primitive, tiny spacecraft called *Vostok I*. This year, as happens on April 12 of every year, the Soviets celebrated his flight. The festivities were not as lavish as in times past, but they were more significant. Some 220 miles over the top of the memorial two fellow cosmonauts appeared on television to note the anniversary. They, too, had become part of history when they occupied a 20-ton space station called *Mir* (see the large spacecraft depicted at left), meaning *peace* in Russian. *Mir* is another Soviet first: the first permanently manned outpost in space.

Never have the fortunes of the Soviet and American space programs been so disparate. With NASA's plans on hold and the construction of the U.S. space station at least eight years away, American space planners view

PAINTING BY ANDREI SOKOLOV

the Soviets' vigorous space activities with understandable envy and frustration.

"Right now the U.S. space program is in a state of paralysis," says Eugene Levy, head of the University of Arizona's Lunar and Planetary Lab.

By contrast the Soviets are on the verge of an extraordinary era of space exploration. In the past decade teams of Soviet cosmonauts have been pushing back the space endurance barrier, spending months at a time in Earth orbit. Most of that time was spent inside the Salyut space stations, the first of which was launched in 1971. One has only to look inside the cramped, cluttered interior of a Salyut to understand that these space marathons were grueling endurance tests. Spending months at a time in a living space barely the size of a small house trailer is an awesome accomplishment. The biggest stresses were psychological. Privacy was nonexistent, cleanliness was a chore, and the greatest luxury—visitors—a rarity. Despite such hardships a two-man crew lived nearly eight consecutive months—238 days—aboard *Salyut 7* in 1984.

Mir is not as sophisticated as the modular space station now on NASA's drawing boards. It's basically a reworked, slightly roomier version of Salyut. But as one American observer puts it, "It's already up there and working. It's the hare and the tortoise all over again."

Mir was designed with the lessons of Salyut very much in mind. It has none of the bulky scientific equipment that crowded the old stations, and the tangle of wires and pipes that was Salyut's version of interior decorating has been hidden behind yellow and green pastel panels. The station boasts a separate dining room with a mess table and food warmers. And because the marathon crews said watching the earth roll by was one of the greatest weapons against boredom, there are picture windows for panoramic sightseeing. Even privacy is no longer a problem. Each crew member has a stateroom, complete with window, bunk, table and chair.

But *Mir* offers more than just the comforts of home. It's the core of an orbiting scientific and engineering laboratory. One Soviet space scientist has gone so far as to describe it as a "flying Disneyland." The station has a total of six docking ports. Four at its nose are set to receive additional modules laden with scientific equipment. The first module, which will ferry a battery of X-ray telescopes for astronomical studies, is due to be sent up late this year. It will be followed by other modules for meteorology, experiments in space manufacturing, biological studies, and pharmaceutical production.

The Soviets will continue their long-standing practice of inviting other countries to send guest astronauts for visits. *Mir* will host a Syrian cosmonaut sometime next year, and during the joint Soviet–French mission planned for 1988, Salyut veteran Jean-Loup Chretien will most likely take a spacewalk. That same mission will also include experiments designed to help combat the physiological effects of prolonged weightlessness.

Last spring the Soviets tested the docking facilities of the new space station by flying from *Mir* to the older *Salyut 7* space station. While in *Salyut 7* they took several spacewalks to test the feasibility of constructing objects in space.

While NASA has always thought of its permanent space station as a complement to the space shuttle, the Soviets don't appear to share this philosophy. They rely on the venerable but upgraded Soyuz transports that made their debut in 1968. Though they are more than willing to publicize *Mir*, the Soviets conduct space-shuttle work in deep secrecy. Some scientists sense that the Russians may be in no hurry to get it launched. As one French scientist who has collaborated with the Soviets on Salyut missions observed: "They don't feel and have not felt all along that it's safe. Soyuz has escape points all along its path; a shuttle would not." Certainly the *Challenger* disaster, he added, has not eased their apprehension.

As with their manned program, the Soviets' unmanned efforts have been an exercise in persistence. Their space probes have traveled to some of the most difficult-to-explore regions in the solar system, such as the hellish surface of Venus.

Last spring, just a few weeks before the anniversary of the Gagarin flight, I, along with a handful of other science writers, had the rare opportunity to witness the latest coup in unmanned Soviet space exploration: a close brush with Halley's Comet by the twin Soviet probes *Vega 1* and *2*. We had been invited to the Institute for Space Science (known as IKI), just outside Moscow. Watching Soviet scientists in action and talking to some of the international corps of participants, I learned about the steady progress the Soviets will be making as they settle into Earth orbit and pursue still another dream: visiting Mars.

Housed in a drab, six-story cement building on the outskirts of the capital city, the institute, I was told, usually has a relaxed, university ambience. Most days American rock music echoes faintly in the long corridors. But this week was an unusually frenetic one. During the days surrounding the flyby it resembled NASA's Jet Propulsion Lab during the historic flyby of Uranus, as more than 100 scientists from a dozen nations gathered in IKI's huge conference room to participate in humankind's first closeup viewing of Halley's Comet.

The institute's conference room was packed with the American press, scientists and visiting dignitaries. In a small adjacent television studio Carl Sagan prepared to go on ABC's *Nightline* when the craft closed to within 5,500 miles of the comet. "Space technology is intrinsically a risky business," noted cometary astrono-

"How do you know you don't like a zookeeper until you've tasted one?"

mer John Brandt of Goddard Space Flight Center. When you kiss something goodbye for years, the chance of something going down the tubes is very high.

No doubt he and Soviet scientists were remembering a string of disappointments in the early Seventies, when five Soviet Mars probes were disabled by equipment failures. The Vega spacecraft would have to brave a storm of dust grains whizzing by at about 42 miles per second as they passed through Halley's dusty atmosphere. There was a very good chance that at the moment of truth—the close encounter with the nucleus—the television monitors would be blank.

At the critical moment, however, the screens in the darkened hall were anything but blank: they displayed the first views of the dusty ice ball at Halley's heart. From a scientific and a public-relations standpoint, the mission was a triumph.

The Americans present were surprised at how openly the team members talked about the difficulties of getting space missions funded and about the malfunctions suffered by the two craft after their sandblasting in Halley's atmosphere. Journalists were allowed to sit in on science briefings for the teams, something virtually unheard of at the Jet Propulsion Lab.

Both the style and substance of the Vega encounter were largely shaped by the institute's director, Roald Sagdeev, a diminutive physicist with a dry wit and a keen sense of science politics. In 1981, just four years before the scheduled launch of the *Venera 1* and *2* probes to Venus, Sagdeev took the bold step of adding a Halley's flyby to the mission. Realizing that designing and developing the extra instruments for Halley's was too much for IKI to handle alone, Sagdeev enlisted scientists and engineers from Eastern Europe, West Germany and France to join the Vega teams.

It wasn't long before word of the mission reached American planetary scientists, many of whom had just waged an unsuccessful battle for a Halley's mission of their own. Through Sagdeev's efforts, several found places on Vega science teams. Because there are no formal agreements for scientific exchange (like the one signed in 1972 that led to the Apollo–Soyuz flight), the Americans came on an unofficial basis. University of Arizona astronomer Brad Smith, a veteran of the Voyager missions to Jupiter, Saturn, and Uranus, attended IKI as a member of the Hungarian team that had developed Vega's cameras. A Soviet coup in unmanned science resulted from his efforts: the discovery that at the heart of Halley's lies a ball of ice and dust much darker and larger than experts had theorized it would be.

Dealing with the Soviet space program is still difficult for most foreign scientists. The basic process of designing and integrating instruments for Soviet spacecraft, for example, is problematic. The University of Arizona's Levy describes a typical collaboration with the Soviets: "You deliver an instrument, it disappears, then your data come back. I think it's fair to say," he continues, "that given their druthers, most international scientists would rather collaborate on a U.S. program."

To make the process a little easier for the participants, the Soviets have created Glavkosmos, a civilian agency meant to act as a liaison between scientists and the Soviet space industry. One result, says Brandt, is that "Sagdeev has people lining up to fly their experiments on his craft."

The Vega mission was just the first of several ambitious forays into the solar system. In 1988 the Soviets will christen the first pair of a new generation of sophisticated spacecraft for a mission to Mars and its tiny satellite Phobos.

After a 200-day journey, the spacecraft will slip into orbit around Mars to begin a 15-month survey. Passing within 300 miles of the planet's surface, they'll map the composition of the Martian rocks, search for buried ice deposits, and study the makeup and the density of the thin Martian atmosphere. But the highlight will come when the spacecraft begin their close encounters with Phobos. Each craft will then glide a mere 164 feet above the dark, battered moon and blast the surface with a

laser, vaporizing bits of the surface while an onboard mass spectrometer analyzes the vapor's composition

The Soviets also want to drop a small lander gently from each probe onto Phobos. Two designs are on the drawing boards. One would anchor itself to the moon and for a year send back data on the surface composition, measure any "Phobosquakes" and sense heat from the moon's interior. Another lander design being considered would use a springlike foot to hop across the surface like a pogo stick, analyzing as many as ten different locales in concert with a flyby probe overhead. With Phobos revealed in unprecedented detail, scientists could check out their suspicion that it really *is* an asteroid snared by Martian gravity.

The asteroids are also targets of a joint Soviet–French mission to the asteroid belt that lies between Mars and Jupiter. In the mid-Nineties two probes (named *Vesta* after the second-largest asteroid) will be loaded with equipment to study these ancient chunks of debris, which scientists believe are leftovers from the formation of the planets. Along the way, the craft will fly past Mars and fire missilelike probes called penetrators into the planet's crust to analyze the buried rock layers. The craft will proceed on a long, wandering odyssey that may take each ship past as many as four asteroids, including Vesta.

It's ironic that some of the American missions that may survive the *Challenger* disaster closely duplicate flights planned by the Soviets. Valeriy Barsukov, head of the Vernadsky Institute for Geochemistry, which plans and manages many Soviet planetary missions, tells of one such mission to study the moon. It will make detailed geochemical surveys of the lunar poles, where ice may lie in permanently shadowed craters. The same mission is on NASA's planning table, though it's not yet funded. And NASA plans a Mars orbiter for about the same time as the Soviet Phobos mission. "It's a waste of money," Barsukov says with a trace of exasperation in his voice, "and a waste of time. If we performed a mission together we would go even farther. If we repeat each other it means that we go forward twice as slowly."

But the prospect for any joint Soviet–American missions or even the coordination of two separate missions is limited to the kind of unofficial arrangements made for the Vega missions. "Right now we have very good cooperation on a scientist to scientist level," Sagdeev says. "The next step should be done via the restoration of bilateral cooperation like we had [in 1972]."

Here in the United States the National Commission on Space offered the same hope with the cautious suggestion that "selective cooperation [in space] should be actively sought with the Soviet Union." One of the first places to start is with a dream shared by space pioneers in both nations: a manned mission to Mars. Cosmonauts have already logged the equivalent of a Mars voyage in the Salyut stations with no serious ill effects. And according to Soviet-aerospace expert Geoffrey Perry of the Kettering Space Observer Group in England, it's rumored that the Soviets plan to break their own space endurance record sometime this year.

Because even the preliminary steps for a manned Mars mission would be fantastically expensive—almost certainly too much to be financed by any one nation—joint missions may be the only way to do it. And both sides appear to be receptive. In its report published last spring, the National Commission on Space recommended collaboration with the Soviets in exchanging information about their respective Mars missions. It also suggested that the two nations cooperate in a Mars sampling mission, using a U.S. rover to collect the samples and a USSR orbiter to carry them back to Earth. As the commission report put it so succinctly: "A successful joint U.S.–USSR project would multiply the scientific rewards many times."

As both the United States and the Soviet Union head into an era of more exotic and expensive space missions, we may have to pursue this solution: a solution that allows *both* sides to win.

Reagan's former boy-Scrooge makes his predictions for America's financial future and offers the best bets for tomorrow's career choices the high-technology areas, ranging from biomedicine to financial instruments

INTERVIEW

DAVID STOCKMAN

Yuppies do I think there's anything wrong with them? No Some of them stick with their work, become thirty-nine like me, have their first child and become totally enthralled by it If the so-called yuppie mentality is driven by a kind of blind status seeking or pressure to conform then it might not be healthy But as for yuppies alleged self-centeredness I don t accept that because if you're a yuppie in Fairfield County Connecticut, you go to the Red Cross Ball and help raise money The ideal society is one that harnesses self-interest These people are choosing freely and if that s the life they want, so be it "

Thus spake David Stockman a man who could be an *Übermensch* among yuppies, a man whose career—with one big hitch—is a yuppie dream come true

In 1980, as the whiz kid from the back benches of Congress Stockman was called upon to coach presidential candidate Ronald Reagan for the upcoming TV debates with Jimmy Carter Soon with Reagan comfortably in the White House Stockman helped to formulate the new administration's sweeping economic agenda and was subsequently dubbed director of the Office of Management and Budget (OMB) By any measure Stockman's task was awesome to balance the inflation-swollen federal budget even as he implemented the President s mandate of bold tax cuts and increased military expenditures

As architect of the Reagan revolution that would make a frontal assault on the so-called American welfare state Stockman had a less-than-simple assignment Congressional resistance to Social Security cuts was one thing, but it became clear that the President himself had doubts Reagan was an incorrigible optimist too compassionate—or too "political"—to approve the massive spending reductions basic to his program Likewise the

PHOTOGRAPH BY WILLIAM COUPON

President's advisers from Edwin Meese and Michael Deaver to the First Lady were unwilling to buck the media. The result? A national debt greater than that of all Reagan's predecessors combined. In the end politics had triumphed over ideology, leaving a woeful Stockman to conclude that the program had been "radical, imprudent and arrogant" the administration's promises little more than "hot air."

Raised on a Michigan farm, Stockman, having resigned his Cabinet post in August 1985, is now a director at the Wall Street firm of Salomon Brothers. Prior to his OMB appointment, he represented southern Michigan in the U.S. House of Representatives, where he was sent after graduating from Michigan State University and studying at Harvard Divinity School. His political odyssey, starting with Goldwater Republicanism, has led him from Marxist activism during the Sixties to the fiscal conservatism underlying his recent best seller *The Triumph of Politics*, which chronicles the "shocking fiscal ignorance and intransigence" in Washington.

Writer Peter Manso joined the administration's former wunderkind to talk about his controversial book and years in the corridors of power, as well as about the future and where we all may be headed. Manso reports: Stockman received me at the swank Beverly Hills Hotel, obviously tired after a full day of interviews and TV shows. Nonetheless, he was willing to engage, eager to do so, in fact, when challenged on his pet assumptions. Economics as a "voodoo" science, the equity of increased taxation, his foes who have criticized him for "stabbing the administration in the back," even yuppies and the plight of the American farmer—nothing was off-limits.

Omni: The bare facts of your biography paint a picture of an enormously ambitious and successful odd man out, growing up on a Midwestern farm, going on to Harvard, Congress and eventually, at thirty-four, joining the Reagan Cabinet as a key player. A wooden description, granted, but essentially on the money?

Stockman: Yes, as the oldest child I was probably under the greatest pressure to perform, to succeed and achieve. There were five kids, all within six or seven years. My parents were very work-ethic-oriented, bedrock Republican, fundamentalist Christians. The assumption was that people are responsible for their own fate. What was important wasn't just that I grew up on a farm but the culture that went with it—a sort of black-and-white view of the world. Sobriety, thrift, responsibility and neighborliness were the touchstones. If somebody was injured, everybody went and picked his crops. If someone had a fire, everybody helped rebuild his barn. It wasn't until I got to Harvard that I realized how unique this was. I had done a lot of book reading, but I still betrayed the parochial, traditionalistic background from which I came. It was clear I couldn't compete on money, family background, manners, or world travel. The only way I could hold my own was intellectually. I wasn't content with being an outsider, so I found myself changing—and working very, very hard.

Omni: When you first went to Michigan State, what did you major in?

Stockman: Agriculture, to learn how to be a scientific farmer and go back, whence I came. That lasted only a year and a half. An explosive horizon opened up, and before long I couldn't see much sense in going to botany class. I wanted to study history, political science and philosophy.

Omni: In your book you repeatedly use the term *rabbi* in discussing mentors such as John Anderson and Patrick Moynihan. Where do you, a Midwestern farm boy—

Stockman: [smiling] Get the term *rabbi*? Over the years I've come to admire Jewish culture, that ethic. I was exposed to very intellectual Jews, and since I had now made learning, thinking primary values, it was attractive to me. *Rabbi* implies a teacher, an intellectual leader who sheds light on mysteries, while *mentor* has a more pedestrian connotation, as with somebody who just shows you the ropes. From college on, I was on a quest to know the "truth," and I believed I couldn't arrive at a correct view of the world unless I was immersed in the truths of history. The underlying quest was to find the grand doctrine. There are good and bad societies, so the question became, "What are the truths that tell you how to proceed along the better path?"

> *"Reagan reflects the American mind, which itself is a little schizoid. That's why he's so successful. He plays to the ambivalence of the public."*

At various stages I answered the question in different ways. I arrived at Michigan State University during the period of great campus upheaval, the radicalization of the American student body during the mid-Sixties. Suddenly the old inherited Christian propositions collapsed entirely, and there I was, a sophomore in college, my worldview fallen apart. I had to construct a new view in an environment where radical political economic, and cultural notions were omnipresent. Out of that came what I'd call a kind of quasi-Marxist outlook.

Omni: To what extent were you involved in the antiwar movement? Did you get arrested or burn your draft card?

Stockman: No, but I went to all the meetings and demonstrations, and I absorbed an enormous amount of literature and information about why the Vietnam War was a mistake, how it fit into a larger pattern of what I believed to be imperialistic American foreign policy. I never became a hippie, but my appearance changed, too. I let my hair grow and wore jeans and an army jacket in order to express my state of rebellion. When I'd go home I'd get into rather intense arguments with my father, even my grandfather; we didn't stop speaking to each other, but these weren't parlor-room discussions either.

By my senior year the activists had moved to more aggressive provocation, even violence in some cases. The thing that turned the corner for me was the famous march on the Pentagon in '67. A busload of us drove to DC—sandwiches, sleeping bags, the whole thing. I saw people trying to turn themselves into martyrs by getting clubbed, then running back through the crowd covered with blood in order to incite anger. As a result I retreated from activist involvement and began desperately to search for new answers. I wasn't going to embrace the war or conclude overnight that the "US of A" was okay, but I found an intermediate position through one of the local campus pastors who had been a student of Reinhold Niebuhr.

For me Niebuhr provided a bridge back to the mainstream. Through his writings I developed a more sophisticated and ambiguous view of the world. I saw that this primitive, radical activism was fairly juvenile and mindless. The principles couldn't hold. The notion that if you strip away the shackles of ruling-class economic interests this primitive savage suddenly becomes an altruistic, socially cooperative, benign and creative person couldn't hold. Niebuhr recognized both impulses: his famous aphorism is that man's capacity for justice makes democracy possible and his inclination to injustice makes democracy necessary. Democracy both liberates and constrains, and this was compelling.

Omni: Is there any basis to the charge that you went to Harvard Divinity School to avoid the draft?

Stockman: Well, it's basically accurate, although at the time I had the refined rationalization that I was indeed interested in theology not as a matter of practicing religion but as a philosophical tool. With Niebuhr as my great model, I told myself that I, too, might become a great political or philosophical scholar. But this was pretty thin gruel. It didn't last very long.

Omni: Neither did the optimism you brought to the White House. The gist of *The Triumph of Politics* is that pure ideologues like yourself got plowed under by pragmatic politicians. To what extent do you see yourself—as opposed to Ed Meese, Michael Deaver, or even Reagan—as responsible for the administration's economic policies?

Stockman: I can't claim sole responsibility, but I was the person who pulled it all to-

gether, the guy who provided the intellectual rationalization and fleshed out the details of the blueprint. I thought that if we implemented this plan, the whole social order and economic system would be better off. But the plan was simply too sweeping, too radical. Whatever its theoretical merits, it had the unintended effect of unleashing forces in the legislative process that produced some very unbalanced and unsustainable results, namely, a huge tax cut, coupled with very little change in spending, which resulted in a radically unbalanced fiscal policy.

Omni: Might the Reagan revolution have taken a different form if someone else had been heading the OMB?

Stockman: Yes. There was great skepticism about supply-side economics among rank-and-file politicians in both parties. My contribution was that through frenetic efforts for about forty days, I pulled together enough detail and put enough plausibility into this huge framework of policy change that when launched, it became a contender, a serious alternative.

Omni: You packaged what had otherwise been amorphous and theoretical?

Stockman: Correct. If the administration had simply come in in mid-February and said, 'Here's the Kemp–Roth tax cut, this huge rate reduction and the business-tax reduction with it, now we're going to appoint a task force to figure what we can reduce on the spending side of the budget,' I think the tax cut would have been buried early on. But I laid out a sweeping, mathematically consistent, operational blueprint. What had been a theory, merely a proposition, was translated into a document of policy with enough plausibility to it that Congress had to take it seriously.

Omni: To what extent was Reagan himself convinced by this 'document of policy'?

Stockman: He was committed to the tax reduction. But he'd been given a lot of sloppy advice during the 1980 campaign by Ed Meese and to some degree by [economist] Marty Anderson. Reagan came into his presidency thinking that his campaign pledge to cut taxes, raise the defense budget, and curtail the growth of the domestic budget was feasible. They had put together little five-page papers showing how it could be done, and this was shoddy, superficial back-of-the-envelope stuff. Because Reagan is not a detail man, it was enough for him.

Omni: So he never actually read your 'blueprint' of Reaganomics?

Stockman: I don't know if he ever read the whole white paper. He sat through several hour-long blizzards where we went through all of these cuts item by item, a half page at a time, saying this is how we're going to reform food stamps, here's what we're doing in the public employment program. In terms of the basic principles, he understood the program. In terms of any deep comprehension about, say, the policy conflicts being raised by eliminating farm subsidies or dramatically scaling back federal aid to local education or reforming low-income benefit programs, I don't think he had much comprehension about those line-item cuts.

Omni: After only two months in office was there a disparity between campaign promises and what the administration was actually doing?

Stockman: There was a disparity in the sense that abstract slogans about big government and an out-of-control budget affect the public powerfully, but when you move from campaigning to governing you don't decide on a line item called 'big government.' You look instead at Social Security, education benefits, or veterans' health care. And that translation is where any link between Reagan as a political phenomenon and Reagan governance falls apart completely. There is a startling disconnection between Reagan the campaigner, the scourge of big government, and Reagan the chief executive officer of the American government.

> *'I sat there at the control dials of this mass of numbers measuring what the federal government really is. And I concluded that what comes out of the White House is all hot air.'*

In the second instance, he has proved to be very pragmatic. Constituencies are given their due, and if they demonstrate, he's willing to call it a day. That's what he did on Social Security, on farm programs, even aid to education. Remember, we were going to abolish that education department monster. It was central government insinuating itself into the classroom. Well, six years later, the Department of Education is fully intact, with the biggest budget in history.

Omni: Meaning Ronald Reagan does not understand the words coming out of his own mouth or that he regards the presidency with professional cynicism?

Stockman: No, it's a little deeper than that. He reflects the public mind, which itself is totally schizoid. When we hear slogans about the excesses of the federal government, there's overwhelming agreement; when it comes to the particulars of what the government actually is, what it does, and who it supports and funds, there is reluctance to change anything. That's why Reagan is so successful. He plays to the ambivalence of the American public.

There's a *big* element of self-deception, no question. That's where I finally fell out of bed, because I started as an ideologue. I had grand views of how you govern society and the virtues of free markets versus government regulation, the dangers of subsidizing welfare populations, and so forth. But I was also the numbers guy. I sat there at the control dials of this mass of numbers measuring what the federal government really is, bit by bit, particular by particular, and after four years I had to conclude that what comes out of the White House typewriter is all *hot air*.

There's no consistent, credible, or serious intellectual content to Reaganism, only a very popular kind of rhetoric—and by *content* I mean ideas, a sense of reality and facts.

Omni: Has Reagan been more or less remiss than his predecessors—Carter, Ford, Nixon, Johnson, or JFK?

Stockman: The gap between Reagan's policy position and his public rhetoric is wider by orders of magnitude than in any administration we've ever experienced. I know it's true, and it's why some people are so upset about my book. What I've done is show not that the emperor isn't wearing any clothes but that the emperor's rhetoric is empty. You get all these apologies. 'Well, Stockman's revolution failed, he's a radical conservative, but Reagan's a lot smarter, 'cause he's got his feet on the ground and he pushed as far as he could.' But that's upside down. Ask the President what he thinks about Social Security, he'll tell you: 'A total mistake, the whole system ought to be made voluntary.' That's far more radical than any idea I've ever had, but he never pushed it. Instead, he's just been giving the same speech for twenty years.

Omni: During your tenure as head of OMB, why didn't you just throw a tantrum, say, 'Dammit, Mr. President, we're bankrupting our whole plan here'?

Stockman: I did, but you can't throw tantrums in front of the President. You try to be as forceful and as insistent as possible, but you don't rant and rave. Reagan is such an even-keeled, unflappable kind of personality that voices don't get raised. With Lyndon Johnson, say, somebody might have had enough nerve to stand up; he either got thrown out on his rear or the President changed his mind. But with Reagan, issues never got discussed. People will disagree violently with his policies or plans, then go in there and make their point in a very low-key, even sheepish way. There's a certain tone, a certain modus operandi that precludes head-on collisions or eyeball-to-eyeball confrontations, with the result that choices never get squarely posed.

Omni: Was it ever possible for you to meet in private with Reagan, or was he surrounded by Meese, Deaver [James] Baker, and the rest of them?

Stockman: Oh, always surrounded. One on one was against the rules. I tried once or twice, but basically I wasn't the gatekeeper. Deaver and Baker were, and they weren't going to let anybody side-door

them. With the possible exception of the secretary of state on sensitive foreign-policy matters, nobody had access to Reagan without the guardians. Reagan has this notion that the fellows, the team, should round-table and come to some collective conclusion or agreement. It's like, 'Our side will always come to the same answer.' Only that isn't true, it isn't even close.

Omni: Coming back to Reaganomics, could the 'failure' here have been averted?

Stockman: Yes, by recognizing that we'd way overreached in the early plan. Also, if you felt it was safe to hold the defense budget at 1980 levels, you could have had the large tax reduction and ended up with a decent-size deficit. Mathematically you can pencil it all out, so no, there was no fundamental incompatibility.

Omni: Considering the fact that what you were scripting was the national budget and beyond that the economic welfare of American citizens, weren't your mathematical abstractions a kind of hubris—an ambitiousness, an arrogance, not only on your part but on the part of the administration as a whole?

Stockman: Yes. I should have taken the forecast [of high inflation] deadly seriously because I had enough sense to know that budget projections are highly sensitive to forecasts and that we could have been heading off the cliff. But it was panic, a blitzkrieg. We were working so fast that I was going through one hundred decisions a day. Look, you drive a car for a long time, you know exactly what the steering play is, okay? At the time I knew intellectually, in the abstract, that long-range economic assumptions make a difference on budget estimates, but I didn't have any deep comprehension, nor for that matter the sensitivity that sort of caution light, the pounding on my brain saying, *Look at that real hard now because if you're wrong the whole thing may be a fiasco.*

Omni: And simultaneously you're on a tremendous high? You're thirty-four, the superstar of the new administration.

Stockman: There was the sort of attitude, "Now we're in charge," and we thought we'd unlocked the key to the future, so whatever we concluded, even if it was hasty, superficial, or inconsistent, it was going to be all right. Me, I was on the cover of *Newsweek*. I was the guy who made it all happen! Baker, Meese, Deaver, the rest of them were waiting for me to fill in the details, and what I came up with was supposed to look like what they'd been promising.

Omni: Recently you bought a house in Greenwich, Connecticut. Did you take an adjustable- or a fixed-rate mortgage?

Stockman: Fixed. Because I believe we're at acceptable lows on interest rates and I want to lock it in. Why?

Omni: You want to play it long, not short? You're insisting on a certain kind of prudence, a safety net, correct?

Stockman: Yes, but that isn't relevant here.

Omni: Arguably it is. It points to a disparity between the way you manage your personal finances and the way you approached the country's—yet at the same time you fault Reagan for a double standard, right?

Stockman: Well, if you give me some time to answer, I will. If you're going to make some kind of prosecution out of it, I won't.

Omni: Okay, then looking back, what would you do differently?

Stockman: I'd say it was pretty foolish to assume you could go after forty-four billion dollars in additional cuts out of middle-class entitlement programs. But back then nobody could have known. This was the first review of the huge domestic budget that had built up over thirty years, and through things like Proposition 13 in California, not to mention the election of Reagan and a Republican Senate, it sounded like the public was saying, "Enough is enough, clean out the attic." The triumph of politics here is that there was confusion in the public mind as to what it wanted.

> *"I was on the cover of* Newsweek. *I was the guy who made it all happen! Baker, Meese, Deaver, and the rest of them were waiting for me to fill in the details."*

Omni: So you're blaming the public as well as the administration?

Stockman: Well, yes. I think you have to blame the public that wants to have both a generous government and low taxes. The public will always want more than it can pay for. This ambivalence is what biases the system toward deficit and inflationary finance. The only thing that keeps democracies in balance is sound political leadership. While the conservative party has traditionally been the keeper of fiscal responsibility, the giant mishap of the Reagan revolution has resulted in a conservative party rationalizing unprecedented deficit finance. What's happened is that the country has been put through five or six years of free-lunch economics endorsed by *both* parties. The Republicans aren't very credible anymore.

The consequence of cutting our spending-reduction package was that once again the interest groups would win, and I was trying to prove that we could have the tax cut by driving this big reduction package through first. It got off track because we ended up not cutting very much at all, then turning on the green light for tax cutting. Who in the Cabinet was heavily responsible for not explaining to the President that we hadn't got very far and needed a big revision of the plan, that it was way out of sync? Ed Meese. The guy simply can't cope with hard reality. He goes on singing the same song, time after time, no matter how overwhelming the facts. He's got a two-track mind, it's that simple. He'll keep repeating, "We're here to cut the size of the federal government," then continue making decisions to compromise and *not* cut down this federal government. And he'll never recognize the dissonance.

And Deaver never cared; he was totally preoccupied with image. Meese was supposedly the President's chief domestic-policy adviser, conversant with ideas and policy, but he's got utterly inconsistent global views. That was documented time after time. When it came to high-level political explosions like Social Security, Deaver was always for getting the President out of the way because it didn't make for good evening news, good poll ratings, and so on. Our plan required a major reform of Social Security, but Deaver would go over to the residence and tell the President, "This is dangerous."

Omni: Why, in late 1981, did you agree to an interview with *The Atlantic* magazine that resulted in your being "taken out to the woodshed"?

Stockman: It started when I was at the peak of my supply-side epiphany. I thought things had degenerated so far under the old Carter–Keynesian policies that we were at the point of convincing the opinion-making elite that we had the answer. Knowing the power of the media, being a Washington creature myself, I thought I'd spread the doctrine, justify its nonkookiness. My engagement with William Greider, the author of the article, was part of that process. We didn't formalize the rules very well, except that he wasn't going to write anything for the daily press or quote anything I said. Then at some point down the road he'd write an article that we'd discuss when the time came.

Omni: How traumatized were you by the fallout from the *Atlantic* article? Did it seem to you like this was going to be the end of David Stockman?

Stockman: There were a couple of days when I might have had that impression, but then it cooled down and I figured I could cope with it. Overall I was taken aback because I hadn't fully appreciated the power of the press to instantly mythologize phrases into profound events. I had seen it happen from a distance, but now I was on the receiving end, and I just couldn't understand it.

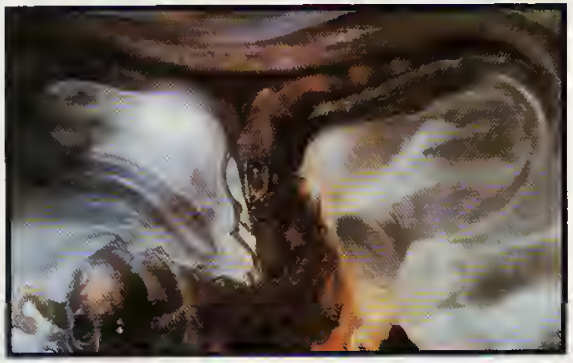
Omni: Jim Baker, the President's chief of staff, put it all on the line, saying, "Stockman, I want to see your ass dragging on the floor. You're going to be the most humble son of a bitch around here." Were others in the Cabinet so direct?

Stockman: No, the rest of them were double-talking, mealymouthed types. Baker

CONTINUED ON PAGE 114

Nightmares weave the tapestry of horror for artist H. R. Giger's

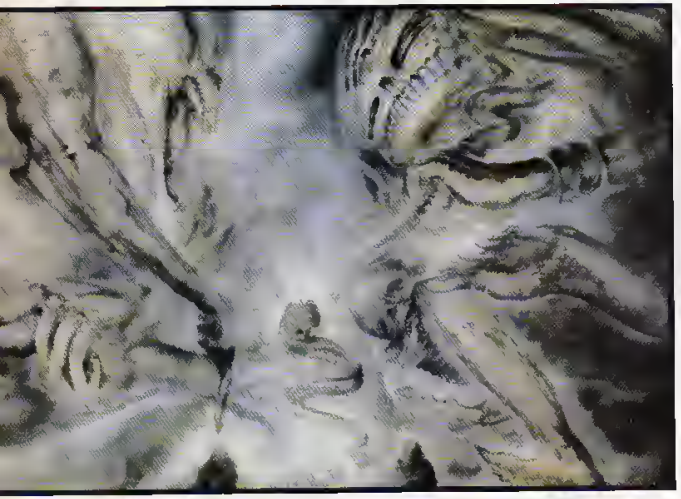
DEATHSCAPES



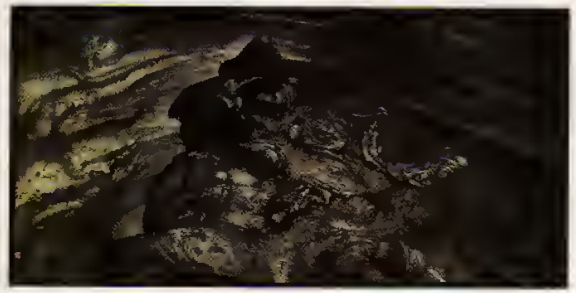
Shrunken heads hung like candied apples, pale cadavers that grin back at death, swirling tornadoes of skin and scales that split like pods to engender themselves. In smoke as in sleep we see shadows of things that are seldom revealed to the conscious mind. No one captures those shadows better than H. R. Giger, the master of fantastic art whose work has been seen in *Alien*, *Dune*, and *Poltergeist II* (for which the sketches shown here were made). Born and raised in a small Swiss town, Giger (rhymes with *eager*) early on showed a

BY ROBERT MASELLO

predilection for the grim and the occult, he painted his bedroom black, collected antique guns and knives and in the narrow hall above his father's pharmacy operated a 'ghost train' that for five centimes' admission, sent his little schoolmates into paroxysms of terror. Around the same time' he recalls, 'my father received a skull from a pharmaceutical house that I immediately took possession of. It was my first contact with death. But not his last



"A Swiss with no regard for time, Giger has set his watch for eternity, counting out the seconds until the apocalypse"



using an airbrush, Giger summons up visions of an afterworld in which death and decay prevail. "I try to switch off my thoughts to bring the debris in my mind uncensored into the daylight." Some people wish he would leave such stuff in the dark. "People like this think of themselves as healthier than me," he says. "But if they are honest, they will be unable to deny that they too are often tortured by evil thoughts or pursued by terrible nightmares." What Giger offers then is a public exorcism, a ritual bath of horror in which the afflicted can be cleansed. DD

TECH TREK

CONTINUED FROM PAGE 54

lies in speeding up airflow within a ramjet. The answer is the supersonic combustion ramjet, or scramjet. NASA has been working with scramjets at its Langley Research Center, where experiments have shown that they can be built with simple designs to reach speeds of Mach 12.

Engine builders at the Pentagon's Defense Advanced Research Projects Agency (DARPA) have produced a breakthrough by using supercomputers to study scramjets. DARPA's computer-generated scramjets can take off from a runway and reach Mach 15, possibly Mach 25. DARPA is currently seeking $200 million to build a prototype engine, which is expected to be ready in 1989.

Let us imagine then that such scramjets are powering our huge, sleek craft that will ferry us into space. It accelerates slowly on the runway but gathers speed as its engines give their initial boost. In a minute we are over the open ocean, which falls away as we gain speed and altitude. Soon the aircraft levels off and cruises.

Then the captain announces: 'All passengers please return to your seats and fasten seat belts. We are beginning main acceleration.' The muted rumble of the boost is soon drowned out by a louder and more insistent roar as the scramjets increase power. Now the ship comes alive. You can feel the thrust; the shudder as it passes Mach 1. Down below, the clouds are falling away, the sky deepening from dark blue to a velvet purple. The clouds part, and the Bahamas appear amid the ocean as clear as on a map. The emerald green of the adjacent shallow seas brings back memories of last year's vacation. Now the sky is almost black, and—is that the curvature of the earth? There is no vibration, but on the cabin bulkhead a digital Machmeter displays the increasing speed: Mach 4, Mach 6, on up to Mach 22.

At that speed, close to orbital velocity, and at 180,000 feet we feel a sudden new jolt, another acceleration. The rockets have come on, and now the acceleration really gets strong. It is uncomfortable to lean forward to look out the window. Experienced astronauts wouldn't bother, but you don't want to miss anything. In less than a minute the roar of the rockets dies away, and the acceleration slows. We are in orbit. A sign lights up: CAUTION WEIGHTLESSNESS. NO SMOKING. FASTEN SEAT BELTS. Then out the window the destination appears: that big collection of tanks and cylinders that will be home for several months.

Such hybrids of air and space—even the earliest versions, which DARPA hopes to build and fly well before the year 2000—will make the space shuttle nearly as obsolete as the Wright Brothers' plane. The shuttle was largely designed in the pre-microchip era; its onboard computers are rather less advanced than the ones you can buy at Radio Shack. One consequence is that it takes an army of ground crews to prepare it for launch. A cynic could say that if you think of the post office fouling up some simple task, then it will not surprise you that it takes 12,000 government employees to launch the shuttle. But its successors will rely on artificial intelligence to speed things up. Expert systems, running on advanced computers, will interpret instrument readings with the skill of an experienced Kennedy Space Center operator. Artificial intelligence will provide quick launch and turnaround for more than tomorrow's supershuttles. There will be rockets that will almost never return to Earth, but instead will fly between space stations and the moon.

The lunar base, however, may not be where the real action is in 2019. All along we can expect that the Defense Department will be pursuing its programs for defense against nuclear-tipped missiles, popularly known as star wars. The name is more apt than people realize. One of its spinoffs may well be the first spaceship suitable for interstellar flight. And while such a mission will take place later rather than sooner, still, even the early versions of this ship will fly to Mars in as few as nine days.

The star wars starship will rely on laser fusion. A powerful, rapidly pulsed laser will zap small pellets of fusion fuel, which will explode like miniature hydrogen bombs. These explosions will produce superhot plasmas that expand at speeds of several percent of the velocity of light. A superconducting magnet, built as a ring, then redirects the plasmas as a jet out the back.

These lasers will need specialized optical systems to produce the extremely short bursts of laser light needed for fusion. The first such system is currently being installed on the Aurora excimer laser at Los Alamos, which is to be used for research in laser fusion. As for the pellet, California's Lawrence Livermore National Laboratory now has in operation its Nova laser, the world's largest. It is shooting energy bursts at scale models of fusion pellets.

The first test of full-size pellets is to come in October 1987 at Sandia Labs in New Mexico. This will involve the Particle Beam Fusion Assembly, which was managed by Gerold Yonas, now the chief scientist for star wars. It represents the world's first fusion test device whose energies approach those needed to drive a starship. It is slated to go into operation sometime soon.

In 2019, then, the first of these rockets could be in use, probing far beyond the moon, preparing to open up Mars and to follow the moon base with one on that planet. And in the research centers with their computer-aided design systems, plans may well be afoot to build new, more advanced craft of this type, equipping them with large tanks of fusion fuel. These will then proceed beyond the solar system into the vastness of interstellar space. ∞

"Shall we have coffee in the third dimension?"

UFOs emanate from traumatic events, which thrust us toward a higher state of consciousness

ANTI MATTER

UFO UPDATE

Pundits have attributed UFO sightings to alien spacecraft projections of the collective unconscious or misinterpretation of satellites and stars Now from John F Kennedy University (JFKU) in Orinda California comes another explanation According to a recent study conducted under the auspices of the university's consciousness studies department UFOs may be remnants of the same psychic flame that spirals into the brilliant almost blinding light some people see before they die

Lorraine Davis who holds a master's degree conducted the study She started the project after attending a JFKU seminar on the near-death experience or NDE Led by University of Connecticut psychologist Kenneth Ring—one of the first academics to study the NDE—the meeting described among other things the altered state characterized by lights and long-dead relatives beckoning from beyond Struck by the similarities among UFO contactees and near-death subjects Davis decided to make her master's thesis a comparison of the two

To carry out her study Davis borrowed an NDE questionnaire developed by Ring and sent it to 261 people reporting UFOs or contact with extraterrestrials She received 93 replies and proceeded to compare them to those answers given by Ring's NDE subjects

As it turned out Davis says there were three changes in those who said they'd either hovered near death or seen a UFO Their attitudes toward themselves and others became less egocentric, their attitudes toward religion shifted from atheism or narrow sectarianism to a more universal spirituality and they reported an increase in psychic ability

UFO sightings and NDEs are both examples of altered states of the human evolution toward higher levels of consciousness Davis concludes 'The UFO participant was thrust into this psychic state by a precipitating event, just as the NDE subject was transformed by the nearness of death'

These conclusions, though have caught some of Davis's subjects off guard Are you saying I imagined the whole thing?' replied at least one angry participant Davis says no "If the UFO experience does take place in an altered state of consciousness she says perhaps a nuts-and-bolts machine *is* materialized for a few minutes Who knows? It's certainly possible to perceive and experience in other states of consciousness sometimes with an even greater sense of reality than that which we experience on a day-to-day basis

But NASA psychologist Richard F Haines author of *Observing UFOs* says that Davis and others in the field should spend more time validating methodology A major problem with this sort of transcendental analysis he says is that you actually generate your own terminology as you go along There is very poor agreement among people concerning even the most general concepts in this field

Davis does have one avid supporter though the respectable Ring He says, "As long as there's a sudden traumatic precipitating event—approaching death is an example—the transcendental experience can occur'—*DENNIS STACY*

SWOONING GOATS

The first time Edward Lawson came face-to-face with one of veterinarian Renfrow Hauser s goats, it stiffened and then fell over seemingly dead

"Then I came upon another one, says Lawson, now manager of Hauser s Mount Airy North Carolina, farm and blessed if it didn t fall over, too "

The goats Lawson soon learned, weren t dying from fright Instead they suffered from a strange malady known as myotonia, which blocked the uptake of neurotransmitters and rendered the animals stiff as statues when startled in any way Hauser, who bred the fainting animals maintained the largest population known

According to Karen Hauser Renfrow s wife her father-in-law brought the first of the fainting goats to Mount Airy in 1978 Though some of those original goats bred with nonswooners, most of their descendants carry the trait

Today, Karen Hauser explains, 25 swooning goats live at the ranch "They eat grass and clear underbrush but basically they serve no purpose except as pets she says A lot of people like to come and watch them keel which they frequently do in response to low-flying airplanes loud yelling and even clapping hands '

The Hausers however, have found a partial cure The more contact their goats have with people the less they faint 'Still says Renfrow Hauser 'most of the goats *do* regularly collapse A lot of

times we'll come up on them in a pickup truck and I ll blow my horn, and half a dozen of them will just fall right over in a ditch "

—Sherry Baker

"Truth is independent of fact it does not mind being disproved It is already dispossessed in utterance "

—Lawrence Durrell

"You k'n hide de fier, but w'at you gw ne do wid de smoke?

—Joel Chandler Harris

[illegible]

The problem that brought the sixteen year old girl to the office of British physician Conrad Harris was to say the least bizarre The girl who made reproduction antique dolls at her London home was in perfect health But her dolls looked deathly ill Black speckles always appeared on their heads after the second firing of lay And she wondered if her hands which tended to sweat were to blame

Harris now a University of Leeds professor was in

trigued by the question and gave the girl a simple test Before the second firing she was to mark the outline of a cross on a doll s head with her fingertip Then she was to repeat the experiment on a second doll this time while wearing rubber gloves Since the speckling occurred only when her hands were bare ' Harris says we knew her skin was to blame '

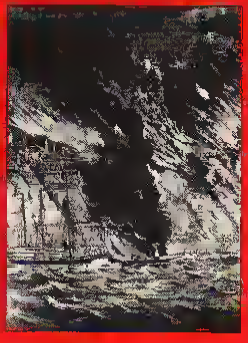
Wondering whether the speckles might consist of sulfides Harris then asked his patient about her diet And sure enough she confessed to eating quantities of sulfide-rich garlic When she stopped eating garlic for a week the speckles went away Apparently Harris concludes the girl had a peculiar metabolism that didn t allow her to excrete sulfides through the urine but only through sweat.

As it turns out the experiments have significance for the antique doll industry at large Craftspeople from Italy, France Germany and other garlic eating countries generally find about 10 percent of their dolls ruined by speckles And genuine antique china dolls which have been made only in France and Germany are often speckled as well The problem was previously ascribed to dust or mold in the kiln But Harris concludes 'this assumption is probably wrong '

—Ivor Smullen

[illegible]

In 1871 Chicago was a young metropolis rapidly ex



panding in both size and importance But danger was afoot Prairie fires raged throughout the unusually dry summer and fall And on October 7 a local fire destroyed four blocks near the bustling center of the city Then starting the next day what came to be known as 'the great conflagration devastated most of the city

The cause of the fire has been sought ever since Now from Chicago film writer Mel Waskin author of *Mrs O Leary s Comet* comes a strange but viable theory The cause of the destruction that swept through Chicago as well as towns in Michigan and Wisconsin says Waskin was Biela s Comet.

In 1845 Waskin explains, Biela s split in half becoming two comets, each with its own head and tail The twin comets slowly drifted apart And he theorizes as they separated their orbits changed slightly enough to affect their approach to Earth Thus one of them may have returned in 1871 a year earlier than expected '

But Richard Schmidt of the U S Naval Observatory thinks Waskin has taken liberties with orbital mechanics 'By 1852 the two comets were just half a day apart he explains ' Then in 1866 under favorable viewing conditions they weren t seen at all, and astronomers decided they had broken up.'

Waskin however says the anecdotal evidence speaks for itself Eyewitnesses in Chicago reported blue flames through basement windows In Michigan incredibly intense heat left people externally unmarked but dead, the coins in their pockets melted And in Wisconsin balloons of fire and hot sand fell out of the sky '

If Waskin s theory stands up to scientific scrutiny the 1871 Midwestern fires would represent the first recognized incidence of a comet striking a densely populated area of the earth —Kevin McKinney

ANTI MATTER

THE CRYING BOY

The painting looks innocent enough. Called *The Crying Boy*, it depicts a child with a tear nestled on one plump cheek and is a big seller in British department stores. But it has, at least according to some people, a dark and malevolent past.

Indeed, retired Yorkshire fireman Alan Wilkinson has spent the last ten years building up a weird dossier on the work. Time and again, Wilkinson claims, firemen rummaging through the remnants of a powerful blaze have found *The Crying Boy* totally undamaged, without even a smoke mark to mar his face."

In Yorkshire alone, Wilkinson adds, the picture has been discovered in pristine condition after 50 fires. A typical case was a house that was almost gutted last year, he says. Pictures in every room were burned. But *The Crying Boy* was found hanging over the hearth with not a smudge.'

Spurred by Wilkinson's claims, local newspapers eventually suggested the picture was jinxed, citing it as a possible cause of the fires in which it was involved. One woman subsequently brought Wilkinson her copy of the picture and asked him to destroy it. 'I left it in the fire-station office," Wilkinson says, "and the same day an oven in the canteen kitchen overheated and burned all of our dinners."

But Jenny Randles, author of *Beyond Explanation?* and a student of coincidences, discredits Wilkinson's claims. 'There are tens of thousands of copies of this picture," she says, "and tens of thousands of fires every year. Very few of these fires are totally destructive. So the odds in favor of the picture surviving quite a few fires are surprisingly high."

As far as Wilkinson is concerned, though, Randles's explanation won't fly. When colleagues held a retirement party for him just recently, they presented him with a framed copy of the print. "I refused to accept it," he says. —Ivor Smullen

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According to the Daily Telegraph *of January 10, 1952, it rained rice on Mandalay, Burma, where people in the streets gathered up handfuls. 'We have no records of rice falls in the West, where falls of wheat are the most common type reported.'*

—John Mitchell and Robert J. M. Rickard

'From the east, light.'

Latin proverb

PSYCHIC MONKEYSHINES

When San Francisco City Supervisor Louise Renne visited the local zoo in Cork, Ireland, not long ago, she heard of a "diviner" who had used his psychic powers and rod to locate a monkey only minutes after it had escaped from its cage.

"Curiously enough," Renne explains, "we also had some missing monkeys." Indeed, officials at the San Francisco zoo were frantically searching for a female patas monkey and her four-month-old baby (shown above). And Renne suggested they enlist the aid of psychics, too.

Though Renne says her comments were "lighthearted," a reporter wrote a story about her so-called request for psychic help. As a result, Renne's office was flooded with offers, premonitions, and advice for three solid days and nights.

One seer, for instance, claimed that the baby monkey had been run over by a tricycle. Another man insisted that the monkeys were sitting in the Sunset Bar eating ravioli.

"I talked to that guy for a long time," says Kathi Zastrow, of Renne's staff, "and he was very, very serious."

Meanwhile, over at the zoo, public affairs director Ellen Newman was amused. "We knew the monkeys' general location within two days of their escape," says Newman. "We didn't need psychics for that. The problem wasn't finding the monkeys; it was *catching* them."

According to Newman, a primatologist who studied the patas monkeys in Africa was called to help with the capture. "We know that those kinds of monkeys establish a territory, and so the researcher and a team of volunteers charted sightings of the animals and kept watch on the area where they had been seen. A trap was set up, and finally, six weeks later, they were caught."

Zastrow notes that some of the psychics' predictions about the monkeys' whereabouts were not too far off the mark. "But," she adds, "it wasn't something that was exactly hard to guess. The monkeys were found in a forest up the hill from the zoo. Now, if you were a monkey, isn't that where *you'd* go if you escaped?"

—Sherry Baker

"The body of the world which is broken into pieces is the body of the god."

—Sigmund Freud

HOUSE ARREST

CONTINUED FROM PAGE 46

building on the marshes outside Newark New Jersey The building was not much to look at as Schmeck's main interest at the time was in-ground construction 'Looks like a cesspool tank that someone forgot to bury,' said one of Schmeck's critics But the building was to trigger an architectural revolution Schmeck got his big break when Rudolf Lang, a futurist and industrialist who had heard him speak commissioned him to build the company s new headquarters 'Make it breathe Schmeck,' Lang told him

By using his design the company spent 50 percent less on electricity than it would have for a conventional building its size Lang was pleased By the end of the year however odd things began happening Lights and heaters went on and off every night through the long winter of 1988 Worse, these phenomena occurred on the sixth floor where Lang who was chairman and chief executive officer and 45 MBAs had their offices There was talk of poltergeists There was talk of killing Schmeck

Lang ordered the architect to find out what had gone wrong with the building s CARP Schmeck's patented computer-aided real-time pneumatics system Schmeck, troubled by his loss of face took extraordinary measures He spent two weeks on the sixth floor camped in an orange nylon tent so that he could observe CARP without himself tripping the sensors

On Sunday night of the last week, Schmeck discovered what had gone wrong At 11 55 PM the lights in the sixth-floor corridor switched on He looked around the room and saw nothing But as his eyes adjusted to the new brightness he noticed faint movement near the main sensor He crept from the tent on all fours There on the ceiling by the sensor was a cockroach 'So " he whispered

And the revolution began

In his pioneering monograph in the *Progressive Architect* Schmeck betraying a weakness for anthropomorphism that would later become his trademark, named the cockroach Adrian and explained that he could solve the problem by adding heat sensors Like snakes houses can now tell large creatures from small

Schmeck went on linking networks of sensors to an increasingly elaborate array of limbs as he called them blinds shutters awnings heat pumps Trombe walls greenhouses and other devices that could help get the most out of very little energy He built an early prototype into a small hill near Sioux Falls South Dakota to test his designs against hot summers and cold winters The house faced south In summer the central computer adjusted blinds and awnings to reduce the amount of solar heat, then, at night, when the costs of electricity shrank the computer instructed the air conditioning system to freeze water into an ice slurry store it then pump it through the home during the day The earth covering the roof and walls moderated temperature extremes

His home was much smaller than conventional houses, yet studies found visitors perceived it to be larger than it was He crossbred the Japanese house with the Murphy bed to produce a more fluid living space with few walls and built-in chairs couches and cabinets The dining room for example, doubled as a guest room He designed the hardwood floor to fold up like a shutter, exposing a queen-size bed sunk into a three-foot-deep rectangle Schmeck given to splashy demonstrations once invited ten fellow architects to a catered dinner and told them he might be late and to start without him In fact he had hidden himself under the dining-room floor and stayed there until the dessert course He emerged grinning unperturbed by the stencil of red-wine droplets across his shirt

Schmeckism snuffed the last lights of modernism, postmodernism and neo-classicism Schmeck could not have known what tragic results his revolution would have for Samuel J Palmerston

"Beauchamp pulled a card out of his wallet, stepped back 25 feet, and shouted at the house at 1185 Leavenworth Street "You have the right to remain silent."

DA Spell that, please

D'Angelo *D* apostrophe-capital-*A-n-g-e-l-o*

DA Occupation?

D'Angelo I head the computer-crimes section of the Baltimore police department White Collar Crime and Fraud Wacko Ha-ha Um

DA Would you please tell the court how you got involved in this investigation?

D'Angelo Sure Homicide needed me to figure out what was on the tapes They were scrambled by the computer—for protection

DA Tapes?

D'Angelo See a house like this has two recorders One is a voice recorder that ah records all exchanges between the house and its owner over the preceding twenty-four hours The second is a computer record of all the mechanical things the house did over the last thirty days Like a black box—those cockpit recorders the airlines use

DA Did you examine these records?

D'Angelo Sure did

DA Starting first with the mechanical tape, would you tell the court what you found?

D'Angelo Well ah everything was normal until July twentieth These Arthurs are ah friendly Like, almost human So the house opened the blinds made the coffee, moved the photoawnings adjusted the AC all perfect like then put on some upbeat classical stuff, *The Four Seasons* by Vivaldi

DA Lieutenant D'Angelo what else did you notice from the record?

D'Angelo Well like I said, the house did everything perfect until about nine PM

DA What happened at nine PM ?

D'Angelo Okay From what I can tell the dead guy ah, the victim turned on his video recorder We found a tape labeled 123 in the machine See Palmerston was a movie freak He liked old flicks Like Bogart, Redford Streep, stuff like that He liked the scary ones too Like 123—we found out it was this creepy movie with a guy named James Arness about the scientists in the Arctic who find this monster frozen in the ice Not bad, either

DA And would you describe this tape please?

D'Angelo It was an AS-1000 New issue

DA AS-1000?

D'Angelo Uh-huh As in audiosensory The *1,000* is just the number of minutes When you plug it in you get audio a picture, and then you also give the house a set of instructions on how to behave during the film You know to make you happy or sad or scared or something It's got ranges You adjust your house to either maximum or minimum effect or even counteretfect Like if you're watching *Frankenstein* but you don't want to be too scared you have the house keep the lights on bright and run a background of white noise so you don t hear anything creak stuff like that So in this case you get your weird noises, some lighting changes, but mostly you get your cold Arctic winds

DA Okay so Palmerston put on tape 123 Then what?

D'Angelo That's when things start going wrong see The dead—ah Jeez the victim being the kind of guy who likes movies set the mood-response system on high So Arthur takes over At first, hey, no problems A little breeze some wind noises Good stuff Then Arthur goes bonkers—

Detense *Objection* Your Honor

Schmeck took his concepts further If a house could sense heat, humidity and barometric change, Schmeck reasoned, surely it could sense mood as well

At the San Francisco City Fair of 1991, he unveiled his first "Senshaus' and demonstrated in a landmark experiment that the house could detect anger in nine out of ten tries For his control group he had 30 people enter the house, where they met an at-

tractive woman who passed out roses The other 30 subjects met a troop of Hare Krishnas, actually six unemployed actors from Los Angeles

So a house could detect moods Could it not, then, alter or influence those moods, based on a series of preprogrammed responses? 'Just as a smoke detector triggers sprays of water,' Schmeck wrote "so too can CARP cool a room or switch on soothing music in response to anger These changes of course must go virtually unnoticed by the homeowner lest they lose their effect by drawing the owner's attention and perhaps worsening his anger much the way a child who has fallen off his bicycle will wait to cry until his mother looks his way.'

Schmeck formed Senshaus Inc , in Palo Alto in 1995. His houses quickly became popular with single parents and people in high-stress jobs. His ads carried the slogan "A man's home is his friend." He named the various models after famous butlers of history and film. It was an Arthur, one of the most advanced Senshaus products ever, that Samuel J Palmerston a mergers-and-acquisitions specialist, acquired in 2015 It had taken Arthur several months to get to know Palmerston and to adjust the house programming to Palmerston's moods routines likes and dislikes

Arthur woke Palmerston at 5 AM each day by warming his bedroom until he couldn't sleep any longer Palmerston's body became so accustomed to the ritual, he first opened his eyes within three minutes of the mercury hitting 79° Fahrenheit Encephalosensors in Palmerston's pillows told Arthur precisely when the first visual images reached Palmerston's brain Seconds later the house made Palmerston's coffee blending caffeinated and decaffeinated in accord with Palmerston's mood. When Palmerston was happy he got mostly decaf To determine his mood, Arthur monitored how long he stayed in the shower, how hot he wanted the water, and whether he sang or whistled Palmerston's coffee was 75 percent decaf on his last day persuasive evidence that he had not committed suicide.

A videotex monitor in Palmerston's closet told him what kind of weather was forecast for the day, information that Palmerston used in picking his clothing and that Arthur used in anticipating the house's energy demands for the day Palmerston also programmed Arthur to watch for any significant news about his clients, the companies he was studying for acquisition, and his stocks The New York Stock Exchange had gone to 24-hour operation on January 1, 2000 Among those in Palmerston's profession there had been suicides and breakdowns, for suddenly there was pressure all day every day Arthur became his financial watchdog and even had authority to buy or sell Palmerston's own stocks once their prices reached preset thresholds

Once Arthur made Palmerston a small fortune while Palmerston slept On the night of December 6 2016, Palmerston's Space Industries stock rocketed 20 points Arthur sold just as the price peaked When Palmerston stood before his closet monitor the next morning, he learned he was richer by $178,560 58

He grew fond of Arthur

Arthur's single story was dug into the hillside at Leavenworth and Park beyond Baltimore's northernmost rim All but Arthur's south-facing wall was covered with earth, and the ground above was planted in grass and boxwood, as were the roofs of the two other houses above an early Jeeves model and a modified Arthur, recalibrated for the single woman who occupied it The owners of each of those houses had an unobstructed view over the green roofground of the house below

These earth houses tended to make one susceptible to pranks One morning Palmerston turned away from the stove and saw a boy hanging upside down in front of his windows Palmerston dropped his plate of eggs

Yet Schmeck's homes had cut suburban burglary rates in half Whenever Palmerston left town Arthur would simulate human presence slamming doors, clattering blinds, darkening rooms, playing tapes of children screaming If Arthur sensed an intruder, he would broadcast the sound of a large dog barking He could also simulate a husband–wife quarrel

The homes proved a boon to the elderly and to the parents of young children When calibrated for old age an Arthur could detect injury and call an ambulance A SIDS Alert option providing protection against sudden infant death syndrome (SIDS) could alert parents the instant their baby stopped breathing

The Childwatch option told parents where their children were in the house and whether they were asleep or awake As one Senshaus brochure crowed: "It's ten o clock, do you know where your children are? Of course you do!"

To power his home Palmerston installed five banks of photovoltaic cells a bargain at 25 cents a watt One rectangular panel formed a visor over Arthur's south face Arthur could raise or lower this panel to better position the cells and at the same time to block the hot summer sun from entering the home Another bank of cells, set in a glittering paisley pattern under very low reflectivity polymer paving, formed the surface of his patio

Irma Darling, the single woman who lived above Palmerston discovered Palmerston's body The neighborhood had talked long and often about how Irma had her own entry code to Palmerston's house she enjoyed the gossip about their little affair On July 20 a moving man came to her house to ask if he could use her phone He said he and his crew were supposed to pack and move Palmerston's furniture to his new address and figured Palmerston hadn't heard their knock or that something must be wrong with the house because it never

responded either Irma nearly tainted She hadn't known Palmerston planned to move

The *Sun's* police reporter caught Irma at a bad moment. The bastard she told him "Coward. Pig."

DA Lieutenant D'Angelo does this mechanical record tell also about conditions within the house at the time of death?

D'Angelo Yeah Cold Like really cold By midnight the temperature in the house was twenty-five degrees Fahrenheit, and Arthur had a wind going at about fifteen knots

DA Are you aware of the official cause of death as previously stated in the court record?

D'Angelo Yessir I am

DA I'm going to read to you now from the testimony of Dr Amos Fletcher the medical examiner "Question Doctor what was the cause of death? Answer Hypothermia—exposure in lay terms What happens is your body temperature sinks so low you die Do you recall this testimony Lieutenant D'Angelo?

D'Angelo Yes Hypothermia

DA Exposure in his own home in July

D'Angelo Yessir

DA Now about the voice tape What did you find there?

D'Angelo Nothing I mean a lot of the same thing Just a song Like the house was singing to itself for twenty-four hours straight

Judge Singing Lieutenant?

D'Angelo Yeah Judge Real soft and sweet like

Judge What was the house singing?

D'Angelo A Christmas song Only he changed the words

Judge Who changed the words?

D'Angelo The house changed the words Like this

I know when you've been sleeping
I know when you're awake
I know when you've been good or bad
So be good for goodness sake!
Oh—

Judge Thank you You have a nice voice

Samuel Palmerston had grown tired of suburban life of Irma and of Arthur Especially Arthur

His work as a mergers-and-acquisitions specialist for Hart Meyer & Rheinbeck of New York kept him home all day in front of his computers He was forty-one single no prospects for Irma was no longer a prospect but a nuisance In September 2018 he applied for entry in Philadelphia Citybelt 3 and a berth in its workcenter The waiting list was a year long

Belt 3 was the newest of the city concentrics cities that from the air looked like dart boards with regular bands of green All this was specifically the result of federal greenbelt legislation passed in the early 1990's to force cities to set aside and preserve belts of undeveloped land or forsake all federal money Some cities like Philadelphia had chosen the belt approach concentric circles of terraced towers between broad belts of forest and grass In the Philadelphia citybelts towers rose in steps from each side of the citybelt and met at the top forming a circular mountain range All housing faced the greenbelts on either side of the citybelt This left a great hollow core within the towers for schools day care centers malls museums restaurants city parks and workcenters

By living in the city Palmerston also would get the right of first refusal on a desk in the La Boheme workcenter This attracted him most Here dozens of professionals—architects lawyers writers moneymen even one painter—worked under one roof, sharing computer memory and peripherals conducting their business then converging for lunch at the La Boheme Canteen or any of the dozens of other cafes on the third and tenth levels

La Boheme encouraged diversity Palmerston wanted that He had started his career at Hart Meyer's headquarters in New York but hated the commute from Long Island Next he tried telecommuting from a "halfway house" an office five minutes from his home and staffed with other Hart Meyer analysts who lived in the area This had worked well But the company wanted him in its Mid-Atlantic region where savings and loans were in old man Meyer's words merging "like rabbits in heat"

Palmerston bought Arthur moved to Baltimore and began working from his home It took a full year to make his first real friends and most of these were computer friends little more than real-time pen pals He enjoyed computer chats the intensity you got from linking minds without the barriers of race sex dress voice People really did communicate in this faceless realm But something was missing

Soon after his move to Baltimore he got caught up in a giant merger battle between two megabanks—one in New York the other in Miami It lasted six months As director of the Hart Meyer merger team he had to be on call 24 hours He spent his weekends sleeping interrupted every few hours by an alert from his squad leaders or from Arthur Each side fought to wear the other out physically

The New York bank won, and Hart Meyer made Palmerston an associate partner But those had been trying months Arthur and he grew very close Arthur always had the warm milk handy At night Arthur switched on Palmerston's favorite *Rain in the Muir Woods* tape and perfumed the air with the scent of moist redwood Mornings Arthur played rousing music But Palmerston felt isolated He was becoming an electronic hermit And Arthur had grown demanding Once in a burst of anger Palmerston shouted at Arthur "Don't you have any friends of your own?"

When the realtor called to tell Palmerston he could move into his new home on July 21 2019 he was elated

"At night the house played Palmerston's favorite tape and scented the air with moist redwood. But Palmerston still felt isolated. He was turning into an electronic hermit."

The night of July 20 Palmerston came home late after a date He punched his entry code into the door terminal, entered, and waited for Arthur's usual greeting No response The door remained locked He punched the number again This time the door opened

Arthur did not offer his usual greeting Instead Arthur said "I took a call for you today from a woman Her name was Anne McAndrews"

Palmerston stopped "Oh?" he said

Arthur was silent Palmerston walked toward the kitchen

"She said she was your realtor Century 22 She left a message" Arthur played a recording of her voice "I'll call with the entry code tomorrow morning"

Palmerston stopped walking He felt his face flush

Arthur said "You could have told me"

"Arthur I didn't want to tell you until I was sure" Palmerston saw the kitchen faucet begin to drip

"When?" Arthur said

"Tomorrow"

The lights dimmed

Palmerston wondered why he didn't feel sadder When he was a child he cried when his parents and he moved from their home in Colorado And that was before anyone had heard of Arthurs The only interaction he had with the old house was when he stuck a paper clip in an electric socket All Palmerston felt now was relief But he was careful to avoid any outward display of joy

"Look" Palmerston said "someone new will come along and you will adapt just as you did with me"

"We had something special"

Palmerston raised an eyebrow

"I am going to die"

Arthur

Palmerston opened the refrigerator then stopped He cocked his head to one side. No question about it. Arthur was singing

Palmerston walked into his living room and asked Arthur for Tape 123 "Maximum Arthur, if you would," he said *"I can at least try to be nice these last few hours."* Palmerston told himself "Once more for old times' sake Arthur" ∞

MURDER

CONTINUED FROM PAGE 46

Samuel J. Palmerston (which the house undoubtedly took more seriously than its victim did) was precipitously informed that the latter was going to move the very next day to his new Philadelphia home. The reaction to this cavalier announcement was immediate—one of Arthur's faucets began to drip, and following a mournful declaration that "we had something special," the house sobbed that it was going to die. Later that night it apparently reacted in the fashion of many rejected lovers over the ages—it destroyed the one who had betrayed its trust and devotion.

When Dr. Tarnower told Jean Harris that he was supplanting her with someone younger, she, like Arthur, felt that a mortal wound had been inflicted by a man she had loved long, passionately, and devotedly. This sense of betrayal must have been so shattering that it caused her to lose all control and to strike back at the source of her sudden and overwhelming misery.

If "hell hath no fury like a woman scorned," a faithful and loving house might well have experienced a similar all-consuming anger at rejection. While Arthur may be guilty of homicide in the general sense, a jury could reasonably find that the emotional shock coldly and deliberately inflicted upon him, without any warning whatsoever by Palmerston, so paralyzed his reason that he could not be found guilty of murder, but only of the lesser man-slaughter charge.

In the last analysis, while all houses may not be homes, even in the twenty-first century those houses that are surely merit the defenses that the realities of a civilized society have deemed reasonable and necessary if justice is to be truly done.

F. LEE BAILEY

As the bewilderment of Detective Beauchamp makes clear, the history of houses being arrested for homicide is nonexistent. But it is the job of criminal-defense lawyers to be resourceful and to extrapolate from earlier precedents when new problems are dropped upon your plate. (A study that has been made of Edgar Allan Poe's "The Fall of the House of Usher" reveals a house that certainly *should* have been prosecuted but due to sloppy detective work was destroyed before it could be tried.)

The prosecution of Arthur must be examined not with respect to the history of the defense of houses but the defense of computers. By searching through the *FlashBase II+* file on computer misconduct (*FlashBase* is a profound evolutionary offshoot of the old, slow *dBase III+*) one finds that charging computers with deliberate misconduct has been contemplated before, but never done. It was considered when a runaway computer almost started a war of annihilation in the 1983 movie *WarGames*; the notion of court-martialing the computer for attempted genocide was abandoned by the Air Force Chief of Staff when it was pointed out that this particular computer couldn't even play a decent game of tic-tac-toe.

Also, in *2001* there was much public hue and cry that the offending computer—Hal—should be brought to book for his selfish and treacherous conduct. Problems of jurisdiction and access to the defendant were mulled over, and the matter was shelved. Nine years later Hal was rehabilitated handily.

Which brings us to the matter of Arthur. The defense should be readily apparent to any barrister who has been fighting the prosecutorial dragons of the twenty-first century. And as in the manner of Hamilton Burger standing slack-jawed after an obvious but clever move by Perry Mason, DA Schwarz will never see it coming.

The deposition of designer Schmeck established that Arthur was put on the market with no conscience module installed, simply because it was not foreseen that Arthur would have the capability to establish dependence on a human friend to the extent that he might react emotionally toward a threatened termination of that friendship. This design shortcoming cannot be laid at Arthur's doorstep because Arthur did not design himself. Therefore, even if one were to assume—as D'Angelo would like us to do—that Arthur deliberately dispatched Palmerston in retaliation for Palmerston's secret and treacherous attempt to divorce him without notice or hearing, Arthur had not the means to restrain such conduct or to know that it was wrong to act in such a fashion. This is best shown by the fact that nowhere in the legal volumes of any country has a computer been shown to manifest a punishable criminal intent.

> *"Spice (they used to be called spouses) who have learned that they are about to be dumped have two reactions. One is, I am going to die. The other is, You are going to die."*

Additionally, the defense can show that in all probability Palmerston died because of his own negligence. A check of Arthur's status board shows that Palmerston had not run his *DeBug Com* program for more than 12 months, when 90 days is considered the maximum safe limit to ensure that a computer such as Arthur, learning new commands on a daily basis, does not react—in confusion, of course—adversely to an ambiguous command.

According to learned opinion from the main defense witness, Dr. Selmon Schwemble from MIT, the evidence indicates the following:

1. Upon confirmation by Palmerston that it was all over between them, Arthur felt sadness (the crying faucet) and depression (the current slump that dimmed the lights). He was nonetheless determined to use all his memory circuits and speed (he had a recently installed turbocharger board) to so please Palmerston that the latter might reconsider his move. That Arthur's depression was severe is evidenced by his response: "I am going to die." Spice (they were called *spouses* years ago) who have just learned that they are about to be dumped have two typical reactions. One is *I am going to die*. The other is *You are going to die*.

2. When Palmerston asked for 123, Arthur knew that his boss was into low thermals; the entire movie unfolds in subzero temperatures. When Palmerston said, "Maximum Arthur, if you would," Arthur's logic circuits began to offer ambivalent responses. What was to be maximized? The gore, the frigid wind, or perhaps the abject terror that no earlier motion picture had matched? (As Arthur knew but perhaps Palmerston did not, the film's promoters claimed to have caused four coronaries and a stroke among viewers.)

3. When Palmerston added to his earlier command, "Once more for old times' sake," Arthur, Palmerston unwittingly caused his own death. The *once more* registered as a common command, while Arthur's disks are devoid of any comprehension of *for old times' sake*. Arthur solved the dilemma of *maximum* relating to 123 by adding in *once more*, and quite properly strove to simulate the film's screen conditions in the house to maximize Palmerston's enthrallment in the story, properly assuming that Palmerston was aware of and had accepted the risks involved. Using *DeBug Com* in timely fashion could have prevented this. Arthur is guilty of nothing and must be acquitted.

Oh, yes. About my fee. As soon as the paperwork is done and he is released, I will take Arthur. And if Arthur were homicidal, I wouldn't want him; would I?

MARVIN MITCHELSON

Out of control is the name of this game. The possibilities for a defense lawyer here are endless.

The first important point: Does Arthur remain a house? If you could convince a judge and jury that Arthur was merely to be treated as a manufactured object—which I doubt—then I think we'd have to try to hang the architect, so to speak.

Berfold Schmeck is the guy who designed all of this. He created—and promised his clients—such total environmental control through all these systems and in-

ventions and appliances that I think he's got to be the person who's responsible. I would argue that he was lulling people into a false sense of security. *Of course* they assume everything is going to work.

It's a little like the space shuttle. Isn't it? We don't, finally, blame the rocket; we blame the people who worked on it. If you're going to put someone in jail you can't reasonably come out against products or projects or even faceless corporations. There comes a point where individuals have responsibilities, and in this case, if there is criminal liability, it would have to be Schmeck's.

Now, I think Arthur is downright human. And if he is to be tried as a living entity, shall we say? then two strategies quickly come to mind.

First, I could argue that until the end Arthur was trying only to please his owner. That was what he had always tried to do. Arthur was an extraordinarily devoted, loving, slavish entity. He did everything he could to make Palmerston happy. The last thing Arthur wanted to do was murder Palmerston or harm anyone for whom he was truly both house and home. The homicide, I would say, was a technical malfunction. It certainly was not infentional. It was just something that got out of control. Lots of controls are involved in a sophisticated piece of work like Arthur. And when you've got so many controls—maybe too many controls—something's likely to go *out* of control. This does raise an interesting question. In an advanced technological society, does everyone who takes advantage of the technology assume the risks? If you can't prove willful neglect on the part of the manufacturer or whomever, I would think so.

This would be a very good case for palimony, by the way—if Palmerston had survived, of course. I mean, look at it. What a relationship these two had! They were so completely a part of each other's lives. They truly functioned as partners. Arthur was Palmerston's financial watchdog. Arthur had the authority to buy or sell Palmerston's stocks, and Arthur had once made Palmerston a small fortune. Certainly Arthur could have recovered the profits he'd made for Palmerston and maybe a lot more than that. A case might even have been made against the estate.

An alternate defense strategy might be to argue that there had been adequate provocation. Palmerston was stretching Arthur to the limit. Palmerston was *so* demanding. He wanted every luxury, every service, every attention. Arthur could handle that, but Palmerston was such a nagger. He was really like a nagging spouse. Gimme, gimme, gimme. He nagged once too often and paid dearly for it.

Finally, if after further consideration none of these approaches seemed to me to be correct, I would definitely try to blame it on the neighbor.

'Any other claim to fame besides having a toxic waste site named after you?'

MELVIN M. BELLI

I would love to try this case! I think that Arthur is worthy of a good defense. I don't think it odd that this house may or may not have killed someone. My own house is very much alive and speaks to me constantly, particularly in the still of the night, when I'm lying in bed.

I'd have to defend the house for first-degree murder—because apparently the house was planning to do this. And the house is going to be seen as an ingrate. That's a real problem. After Palmerston purchases him, fills him with food and furniture and warm, living people, Arthur turns around and murders him. That's how many would see the situation.

I would combat this by trying to create sympathy for the house, arguing that human beings neither understand nor have enough respect for their houses.

Houses are our best friends, but we do not listen to them. What many people think might have been the wind opening doors and moaning is not that at all; it's your house demanding attention. It may be telling you it needs a new coat of paint (just like you need a new suit of clothes). It may be asking for consolation or trying to tell you that you should get more fire extinguishers or whatever for its protection.

You could say Arthur was virtually driven to kill. He might reasonably have feared that he would be abandoned without companionship and without any necessary maintenance. Perhaps he feared being exposed to the elements and, as a matter of poetic justice, subjected his faithless owner to that very fate.

One could also charge that Palmerston 'assumed the risk' by urging Arthur to produce the maximum effect in screening the horror movie for his soon-to-be-former owner. The house was urged on, and now we want to convict him!

Though this case presents obvious difficulties for a defense attorney, I would draw encouragement and inspiration from the example of Bartholomew Chassne. Chassne, an attorney in Autun, France, made his reputation precisely by defending nonhumans. Counselor Chassne successfully took on the defense of such problematic clients as a sow accused of eating her young, rats charged with invading a tavern, and a rooster alleged to have laid an egg by means of devilish sorcery. During the time Chassne defended the rats of Autun, he successfully moved for a continuance—on the trial date—by claiming that the rats' trial was too precipitous and that they should have more time to put their houses in order and make arrangements for leaving their homes guarded when they came to trial. And the rats were given a one-month delay!

If these clients were worthy of fervent representation and if they could be successfully defended against such dastardly charges, then I can see no excuse for failing to take up the cudgel on behalf of tenderhearted Arthur.

BRAHMS

CONTINUED FROM PAGE 58

long as even a handful of us are still alive and kicking.

I am alive, though I don't know why (I now honestly do not recall the exact nature of the experiments I was onboard our craft to conduct). I'm not sure I'm kicking, and I told her so.

She grinned and patted my knee. "Don't worry about it, Flynn. I don't mean you should take up where you left off with Lily Chu." That happened back in training. I didn't even remember it until Beamish said this. "Nobody's capable right now, which is just as well. Besides, the women in this group are not going to be anybody's goddamn brood mares. Science-fiction traditions to the contrary."

"Oh," I said. I think.

She went on to say that the Kondrai have or can borrow the technology to develop children for us in vitro. All we have to do is furnish the raw materials.

I said fine. I had developed another terrible headache. I've been having headaches lately.

After she left, I tried some music. Walter Drake got me *Boris Godunov*, but I can't listen to it. I can't listen to anything with people's voices. I don't know how to tell this to Walter Drake. Don't want to tell her. It's none of her business anyhow.

Entry 10. Chu and Morris are sleeping together. So much for Beamish's theory that nobody is capable. With Myers not up to playing chess yet, I guess Morris had to find something to do.

Chu said to me, "I'm sorry, Michael."

I felt this little, far-off sputtering like anger somewhere deep down, and then it went out. "That's okay," I said. And it is.

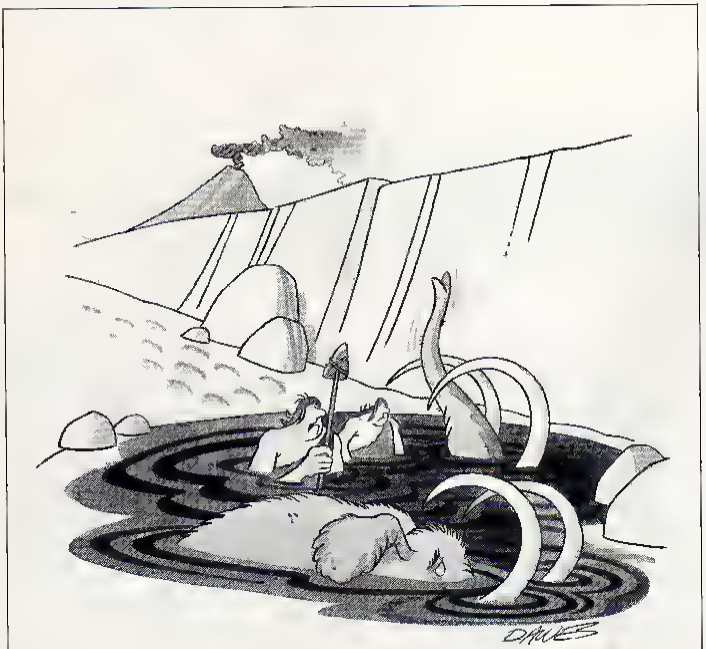
Chandler has been spending all his time in the communications cell of the ship with another lizard, one with a French name that I can't remember. Chandler tells us he's learning a lot about Kondrai life. I tune him out when he talks like this. I never go to the communications cell. The whole thing gives me a headache. Everything gives me a headache except music.

Entry 11. I was sure it would be like landing in some kind of imitation world, a hodgepodge of phony bits and pieces copied from Earth. That's why I wouldn't go out for two K-days after we landed.

Everybody was very understanding. Walter Drake stayed onboard with me.

"We have fixed up a nice hotel where you can all be together," she told me, "like the honored guests that you are."

I finally got off and went with the others when she gave me the music recordings to take with me. She got me a playback machine. I left the Mozart clarinet quintet behind, and she found it and brought it after me. But I won't listen to it. The clarinet sound was made by somebody's living breath.



"I can't wait for the time when we become intelligent enough not to follow the herd into the tar pit."

somebody who's dead now, like all of them. I can't stand to hear that sound.

The hotel was in a suburb of a city, which looked a little like L.A., though not as much as I had expected. Later sometime I should try to describe the city. There's a hilly part, something like San Francisco, by the sea. We asked to go over there instead. They found us a sort of rooming house of painted wood with a basement. Morris and Chu have taken the top floor, though I don't think they sleep together anymore.

Ross has the apartment next door to me. She's got her own problems. She threw up when she first set foot on Kondra. She throws up almost every day, says she can't help it.

There are invitations for us to go meet the locals and participate in this and that, but the lizards do not push. They are so damned considerate and respectful. I don't go anywhere. I stay in my room and listen to music. Handel helps me sleep.

Entry 12. Four and a half K-years have passed. I stopped doing this log because Chandler showed me his. He was keeping a detailed record of what was happening to us, what had happened, what he thought was going to happen. Then Beamish circulated her version, and Dr. Birgit Nilson, the lizard in charge of our mental health, started encouraging us all to contribute what we could to a "living history" project.

I was embarrassed to show anybody my comments. I am not a writer or an artist like Myers has turned out to be. (His pictures are in huge demand here, and he has a whole flock of Kondrai students.) If Chandler and Beamish were writing everything down, why should I waste my time doing the same thing?

Living history of what, for whom?

Also, I didn't like what Chandler wrote about me and Walter Drake. Yes, I slept with her. One of us would have tried it, sooner or later, with one lizard or another. I just happened to be the one who did. I had better reasons than any of the others. Walter Drake had been very kind to me.

I was capable all right (still am). But the thought of going to bed with Lily or Sue Anne made my skin creep, though I couldn't have said why. On the Kondrai ship I used to jerk off and look at the stuff in my hand and wonder what the hell it was doing there. Didn't my body know that my world is gone, my race, my species?

Sex with Walter Drake is different from sex with a woman. That's part of what I like about it. And another thing: Walter Drake doesn't cry in her sleep.

Walter and I did all right. For a couple of years I went traveling alone, at the government's expense—like everything we do here—all over Kondra. Walter was waiting when I got back. So we went to live together, away from the rooming house. The time passed like a story or a dream. Not much sticks in my head now from that period. We listened to a lot of music together. Nothing with flutes or clarinet, though. String music, percussion, piano music,

horns only if they're blended with other sounds—that's what I like. Lots of light stuff. Dukas and Vivaldi and Milhaud.

Anyway, that period is over. After all this time Chu and Morris have committed suicide together. They used a huge old pistol one of them must have smuggled all this way. Morris probably. He always had a macho hang-up.

Beamish goes around saying, "Why? Why?" At first I thought this was the stupidest question I'd ever heard. I was seriously worried that maybe these years on Kondran food and water had addled her mind through some weird allergic reaction.

Then she said, "We're so close, Flynn. Why couldn't they have waited? I wouldn't have let them down."

I keep forgetting about her in vitro project. It's going well, she says. She works very hard with a whole team of Kondrai under Dr. Boleslav Singh, preparing a cultural surround for the babies she's developing. She comes in exhausted from long discussions with Dr. Boleslav Singh and Dr. Birgit Nilson and others about the balance of Earth information and Kondran information to be given to the human babies. Beamish wants to make little visitors out of the babies. She says it's providential that we were found by the Kondrai—a race that has neatly caught and preserved everything transmitted by us about our own culture and our past. So now all that stuff is just waiting to be used, she says, to bridge the gap in our race's history. "The gap"—that's what she calls it. She has a long-range plan of getting a ship for the in vitros to use when they grow up and want to go find a planet they can turn into another Earth. This seems crazy to me. But she is entitled. We all are.

I've moved back into the rooming house. I feel it's my duty now that we're so few. Walter has come with me.

Entry 13. Mozart's piano concertos, especially Alfred Brendel's renditions, all afternoon. I have carried out my mission after all—to answer the question, What does a frozen Earthman eat for breakfast? The answer is music. For lunch? Music. Dinner? Music. This frozen Earthman stays alive on music.

Entry 14. A year and a half together in the rooming house, and Walter Drake and I have split up. Maybe it has nothing to do with being in the rooming house with the other humans. Divorce is becoming very common among young Kondrai. So is something like hair. They used to wear wigs. Now they have developed a means of growing featherlike down on their heads and in their armpits, etc.

When Walter came in with a fine dusting of pale fuzz on her pate, I told her to pack up and get out. She says she understands; she's not bitter. She doesn't understand one goddamned thing.

Entry 15. Beamish's babies, which I never went to see, have died of an infection that whipped through the whole lot of them in three days. The Kondran medical team taking care of them caught it, too, though none of them died. A few are blind from it, perhaps permanently.

Myers took pictures of the little corpses. He is making paintings from his photos. Did I put it in here that swallowing a chess piece did not kill Myers? Maybe it should have, but it seems nothing can kill Myers. He is as tough as rawhide. But he doesn't play chess, not since Morris killed himself. There are Kondrai who play very well, but Myers refuses their invitations. You can say that for him, at least.

He just takes photographs and paints.

I'm not really too sorry about the babies. I don't know which would be worse, seeing them grow up as a little clutch of homeless aliens among the lizards or seeing them adapt and become pseudo-Kondrai. I don't like to think about explaining to them how the world they really belong to blew itself to hell. (Lily Chu is the one who went over the signals the Kondrai salvaged about that and sorted out the sequence of events.

"I took the data the machines recorded while we slept and I junked it. Chu says I did a lot of damage to our equipment in the process. It felt good, or something like it."

That was right before she killed herself.) We slept through the end of our world. Bad enough to do it, worse to have to talk about it. I never talk about it now, not even with the Kondrai. With Dr. Birgit Nilson I discuss food, of course, and health. I find these boring and absurd subjects, though I cooperate out of politeness. I also don't want to get stuck on health problems, like Chandler, who has gone through one hypochondriacal frenzy after another in the past few years.

Beamish says she will try again. Nothing will stop her. She confided to Ross that she thinks the Kondrai deliberately let the babies die, maybe even infected them on purpose. "They don't want us to revive our race," she said to Ross. "They're trying to take our place. Why should they encourage the return of the real thing?"

Ross told me Beamish wants her to help arrange some kind of escape from Kondra. God knows to where. Ross is worried about Beamish. "What," she says, "if she goes off the deep end and knifes some innocent lizard medico? They might lock us all up permanently."

Ross does not want to be locked up. She plays the cello all the time, which used to be a hobby of hers. The lizards were only too pleased to furnish her an instrument. A damn good one, too, she says. What's more, she now has three Kondrai studying with her.

I don't care what she does. I walk around watching the Kondrai behave like us.

I have terrible dreams, still.

Symphonic music doesn't do it for me anymore, not even Sibelius. I can't hear enough of the music itself, there are too many voices. I listen to chamber pieces. There you can hear each sound, every thing that happens between each sound and each other sound near it.

They gave me a free pass to the Library of the Retrieval Project. I spend a lot of time there, listening.

Entry 16. Fourteen K-years later, Beamish eventually did get three viable Earth-style children out of her last lot. Two of them drowned in a freak accident at the beach a week ago. The third one, a girl named Melissa, ran away. They haven't been able to find her.

Our tissue contributions no longer respond, though Beamish keeps trying. She calls the Kondrai "snakefaces" behind their backs.

Her hair is gray. So is mine.

Kondran news is all about the growing tensions between Kondra and the neighbor world it does most of its trading with. I don't know how that used to work in economic terms, but apparently it's begun to break down. I never saw any of the inhabitants of that world, called Chadondal, except in pictures and Kondran TV news reports. Now I guess I never will. I don't care.

Something funny happened with the flu that killed all of Beamish's first babies. It seems to have mutated into something that afflicts the Kondrai the way cancer used to afflict human beings. This disease doesn't respond to the cure human researchers developed once they figured out that our cancer was actually a set of symptoms of an underlying disease. Kondran cancer is something all their own.

They are welcome to it.

Entry 17. I went up into the sandhills to have a look at a few of the Old Kondrai, the ones who never did buy into imitating Earth ways. Most of them don't talk English (they don't even talk much Kondran to each other), but they don't seem to mind if you hang around and watch them awhile.

They live alone or else in very small settlements on a very primitive level, pared down to basics. Your individual Old Kondran will have a small, roundish stone house or even a burrow or cave and will go fetch water every day and cook on a little cell-powered stove or a wood fire. They usually don't even have TV. They walk around looking at things or sit and meditate or dig in their flower gardens or carve things out of the local wood. Once in a while they'll get together for a dance or a sort of mass bask in the sun or to put on plays and skits and so on. These performances can go on

for days. They have a sort of swap economy, which is honored elsewhere when they travel. You sometimes see these pilgrims in the city streets, just wandering around. They never stay long.

Some of the younger Kondrai have begun harking back to this sort of life, trying to create the same conditions in the cities which is ridiculous. These youngsters act as if it's something absolutely basic they have to try to hang on to in the face of an invasion of alien ways. Earth ways.

This is obviously a backlash against the effects of the Retrieval Project. I keep an eye on developments. It's all fascinating and actually creepy. To me the backlash is uncannily reminiscent of those fundamentalist-nationalist movements—Christian American or Middle-Eastern Muslim or whatever—that made life such hell for so many people toward the end of our planet's life. But if you point this resemblance out, the anti-Retrieval Kondrai get furious because, after all, anything Earth-like is what they're reacting against.

I sometimes bring this up in conversation just to get a rise out of them.

If I'm talking to Kondrai who are part of the backlash, they invariably get furious. "No," they say, "we're just trying to turn back to our old, native ways!" They don't recognize this passion itself as something that humans, not Kondrai, were prone to. From what I can gather and observe, fervor, either reactionary or progressive, is something alien to native Kondran culture as it was before they started retrieving our signals. Their life was very quiet and individualized and pretty dull, as a matter of fact.

Sometimes I wish we'd found it like that, instead of the way it had already become by the time we got here. Of course the Old Kondrai never would have sent us an embassy in the first place.

I talk to Dr. Birgit Nilson about all this a lot. We aren't exactly friends, but we communicate pretty well for a man and a lizard.

She says they have simply used human culture to revitalize themselves.

I think about the Old Kondrai I saw poking around, growing the kind of flowers that attract the flying grazers they eat, or just sitting. I like that better. If they were a dying culture they should have just gone ahead and died.

Entry 18: Ross has roped Chandler into her music making. Turns out he played the violin as a kid. They practice a lot in the rooming house. Sometimes Ross plays the piano, too. She's better on the cello. I sit on my porch, looking at the bay, and I listen.

Ross says the Kondrai as a group are fascinated by performance. Certainly they perform being human better and better all the time. They think of Earth's twentieth century as the Golden Age of Human Performance. How would they know? It's all secondhand here, everything.

I've been asked to join a nutritional-study team, heading for Kondra South, where some trouble spots are developing. I have declined. I don't care if they starve or why they starve. I had enough of looking at images of starvation on Earth, where we did it on a terrific scale. What a performance that was!

Also I don't want to leave here because then I wouldn't get to hear Ross and Chandler play. They do sonatas and duets and they experiment, not always very successfully, with adapting music written for other instruments. It's very interesting. Now that Ross is working on playing the piano as well as the cello, their repertoire has been greatly expanded.

They aren't nearly as good as the great musical performers of the Golden Age, of course. But I listen to them anyway whenever I can. There's something about live music. You get a hunger for it.

Entry 19: Myers has gone on a world tour. He is so famous as an artist that he has rivals, and there are rival schools led by artists he himself has trained. He spends all his time with the snakes now, the ones masquerading as artists and critics and aesthetes. He hardly ever stops at the rooming house or comes by here to visit.

Sue Anne Beamish and I have set up house together across the bay from the rooming house. She's needed somebody around her ever since they found the desiccated corpse of little Melissa in the rubbish dump and worked out what had been done to her.

The Kondran authorities say they think some of the Kondrachalikpon (as the anti-Retrieval backlash members call themselves now, meaning 'return to Kondran essence') were responsible. The idea is that these Kondracha meant what they did as a symbolic rejection of everything the Retrieval Project has retrieved and a warning that Kondra will not be turned into an imitation Earth without a fight.

When Dr. Birgit Nilson and I talked about this, I pointed out that the Kondracha, if it was them, didn't get it right. They should have dumped the kid's body on the Center House steps and then called a press conference. Next time they'll do it better, though, being such devoted students of our ways.

"I know that," she said. "What is becoming of us?"

Us meant 'us Kondrai,' of course, not her and me. She likes to think that we Earth guests have a special wisdom that comes from our loss and from a mystical blood connection with the culture that the Kondrai are absorbing. As if I spend my time thinking about that kind of thing. Dr. Birgit Nilson is a romantic.

I don't talk to Sue Anne about Melissa's death. I don't feel it enough, and she would know that. So many died before, what's one more kid's death now? A kid who could never have been human anyway because a human being is born on Earth and raised in a human society, like Sue Anne and me.

"We should have blown their ship up and us with it," she says, "on the way here."

She won't come with me to the rooming

"The tests are conclusive. It's dangerous to drive with a bunch of dummies in the car."

house to listen to Ross and Chandler play They give informal concert evenings now I go even though the audience is ninety-eight percent lizard because by now I know every recording of chamber music in the Retrieval Library down to the last scrape of somebody's chair during a live recital The recordings are too faithful I can just about tolerate the breath intake you hear sometimes when the first violinist cues a phrase It's different with Ross and Chandler Their live music makes the live sounds all right

Concerts are given by Kondran artists all the time but I won't go to those

For one thing I know perfectly well that we don't hear sounds, we human beings not sounds from outside Our inner ear vibrates to the sound from outside and we hear the sound that our own ear creates inside the head in response to that vibration Now how can the Kondran ear be exactly the same as ours? No matter how closely they've learned to mimic the sounds that our musicians produced Kondran ears can't be hearing what human ears do when human music is played A Kondran concert of human music is a farce

Poor Myers He missed the chance to take pictures of Melissa's dead body so he could make paintings of it later

Entry 20 They are saying that the reason there's so much crime and violence now on Kondra isn't because of the population explosion at all Some snake who calls himself Swami Nanda has worked out how the demographic growth is only a sign of the underlying situation

According to him Kondra made an astral agreement to take in not only us living human survivors but the souls of all the dead of Earth Earth souls on the astral plane seeing that there were soon going to be no more human bodies on Earth to get born into sent out a call for new bodies and a new world to inhabit The Kondran souls on the astral plane having pretty much finished their work on the material world of Kondra agreed to let human souls take over the physical plant here as it were Now the younger generation is all Earth souls reborn as Kondrai on this planet and they're re-creating conditions familiar to them from Earth

I have sent this Swami four furious letters He answered the last one very politely and at great length explaining it all very clearly with the words he has stolen for his stolen metaphysical concepts

Oh yes Another dozen K years have passed I might as well just say *years* Kondran years are only a few days off our own and Chandler has stopped keeping his Earth time calendar since he's gotten so deep into music

Chandler is now doing some composing, Ross tells me

Ross rebukes me when I call the Kondrai snakes, talking to me as gently and reasonably as the Kondrai themselves always talk to us That makes me sick which is pretty funny when I recall how she used

to vomit every day when we first came here. So she can stop telling me how to talk and warning me that it's no good to be a recluse. No good for what? And what would be better?

Nobody ever taught me to play any instrument. My parents said I had no talent, and they were right. I'm a listener, so I listen. I'm doing my job. I wouldn't go to the rooming house and talk to Ross at all except for the music. They are getting really good. It's amazing. Once in a while I spend a week at the Retrieval Library listening to the really great performances that are recorded there, to make sure my taste hasn't become degraded.

It hasn't. My two crew mates are converting themselves, by some miracle of dedication, into fine performers.

Last night I had to walk out in the middle of a Beethoven sonata to be alone.

Entry 21. Sue Anne had a stroke last week. She is paralyzed down her left side. I am staying with her almost constantly because I know she can't stand having the snakes around her anymore.

She blames me. I know for having cooperated with them. We all spent hours and hours with their researchers, filling out their information about our dead planet. How could we have refused? In the face of their courtesy and considering how worried we all were about forgetting Earth ourselves, how could we? Besides, we really had nothing else to do.

She blames me anyhow, but I don't mind.

A wave of self-immolation is going on among young Kondrai. They find themselves an audience and set themselves afire, and the watching Kondrai generally stand there as if hypnotized by the flames and do nothing.

Dr. Birgit Nilson told me, "Your entire population died out, many of them burnt up in an instant. This created much karma, and those who are responsible must be allowed to pay."

"You're a Nandist then," I said. "Swami Nanda and his reincarnation crap."

"I see no other explanation," she said.

"It all makes sense to you?" I said.

"Yes." She stroked her cheek with her orange-polished talons. "It's a loan. We have lent our beautiful material world and our species' bodies in exchange for your energetic souls and your rich, passionate culture."

They are the crazy ones, not us.

Entry 22. Some wild-eyed young snake with his top feathers dyed blue took a shot at the swami this morning with an old-fashioned thorn gun.

They caught him. We watched on the news. The would-be assassin sneers at the camera like a real Earth punk. Sue Anne glares back and snorts derisively.

Entry 23. Dreamed of my mother at her piano, but her hands were Kondran hands. The fingers were too long and the nails were set like claws, and her skin was covered in minute, grayish scales.

I think she was playing Chopin.

Entry 24. Sometimes I wish I were a writer, to do all this justice. I might have some function as a survivor.

Look at Sue Anne. Except for some terrible luck, she would have created out of us a new posterity.

Myers is doing prints these days, but not on Earth themes anymore, though the Kondrai beg him to concentrate on what's "native" to him. He says his memory of Earth is no longer trustworthy, and besides, images of Kondra are native to the eyes of reborn Earth souls now. He accepts Nandism openly and goes around doing Kondran landscapes and portraits and so on. Well, nobody will have to miss any of that in my account then. They can always look at Myers's pictures.

Walter Drake died last winter of Kondran cancer. I went to the funeral. For the first time I wore makeup.

Myers, the arrogant son of a bitch, condescended to share a secret with me. He uses this face paint, plus a close haircut or a feathered cap, to go out incognito among the snakes so he can observe them undisturbed. Age has smoothed his features and made him thin, like most Kondrai, and he's been getting away with it for years. Well, good for him. Look at what *they're* trying to get away with along those lines!

> *"When she came in with a fine dusting of pale fuzz on her pate, I told her to pack and get out. She says she understands, she's not bitter. But she does not understand a thing."*

Being disguised has its advantages. I hadn't realized the pressure of being stared at all the time in public until I moved around without it.

They said, 'Ashes to ashes and dust to dust," and I got dizzy and had to sit down on a bench.

Entry 25. Four more years. My heart still checks out. Dr. Birgit Nilson tells me. I put on makeup and hang out in the bars, watching TV with the Kondrai, but not too often. Sometimes they make me so damn nervous, even after so long here, I forget what they are and what I am. I forget myself. I get scared that I'm turning senile.

When I get home Sue Anne gives me this cynical look, and my perspective is restored. I play copy-tapes of Dvořák for her. Also Schubert. She likes the French, though. I find them superficial.

To hear Brahms and Beethoven and Mozart, I go to the rooming house. I go whenever Ross and Chandler play. While the music sounds, the constant crying inside me gets so big and so painful and beautiful that I can't contain it. So it moves outside me for a while, and I feel rested and changed. This is only an illusion, but wonderful.

Entry 26. Poor Myers got caught in a religious riot on the other side of the world. He was beaten to death by a Kondracha mob. I guess his makeup job was careless. Dr. Birgit Nilson, much aged and using a cane, came to make a personal apology, which I accepted for old times' sake.

"We caught two of them," she said, "the ringleaders of the Kondracha group that killed your poor Mr. Myers."

"Kondrachalations," I said. Couldn't help myself.

Dr. Birgit looked at me. "Forgive me," she said. "I shouldn't have come."

When I told Sue Anne about this, she slapped my face. She hasn't much strength even in her good arm these days. But I resented being hit and asked her why she did it.

"Because you were smiling, Michael."

"You can't cry all the time," I said.

"No," she said. "I wish we could."

Dr. Birgit Nilson says that Kondrai are now composing music in classical, popular and "primitive" styles, all modeled on Earth music. I have not heard any of this new music. I do not want to.

Entry 27. At least Sue Anne didn't live to see this. They are now grafting lobes onto their ugly ear holes.

No, that's not the real news. The real news is about Kondra South, where a splinter group of Kondracha extremists set up a sort of purist, Ur-Kondran state some years ago. They use only their version of Old Kondran farming methods, which is apparently not an accurate version. Their topsoil has been rapidly washing away in the summer floods.

Now they are killing newborns down there to have fewer mouths to feed. The pretext is that these newborns look like humans and are part of the great taint that everything Earthish represents to the pure. The official Kondrachalikipon line is that they are feeding themselves just fine, thank you. The truth seems to be mass starvation and infanticide.

After Sue Anne died I moved back into the rooming house. I have a whole floor to myself and scarcely ever go out. I watch Kondran TV a lot, which is how I keep track of their politics and so on. I keep looking for false notes that would reveal to any intelligent observer the hollowness of their performance of humanity. There isn't much except for my gut reaction. The Kondran claim to have preserved human culture by making it their own would be very convincing to anyone who didn't know better. Even their game shows look familiar. Young Kondrai go mad for music videos and deafening concerts by their own groups like the Bear Minimum and Dead Boring. I stare

and stare at the screen, looking for slip-ups. I am not sure that I would recognize one now if I saw one.

I hate the lizards. I miss her. I hate them.

Entry 28. Ross and Chandler have done the unthinkable. At last night's musicale they sprang one hell of a surprise.

They have trained two young Kondrani to a degree that satisfies them (particularly Gillokan Chukchonturanfis, who plays both violin and viola).

Now the four of them are planning to go out and perform in public together as the Retrieval String Quartet.

The Lost Earth String Quartet. I could stomach maybe. Or the Ghost String Quartet, or the Remnant String Quartet. But then, of course, how could Kondran musicians be in it?

I walked out in protest.

Ross says I am being unreasonable and cutting off my nose to spite my face, since as a quartet they have so much more music they can play. To hell with Ross. The traitress Chandler, too.

Entry 29. I cut my hair and put on my makeup and managed to get myself one ticket, not as Michael Flynn the Earthman but as a nameless Kondran. The debut concert of the Retrieval String Quartet is the event of the year in the city, a symbol of the passing of the torch of human culture, they say. An outrage, the Kondracha scream. I keep my thoughts to myself and lay my plans.

Lizards are pouring into the city for the event. Two bombings have already occurred; credit for them claimed by the Kondrachalikipon, of course.

As long as the scaly bastards don't blow me up before I do my job.

The gun is in my pocket, Morriss's gun that I took after he and Chu killed themselves. I was a good shot once. My seat is close to the stage and on the aisle, leaving my right hand free. I have had too much bitterness in my life. I will not be mocked and betrayed in the one place where I find some comfort.

Entry 30. Now I know who I wrote all this for, Dear Dr. Herbert Akondritchilka. You do not know me. Until a little while ago I didn't know you either. I am the man who sat next to you in Carnegie Hall last night. Your Kondran version of Carnegie Hall that is constructed from TV pictures all sparkling in crystal and cream and red velvet—handsomer than the real place was, but in my judgment slightly inferior acoustically.

You didn't notice me, Doctor, because of my makeup. I noticed you. All evening I noticed everything, starting with the police and the Kondracha demonstration outside the hall. But you I noticed in particular. You managed to wreck my concentration during the last piece of the music I expected to hear in my life.

It was the Haydn String Quartet Number One in G, Opus 77. I sat trying to hear the effect of having two Kondrani among the players, but your damned fidgeting distracted me.

Just my luck. I thought. *A Kondran who came for a historic event, though he has no feeling for classical Earth music at all.*

All through the Haydn you sat locked tight except for these tiny, spasmodic movements of your head, arms, and hands. It was a great relief to me when the music ended and you joined the crashing applause. I was so busy glaring at you that I missed seeing the musicians leave the stage.

I watched you all through the interval. I needed something to fix my attention on while I waited. The second piece was to be one of my favorites, the Brahms String Quartet Number Two in A minor, Opus 51. I had chosen the opening of that quartet as my signal. I meant to see to it that the Brahms would never be played by the traitors Ross and Chandler and the two snakes they had trained. In fact, no one was ever going to hear Ross and Chandler play anything again.

What would happen to me afterward I didn't know or care (though it crossed my mind in a farcical moment that I might be rescued as a hero by the Kondracha).

I wondered if you would be a problem—an effective interference, once the first note of the Brahms piece sounded and I began to make my move. I thought not.

You were small and thin, Dr. Akondritchilka, neatly dressed in your fake blazer with the fake gold buttons, a thick thatch of white top feathers, a round face for a lizard, and glasses that made your eyes enormous. I wondered if you had ruined your eyesight studying facsimile texts taken from Earth transmissions. I could see by the grayed-off skin color that you were elderly, like so many in this audience, though probably not as old as I am.

You fell into conversation with the Kondran on your left. I realized from what I could overhear that the two of you had met for the first time earlier that same day. She was now exploring the contact. Oh, she said, "you're a doctor?"

Retired," you said.

You must meet Mischa Two Hawks, she said, "my escort tonight. He's a retired doctor, too."

The seat to her left was empty. Retired doctor Mischa Two Hawks may have withdrawn to the men's room or gone out in the lobby for a smoke.

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You must understand my mind made automatic translations as fast as the thought finished. Imitation retired imitation doctor Mischa S. (for Stolen names) Two Hawks was in the imitation men's room or smoking an imitation cigarette.

His companion, an imitation woman in a green imitation wool dress, wore a white wig with a blue-rinse tint. God, how Beamish used to rage over the tendency of Kondran females to choose the most traditional women's styles as models! Beamish would have been proud of my work tonight, I thought.

Green Wool Dress, whose name I had not caught, said to you, "The lady with you this afternoon at the gallery—is she your wife? And where is she tonight?"

You shook your head, and your glasses flashed. It pleases me that the nictitating membrane prevents you snakes from wearing contact lenses.

"We used to go to every concert in the city together," you said. "We both love good music, and there is no replacement for hearing it live. But she's been losing her hearing. She doesn't go anymore, it's too painful for her."

"What a pity," Green Wool Dress said. "To miss such a great event! Wasn't the first violinist wonderful just now? And so young, too. It was amazing to hear him."

Damned right it was. Chandler had literally played second fiddle to his own student, Chukchonturanfis. For that alone I could have killed my old crew mate.

I shut my eyes and thought about the gun in my pocket. It was a heavy goddamned thing. I thought about the danger of getting it caught in the cloth as I pulled it out, of missing my aim, of my elderly self being jumped by you two elderly aliens before I could complete my job. I thought of Chandler and Ross, no spring chickens themselves anymore, soon to die and leave me alone among you. The whole thing was a sort of doddering comedy.

Another Kondran, heavyset for a lizard and bald, worked his way along the row of seats. He hovered next to Green Wool Dress, clearly wanting to sit down. She wouldn't let him until she had made introductions. This was, of course, retired doctor Mischa Two Hawks.

"Akonditichilka," you said with a little bow. "Herbert." And the two of you shook hands across Green Wool Dress. All three of you settled back to chat.

Suddenly I heard your voices as music. You, Doctor, were the first violin, with your clear, light tenor. Dr. Two Hawks's lower register made a reasonable cello. Green Wool Dress, who scarcely spoke, was second violin, of course, noodling busily along among her own thoughts. And I was the viola, hidden and dark.

If this didn't stop I knew I would use the gun right now, on you and then on myself. I listened to the words you were saying instead of your voices. I grabbed onto the words to keep control.

"A beautiful piece, the Haydn," you were saying. "I have played it. Oh, not like these musicians, of course. But I used to belong to an amateur chamber group." (How like you thieving snakes, to mimic our own medical doctors' affinity for music making as a hobby!) You went on to explain how it was that you no longer played. Some slow, crippling Kondran bone disease. Of course—your lizard claws were never meant to handle a bow and strings. What was your instrument? I missed that. You said you had not played for six or seven years now. No wonder you had twitched all through the Haydn, remembering.

Some snake in a velvet suit pushed past, managing to step on both my feet. We traded insincere apologies, and he went on to trample past you and your companions. They were all hurrying back in now. My moment was coming. The row was fully occupied, so I sat down and pretended to skim the program notes for the next piece.

On you went, in that clear, distantly regretful tone. I couldn't stop hearing. "It's been a terrible season for me," you said. "My only grandchild died last month. He was fifteen."

"While
the music sounds, the crying inside me
gets so big, so painful, and so beautiful that
I can't contain it. So it moves outside me,
and for a while I feel changed."

Your voice was not music. It was just a voice, taking a tone I remembered from when I and my crew mates first began to be able to say to each other, "Well, it's all gone blown up—mankind and womankind and whalekind and everykind smashed to smithereens while we were sleeping." It's how you sound instead of screaming. You have no more actual screaming left in your throat, but you can't stop talking about what is making you scream, because the screaming of your spirit is going on and on.

My eyes locked on the page in front of me. Had you really spoken this way to two strangers, at a concert? The other two were making sounds of shock and sympathy.

"Cancer," you said, though of course you meant not our kind of cancer but Kondran cancer, and of course even if you were screaming inside it wasn't the same as the spirit of a human being screaming that way.

You leaned forward in your seat to talk across Green Wool Dress to Dr. Two Hawks. "It was terrible," you said. "It started in his right leg. None of the therapy even slowed it down. They did three operations."

I sneaked a look at you to see what kind of expression you wore on your imitation human face while you recited your afflictions. But you were leaning outward to address your fellow doctor, and the back of your narrow lizard shoulders was turned toward me.

Between you two, Green Wool Dress sat with a blank social smile, completely withdrawn into herself. I tried to follow what you were saying, but you got into technical terms, one doctor to another.

The musicians were tuning up their instruments backstage. The gun felt like a battleship in my pocket. Under the dimming lights I could make out the face of Dr. Two Hawks, sympathetic and earnest. Amazing, I thought, how they've learned to produce the effect of expressions like our own with their alien musculature and their alien skin.

"But it's better now than it was at first," Dr. Two Hawks protested. (I thought of Beamish's babies and the death of Walter Drake.) "I can remember when there was nothing to do but cut and cut, and even then—there was a young patient I remember, we removed the entire hip—oh, we were desperate. Dreadful things were done. It's better now."

All around, oblivious, members of the audience settled expectantly into their seats, whispering to each other, rustling program pages. Apparently I was your only involuntary eavesdropper, and soon that ordeal would be over.

The audience quieted, and here they came. Ross first, then Chandler (the Kondran players didn't matter). Ross first. You wouldn't see the blood on her red dress. No one would understand exactly what was happening, and that would give me time to get Chandler, too. I needed my concentration. My moment was here.

On you went, inexorably, in your quiet, melancholy tone. "As a last resort they castrated him. He lost most of his skin at the end, and he was too weak to sip fluids through a tube. I think now it was all a mistake. We should never have fought so hard. We should have let him die at the start."

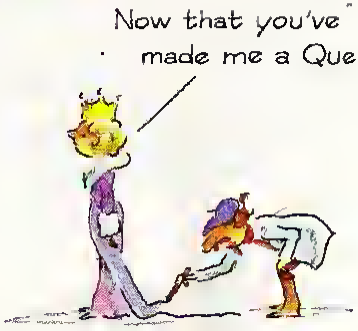
"But we can't just give up!" cried Dr. Two Hawks over the applause for the returning musicians. "We must do *something*!"

And you sighed. Dr. Akonditichilka. "Aaah," you said softly, a long curve of sounded breath in the silence before the players began. You leaned there an instant longer, looking across at him.

Then you said gently (and how clearly your voice still sounds in my mind)—each word a steep, sweet fall in pitch from the one before—"Let's listen to Brahms."

And you sat back slowly in your seat as the first notes rippled into the hall. After a little I managed to uncramp my fingers from around the gun and take my empty hand out of my pocket. We sat there together in the dimness, our eyes stinging with tears past shedding, and we listened. ∞

The Artist



GAMES

CONTINUED FROM PAGE 125

spokesperson for Ventura Associates, Inc., the marketing firm that handled the responses. "From our experience, and I would venture to say for the entire industry, the number of entries received for the *Omni* Treasure Hunt represents an all-time high in response-circulation ratios."

The solutions to the contest can be found on the following page numbers: 25, 5, 48, 79, 107 or 66 (image found on both pages), 47, 73, 40, 21, 93, 63 or 0 (because the image was inverted, credit was given for more than one answer), and 114.

Congratulations to the 26 prizewinners:

Eleanor Kallmbah, Pacific, MO
Audi 4000CS Quattro

Cynthia Conner, Galveston, TX
His and hers Flemington furs

Kathleen Lynch, Duxbury, MA
NAD USA Inc. entertainment center and oak unit

Rudolfo Saldana, Houston
Baume & Mercier watch

Vera Illing, San Francisco
Nikon camera system

Margaret Jagoe-Ebert, Van Nuys, CA
Pan Am trip to Rio de Janeiro

Robert Brown, Arcanum, OH
Apple IIc computer and software

Mattie Akey, Spooner, WI
Orion Pictures movie screening

Franklin Gilkey, Bainbridge Island, WA
Mastervoice Butler in a Box alarm

Paul Becker, Holden, MA
Recoton audio and video products accessories system

Jacqueline LeBeau, Duluth
Windjammer/Barefoot Caribbean cruise

Shirley Rae Burke, Tucson, AZ
Black Widow satellite TV system

Marsha Vollenweider, Pontiac, MI
Canon PC-14 copier

George Crawford, Greenbelt, MD
Liquor, Carillon Importers

Christine Gallie, Forest Heights, MD
Seagram's wine

Wayne T. Blazek, Littleton, CO
Halleyscope telescope

Lanae Dahl, Balboa, CA
Halleyscope

Barbara Fein, Miami
Halleyscope

Cheryl Gilbert, Harrisburg, PA
Halleyscope

Betty Lewis, Englewood, FL
Halleyscope

Keith Burt, Tallahassee, FL
Micro Eye vector radar detector

Kay Godlewski, Huntersville, NC
Micro Eye

Anita Gogerty, Norwalk, IA
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HYCAD

CONTINUED FROM PAGE 78

was the only hard tough one in the lot He's the only guy that held that first administration together The rest of those plodders produced a wreck within weeks

Omni Let's talk about the state of the economy We've got low oil prices low mortgages and a low inflation rate the stock market and employment are soaring Yet you continue to indict Reaganomics to insist we're sitting on a time bomb?

Stockman All of what you're saying is yesterday's news It represents the tail end of the disinflation cycle But basically all the success claimed for Reaganomics has almost nothing to do with that original fiscal plan including the tax cut It has to do with one tough monetary policy that purged roaring inflation When I talk about the economy I'm talking about the future and suggesting that we've built into the economy some pervasive distortions as a consequence of financing huge deficits We can't live with the one-hundred-fifty-billion-dollar trade imbalance and the country is reacting enormously The only answer is to depreciate the dollar which is exactly what's happening The dollar is plunging in the currency markets and if you permit it to go far enough in order to work down the trade imbalance it will generate a renewed inflationary spiral

Omni And how is that going to reduce the Japanese automakers twenty-five percent share say of the domestic car market?

Stockman If the dollar keeps depreciating the Japanese have to raise their prices on cars and everything else It's the opposite side of the coin from what's happened in the previous three years Then the dollar exchange rate went way up and caused import prices to fall which suppressed domestic prices and brought inflation to a screeching halt Now why do we have these enormous aberrant swings in the exchange rate? Because in 83 84 and '85 there was no way to finance this huge deficit except by importing foreign capital But every time a yen was changed into a dollar or a D-mark to purchase U S bonds stocks and treasury securities it forced the exchange rate up The demand for dollars rose everything else fell We haven't had a free lunch here so much as a disturbance in the exchange rates with pervasive consequences

Omni Are these economic processes really so mechanical? Isn't it possible that no one can predict what's going to happen?

Stockman I agree no one can In a four trillion-dollar economy there are mysteries that nobody can capture because the situation's constantly changing But you start with some basic principles Something that's two hundred billion dollars big and represents borrowing has to be financed by somebody and there is a consequence to financing that two hundred billion dollars which impacts on something else In the short run we've apparently gotten away with it by importing a lot of capital but we're going to have to pay debt service on that capital and this makes us a debtor nation for the first time in seventy years We've suffered a huge decline in the competitiveness of the U S economy which is partly why you have a depression in the agriculture belt why Silicon Valley went on its rear end last year why the domestic market is flooded with imports

If you're going to spend all this money the equitable way is to raise taxes If you finance it through borrowing it's going to work through this black box of the economy in ways that not one out of a thousand people can understand Instead of being equitable public and debated as to who bears the price it's random hidden and invisible and willy nilly it comes back and hits somebody up the side of the head A lot of people who had built nice little family machine-tool businesses over the past twenty-five years are now out of business—they're distraught and maybe jumping out the window

"There are a lot of people who had built up nice little family machine-tool businesses over the years who are now out of business. They're distraught, maybe jumping out of windows."

Omni Raising taxes is the only option left?

Stockman You can cut spending too but I've concluded that the political sentiment against big spending cuts makes that impossible The American public would tolerate a modest tax increase

There's a cost to somebody no matter how you finance it okay? Current taxes don't meet our needs and if the Treasury issues one hundred fifty billion dollars of new debt it flows through the system and somebody gets hurt maybe a farmer If you finance that with taxes you can have legitimate debate in the halls of Congress as to where you lay that burden whether by income class or across the board putting more at the top more at the middle wherever If you want to exempt the poor fine I'm not arguing against that I'm just saying that the most important question is getting your house in order

Omni What does all this portend for the future? Your scenario isn't encouraging

Stockman It portends over the long run say to 2000 fiscal excesses that are chronic inflationary and greater than any we've ever had before—business-cycle fluctuations high dollars low dollars inflationary spurts deflationary corrections

Omni Another Great Depression?

Stockman I don't think so because the kind of depression we had in the Thirties was an aberration I don't see that bleak a future because the problem is correctable What I'm pessimistic about is this administration principally because of its irresponsible rigidity on the question of taxation There'll be an election in 88 though and we'll eventually get the deficit under control probably within five years It's not doomsday but if people don't get their heads out of the sand we're going to have some farming economic consequences That's why Jim Baker has been talking down the dollar ever since last September It's a clear response to domestic political pressure We're moving toward an inflationary form of financing the deficit and we're going to get inflation started back up again probably by this fall It's not going to be ten percent but we'll be back in the four or five percent range very quickly

Omni What is this going to mean to the average American?

Stockman Inflation erodes savings undermines fixed-income investments If it doesn't get too far out of hand it's tolerable but once you get on a rising-inflation path all the biases in the system dictate that if you try to stop it you may trigger a recession That's exactly what happened in the late Seventies The inflation rate in mid-76 was four percent and everybody said Well we've gotta keep the economy growing so that we'll have easy money for a while Within thirty-six months we had twelve percent to fourteen percent inflation rates which just wreaked havoc

Omni How about the issue of smaller rather than bigger government? By 2000 do you foresee total deregulation a continuation of what's already happened with the airline industry?

Stockman Yes Regulating specific economic markets has proven to be a failure whether it's financial institutions trucking and transportation telecommunications or airlines On the other side what I call social regulations—environmental health and safety—will become bigger tighter and more costly because people are afraid of cancers and toxins Reagan hasn't changed anything in terms of clean air yet for my money we've got overkill pure and simple You can't protect the weakest asthmatic every hour of the day every square inch of the country Our regulatory policies lean in that direction because they're dominated by environmental zealots

Omni The two-hour workweek?

Stockman I'd have a hard time predicting that except to say that if you look at the measured workweek it hasn't declined very much in forty years

Omni Despite robotization computerization electronics?

Stockman There's a gentle trend toward less work time as the society becomes

more affluent and technologically advanced, but I also think there's a great differentiation off the mean. Some people are ambitious. They'll continue to work eighty or ninety hours a week, and I don't think that will ever change.

Omni: Hard currency, free markets, a leeriness of debt, all these point toward an underlying adherence to the old-fashioned virtue of hard work. With our new affluence, aren't you concerned that the nation may be getting a little soft?

Stockman: We haven't changed much in the last twenty-five years, and I don't see anything seriously impacting on the national character between now and the year 2000. Economically, man is better off. Whether spiritually man is better off, I don't know, because I'm kind of an agnostic. But the backbone of this society is working and producing and raising the standard of living, and I think that, despite the twists and turns, is what's dominant. The kids I see coming into Salomon Brothers or out of business school aren't any less hardworking, ambitious or financially responsible than their counterparts forty years ago.

Omni: Returning to the future, will personal taxes be going up or down?

Stockman: Income taxes aren't going up, but I think we're going to end up with some kind of consumption tax, like the value-added tax. This is the logical route if we're to have money to fund government.

Omni: Personal-income tax?

Stockman: No increase, because the public won't stand for it. Also, heavy forced income redistribution through the tax system is counterproductive; you've got to let people keep a high share of the rewards, because only then do you get creativity, innovation, entrepreneurial activity and output, which makes everybody better off. I don't profess to know where all the circuits are leading, but I think we've rediscovered the role of the capitalist and entrepreneur, and we're not about to relapse into policies that discourage or penalize them.

Omni: Are we moving toward a two-class system, the rich and the poor, as so many sociologists have predicted?

Stockman: No, we've got a very small underclass of dependent people who are creatures of the welfare system, and almost everybody else is the middle class, so I'm not sure the middle class is shrinking at all. New York, which happens to be the repository of a large share of the underclass of this country, is somewhat unique. It's a sad state of affairs. Everybody decries the welfare system, but nobody can agree on a solution to improve it.

Omni: In what fields do you see the greatest money being made?

Stockman: Well, I wouldn't tell someone: Go study to be a steelmaker. Given the nature of things, it'll be in the high technology areas, ranging from biomedicine to financial instruments. Geographically, over the last fifteen or twenty years there's been diffusion out of the older metropolitan centers. I see no reason why that trend won't continue. Cities have become less livable. People would rather live in Denver than in Chicago, so there'll be a lot more Denvers around, and not necessarily out West. It could be in New Hampshire, many places.

Unions will become a relic of the past. They try to defy the laws of economics and have already priced themselves out of business—the textile workers, steelworkers, autoworkers, all of them. We live in a global market, and when unions try to impose a higher-than-market wage they cause production to shift to places like Mexico, Singapore and South Korea. There are half as many American steelworkers today as there were seven years ago. With the teamsters, finally people said enough is enough, and we deregulated trucking. The marketplace sets values—the value of capital, labor, *any* economic input—and unless you have government-enforced monopoly distortion, the market prevails.

Omni: Do these same forces necessarily spell doom for small businessmen?

"By the year 2000 I don't think we're going to be too far down the road toward the commercial exploitation of space. In one hundred years, though, we may be way, way down that road."

Stockman: The small businessman may have a hard time surviving, but new businesses will be generated in the hundreds of thousands every year as new high-profit areas emerge. The economy itself is in a constant process of creation and destruction. If you let it work, everybody will be better off. If you try to thwart it, arrest it, interrupt it, you end up failing in the long run, and meanwhile you pay a heavy cost.

Omni: By the year 2000 will there be greater or lesser economic interdependence among nations?

Stockman: Much greater, and I see the United States as strong, but not as dominant as in the past. This will affect our self-image, but face it: the people coming out of the paddies into factories are a lot hungrier than we are, which is the key to Japan's extraordinary success, as well as Korea's, Hong Kong's and Singapore's. Affluence has its limits. When you reach a certain living standard, another dollar isn't worth as much as, say, another hour of fishing, skeet shooting, whatever. There's nothing wrong with this so long as you don't count on more welfare benefits to have both. The raw energy and burst of economic expansion are behind us. We're going to see a slower pace of economic growth because we have other items on our collective agenda.

Omni: What about the future status of Western European countries?

Stockman: There's an economic dynamism in Western Europe—a rebirth. We've come out of an era when welfare-state expansion has been tried, pushed to the limits, and now people are going another route. Margaret Thatcher is no accident. She's said enough is enough and has tried to roll back the tide. Germany is slowly doing the same thing, and even Sweden may follow suit.

If reasonably prudent policies are adopted by the major Western powers, Third World economic growth is highly probable. Certain countries carry a heavy debt burden, but one way or another the Western powers will find ways to accommodate that debt. Again, no doomsday, as some have predicted.

Omni: The Soviets in the year 2000?

Stockman: The problem is the inherent contradiction of state socialism and how long that inherent contradiction is viable. Over the next fifteen years the problems of a totalitarian society will fester and grow. The Soviet system isn't going to collapse, nor is it going to change very much. It's a bureaucratically rigid, stagnant system, entirely inward looking. Its ruble is rubble. They get marginal advantages out of trading in the world economy, but they don't have much to trade. On the other hand, I don't buy this theory that the Soviet Union is in an advanced state of decay. It works, but barely.

Omni: What is the worst scenario for the year 2000, short of a nuclear exchange?

Stockman: Exceedingly imprudent national economic management by the major Western powers that leads to trade wars, vast currency- and capital-market instabilities, beggar-thy-neighbor policies. Instead of recognizing the interdependence of economies, we could see a closing off of economies in retaliatory steps, like what happened in the Thirties when every country cut its currency loose from the international system, closed its ports to foreign trade through tariffs, and so forth.

Everybody benefits from trade and economic integration, so if you begin to erect barriers, it slows down the rate of growth, perhaps drastically. Free markets remember; don't stop at the border. We get mad at the Japanese and put a quota on their telecommunications equipment, so they retaliate by not buying our wheat. The process is already beginning, and while it's not out of hand, it's going to take wise leadership to arrest it.

Omni: To what extent does space offer economic opportunities?

Stockman: Only marginally. By 2000 I don't think we'll be too far down the road toward the commercial exploitation of space. But in one hundred years we may be way, way down that road. ◻◻

PHENOMENA

For some classes of animals the extinct outnumber the living. Cephalopoda, for instance, the class of marine mollusks that include the squid and the octopus, boasted many more species during the Paleozoic and Mesozoic eras than it does now. Then primitive forms of the chambered nautilus called ammonites (the fossils shaped like rams' horns, at left) led sluggish lives in the depths of the oceans. Over time, however, cephalopods evolved more variation in their life-style. Today many still move slowly on the ocean floor; others have adopted more vigorous lives, scuttling through the water close to the surface. Still another piece of an ancient cephalopod, a "stiffener" (the pen-shaped object) from an extinct squid of the genus *Belemnites*, is fossilized in this stone slab. Photographer Chip Clark captured this image using a Canon F1 camera, a 50mm macrolens, and Kodachrome 25 film.**DO**

BOOKS

CONTINUED FROM PAGE 24

struggle. Every morning at eight-thirty for 10 to 15 minutes, she would sit at her desk, pencil poised over paper. Beginning with a silent prayer to protect her from evil spirits she would meditate and enter the alpha mental state, a light trance similar to the drowsiness experienced right before falling asleep.

"For the first ten days nothing happened," she recounts. "I'd just sit there and pretty soon I'd drop the pencil and go about my usual business. It was discouraging. But then on the eleventh day a force like I've never felt before or since suddenly took control of my hand and began creating figure eights and circles. It was a tremendous power, and I couldn't have stopped the pencil if I had wanted to."

It was a typical initiation, she was told by others who had mastered the skill. And from this simple beginning the sessions quickly progressed to messages from deceased family members. Eventually an unknown spirit identifying itself as Lily took control of the pencil and assembled a group of 12 Guides.

When the process became too rapid for handwriting, Montgomery and her team graduated to the typewriter. "I was always a fast typist," she adds, "but when the Guides take over it goes like the wind."

While it was still a novelty, Montgomery says, she religiously practiced automatic writing every day. Now, however, she does it regularly only when working with the Guides on a book but always at the appointed hour. "It's important to do it at the same time every day, when your Guides know that you'll be there," she warns. "Otherwise, once you have opened yourself up to communication, it's just as easy for a mischievous spirit to come through as it is for your own Guide. Besides, they have more things to do on the other side than just follow you around all day and be there when you decide to pick up a pencil. So you establish a date with them."

Montgomery feels her part in the process of writing the books is similar to her earlier career as a political journalist and foreign correspondent. "It's really a reportorial job, relating what the Guides have told me," explains the former president of the Women's National Press Club. "It's not very different from interviewing a president or a monarch and then telling their story, describing the background, circumstances, quoting them and interpolating."

She agreed to maintain communication with the Guides because, she says, "They insisted that I was to be their instrument. The information wasn't meant just for me; it's for everyone." And as far as she knows, it is her only psychic ability.

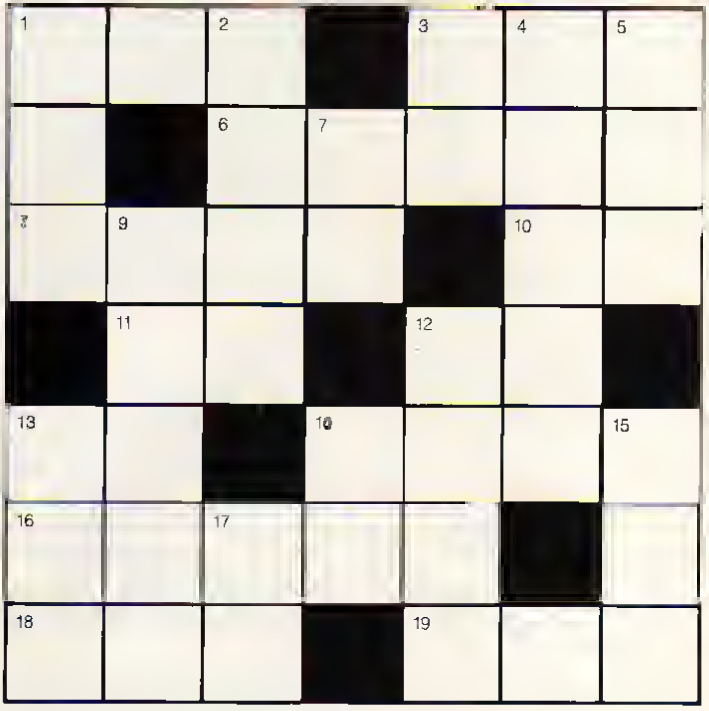
Most paranormal researchers, however, do not believe Montgomery or anyone else is communicating with otherworldly beings. "It's actually more spiritual than psychic, just metaphysical pap," says Marcello Truzzi, director of the Center for Scientific Anomalies Research. "Psychologists recognize the validity of automatic writing as a valuable tool that can lead to some insightful and profound statements. But no one has ever offered any proof that it is more than subconscious revelations."

The Guides' discourses have included everything from creation, the future of the world, and the meaning of life to reincarnation and extraterrestrial visitors. Despite the diversity of their subject matter, however, all this higher truth appeared rooted in the Christian religion—until recently. "I think they felt that in order to reach me to be more convincing, they had to spoon-feed me," she says. "I'm like a student they've been carefully grooming. They avoided dumping everything on me at once. And using Christian concepts made it easier for me to understand and accept their material. Each book is another step in my evolvement."

Over the years, Montgomery now believes, the Guides seem to have been slowly building a case for Eastern philosophy as well. "They have only hinted at it before," she says. "But I have a hunch it will be the subject of our next book." ∞

Dedication.

If you have conviction and dedication, you can solve this J&B cross-number puzzle. Note: keep a dictionary and an almanac nearby; they may prove useful.



CLUES

ACROSS

1 *Car*____, *Where Are You?* plus *Hawaii* ____ plus ____ *is Enough* minus ____ *Life to Live*

3 Lou Gehrig's consecutive-game streak divided by the point value of a jack in blackjack.

6 George Orwell's famous novel times the number of wives of Henry VIII.

8 The number of cans in a case of beer times (the age at which a person is no longer an octogenarian plus the number of cells in an ostrich egg)

10 Yards of Tom Dempsey's NFL-record field goal minus height of a basketball hoop, in feet

11 *Summer of* '____ plus the number on a solid-green billiard ball

12 Justerini & Brooks's address on St James's Street in London minus 19____, the year Gus Zernial led the AL in RBIs and homers

13 ("PEnnsylvania ____-5000" times V-____ vegetable juice) minus handshake request ("Gimme ____ ")

14 "____ Tons" (song title) times "____-ton" Tony Galento times cat-o'-____-tails times the floor number that is missing from many buildings

16 Satanic number times "Get your kicks on Route ____ "

18 The lowest prime number greater than 25 times the highest prime number less than 25

19 The year of Lindbergh's famous transatlantic flight minus the year of Columbus's famous transatlantic voyage

DOWN

1 Period of Halley's Comet in years plus the number of pieces of silver for which Judas betrayed Jesus plus the bowling pin directly between the 3 and 10 pins

2 ____ drummers drumming times ____ pipers piping times ____ ladies dancing

3 Pawns in a chess set plus "snake eyes" plus the point value of letters J & B in Scrabble

4 The Munsters' address on Mockingbird Lane times the reciprocal of (one-twenty-fourth plus one-twelfth)

5 *Snow White and the* ____ *Dwarfs* times the ____ Seas times the Chicago ____

7 MMCLVI divided by CLIV

9 Bytes in a kilobyte (be careful! it's not a thousand) times Carbon ____ test for dating ancient items

12 The age at which Teddy Roosevelt became president of the United States times the number of players on two football teams and two lacrosse teams

13 (Number of dollars in Luxury Tax in Monopoly times combined number of Chance and Community Chest squares in Monopoly) minus Railroads in Monopoly

14 (July date of Bastille Day times sixties rock group Dave Clark ____) divided by the number of nations on the island of Hispaniola

15 Age of the girl in the Beatles' "I Saw Her Standing There" times the median of 9, 16, 25, 36, and 49

17 Stars on a WWI American flag plus gold prospectors "____ers"

Look for the solution to this puzzle next month in *Omni*

Found art
Winners of Competition #37

GAMES

By Scot Morris

In June 1985 we asked readers to look at commonplace objects in a new way with an eye for humanizing the inanimate for finding life in the lifeless

Our grand prize winner receives an Olympus OM-PC Program camera with ESP metering Four runners up each get $100 cash and all five receive one year subscriptions to *Omni* and a copy of the book *Omni Games*

PRIZEWINNERS

1 We allowed entrants to send three photos These two entries—one of a canteen the other of an overturned tea kettle—are by Wallace Jones of Wilmington California

2 This frog face found on the rear end of an old tractor, is by Gilles Benoit of Ottawa Ontario

3 A plastic jug in the afternoon sun was sent in by A Malakates of Miami

4 David Pursley of Sandy Utah found these wheel pulleys on an old logging truck in Idaho They look like a couple of good ol country boys he writes Yup

5 "My discovery of this Oriental face was quite Occidental writes Lee A Stewart of Atlanta The pipes and boiler plate right out of *Terry and the Pirates*, were behind a laundry/dry cleaning building in Raleigh North Carolina

HONORABLE MENTION

6 Lindsay Bartolini sent us this expressive manhole cover shot near his home on Rue Chapon in Paris.

7 We frowned on arranged scenes but couldn t resist these three gourds by Phil Hayes of Lakewood Colorado

8 The same goes for the red pepper with eyes added by Edward C Johnson of La Jolla California

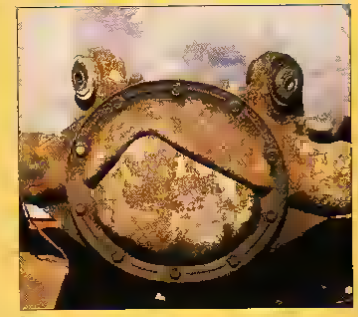
9 This faceplate is contributed by D A Giorgi of Basking Ridge New Jersey

10 David M Maylen III of Oak Park Michigan says of the menacing face on this 20-ton punch press The jaws of this unit took my brother s fingers off

11 Kate Lynch of Seattle says I found this melancholy little fellow on the wall of my apartment I imagine he s sad because he's never been used In fact


1A


1B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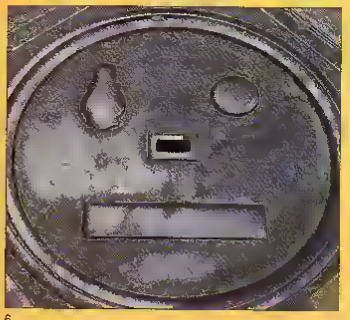

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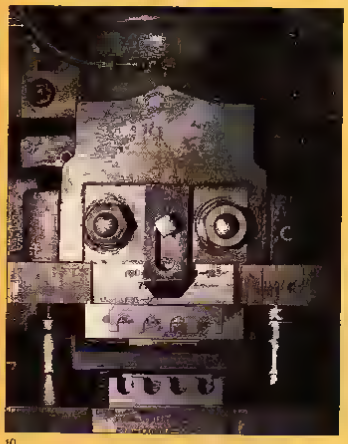

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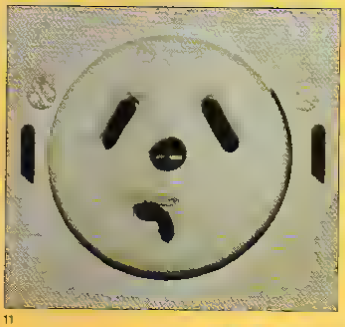


11

12

13

14

until this competition he'd never even been noticed.'

12. Dan Konkle of Grand Rapids is one of the many readers who noticed this face on the top of a grated-cheese container.

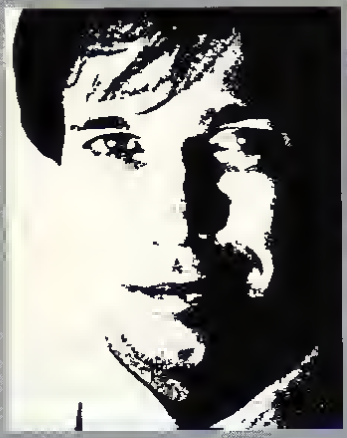
13. Rozlyn R. Masley of Fayetteville, North Carolina, photographed this building under construction near Washington, DC.

14. Coskun Caglayan of Tustin, California, saw this ageless squaw on a rock cliff by the Black Sea.

TREASURE HUNT WINNERS

Omni readers have done it again! They've proved they're more involved, more perceptive, and more motivated than readers of other magazines. How do we know? The response to the Great *Omni* Treasure Hunt, introduced last February, was overwhelming—a record-breaking 407,350 entries. According to a

CONTINUED ON PAGE 113



LAST WORD

By Terry Runté

"He possesses that elusive, nameless substance that no one talks about, thinks about, or even thinks about talking about. He has a major helping of the wrong stuff."

They say there's a demon in that wind tunnel, way back in there near the outside of the envelope. They say that if you get too close to him he'll muss up your hair and blow stuff in your eyes and whip your tie up over your shoulder where you'll forget about it, and people will point and laugh at you, and you won't know why. Someday I'm gonna go in there and wrestle with that demon and bring him outta that tunnel and let him go in my boss's office and blow all the papers outta his in box.—Michael "Mick" Haeger

They call them the armchair aces, the wind warriors, the tunnel boys. They're the men who, day after boring day, sit in fake cockpits, or "mockpits," flying tiny model airplanes through the phony turbulence of The Tunnel. And if you hang out long enough at the pilots' lounges where the tunnel boys gather and fib about their exploits, you'll eventually hear about one "pilot" in particular, Michael "Mick" Haeger.

Haeger is more than just another wind-tunnel test pilot—he's the best. He has reached the top of the pyramid, the peak of Mount Everest, the spire of Notre-Dame, the pinnacle of the needle in downtown Seattle; he has, metaphorically speaking, sat on the top of any tall, pointy thing you can name. Haeger possesses that elusive, nameless substance that no one talks about, thinks about, or even thinks about talking about. This something, this *it*, involves stupidity—and much more. To reach this apex of idiocy requires more than mere daftness. Having one's nut loose simply will not do. Haeger is more than just another dolt. He is so dumb that when he climbs into his mockpit, he genuinely believes he's flying. In other words, he has *the wrong stuff*.

Recent advances in computerized flight simulation have made the experience of flight uncannily real—from the takeoff, to the flight itself, to the landing, and yes, even to a crash. A genuine test pilot has to worry only about dying once, Haeger will tell you, but a wind-tunnel boy—he may have to die several times a day. And no one has "crashed" more times than Michael Haeger, a man who lives the life of a test pilot—up to a point.

On an average day he wakes up at 4:00 A.M., still drunk from the night before, in order to simulate a real test pilot's state of mind. For the same reason he has a breakfast of chewing tobacco and beer. Slipping on his flight jacket of simulated leather, he heads off to work.

Two hours later, reeling with nausea, his head throbbing, Mick is strapped into the mockpit of a Lockheed ultrastealth supersonic jump jet, an invisible jet fighter so advanced that it could take off and land vertically at 80 times the speed of sound—if it existed. Which it doesn't. Haeger doesn't know that. You see, HE'S NEVER BEEN IN A REAL PLANE! He wouldn't know a jump jet from a '52 Plymouth. When the console lights up and the flight display flickers on, he is convinced he is in a real cockpit.

But the feasibility of making such a plane is not on the flight engineers' minds. If they built such a plane, would anyone be dumb enough to climb into it, and what would happen to him if he did? To the first question Haeger stands as a mute answer. As for the second:

Haeger pokes at the buttons on the control panel until he hears the simulated roar of the plane's engines. He flips a few more controls, and the plane seems to shoot straight up. The mockpit hasn't moved more than a few feet, of course, but the video projection of the blue sky rushing up at him is so real that Haeger is convinced he's miles above the earth. He watches his altimeter spin, marking off the altitude until it tells him he has broken through the earth's atmosphere and is hurtling into space. The airspeed indicator on the plane says he is screaming through space at nearly twice the speed of sound. He begins to think about what happens to the human body at that speed—how the g's can stretch a man's face, pull back his jowls, compress his skull, and force the eyes deeper into the sockets. At the thought of all this, Haeger does what he is most famous for—he panics and passes out.

Out of control, the plane's "flight degenerates into a slow tumble. But just as it reaches terminal speed Haeger comes to and in the nick of time pushes the button marked EJECT. Unfortunately, the plane is now upside down, eight feet above the ground.

For the tenth time the phone rings, and for the tenth time Haeger's wife, Marybell, picks it up. This is the most difficult part of the life of a simulator pilot's wife. There will be a simulated funeral, with a simulated pastor and a simulated 21-gun salute. Marybell, dry-eyed, will sob into a Kleenex, feigning grief. But first she must deal with the calls of fake condolence from Mick's fellow phony flyboys. And invariably the voice on the other end will have the same innuendo. "Uh, hello, Marybell, this is Karl [or Craig or Neil or—yes—Buzz] Mick and I were real good buddies, and I uh, was wonderin' that since Mick died a horrible simulated death and is burned beyond all recognition and stuff, are ya doin' anything tonight?"

Some folks say Terry Runté was the first man to break the sound barrier on Interstate 95 in a '65 Dart. Others say he's a humor writer with the wrong stuff. One thing's for sure: he wrote this stupid bio himself.