

THE SEARCH FOR GOD

OMNI

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THE GREAT WALL OF THE COSMOS • REINVENTING RELIGION • MANIPULATING REALITY • DAN QUAYLE'S POWER OVER SCIENCE

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The Mind of God

By A.J.S. Rayl and
K. T. McKinney

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FIRST WORD

KEEPING THE FAITH: Americans hold fast to the Rock of Ages

By Father Andrew Greeley

Father Andrew Greeley is a professor of sociology at the University of Arizona and a research associate at the National Opinion Research Center. His latest novel is *An Occasion of Sin*.



Everyone who reads the feature articles in the national press knows there is a decline in American religion. Everyone knows that within this "trend" there have been lesser trends: a religious revival in the Fifties, a religious decline in the Sixties and Seventies, and then another revival in the Reagan, conservative Eighties.

When we consider the fluctuating age structure of the population and the changes in the Catholic Church, however, none of those much-heralded phenomena ever occurred. American religion hasn't changed much in the last 60 years and it is not likely to shift for the rest of this century.

Religious attitudes are reflected within a life cycle. Devotion begins to decline in a person's middle teens, reaches bottom in his or her twenties, then begins to pick up again, and reaches a plateau when someone reaches his or her mid-forties. An analysis that Michael Hoult, chairman of the sociology department of the University of California at Berkeley and I have done demonstrates that the shape of the age curve has not varied in any age group for the last three decades, except for a onetime de-

cline among Catholics that occurred during the time of the 1968 birth control encyclical.

Evidence on the experiences of previous age groups, including those who matured during the Sixties, strongly suggests that young people today will be as devout in their forties as their parents. And their parents were as "undevout" in their early twenties as are the young today. Just as every young adult thinks he or she has discovered the pleasures of sex for the first time in history, so every twenty-year-old thinks he or she has for the first time discovered the pleasures associated with rejecting religion. The "religious revival," about which I receive a phone call at least once a month, is nothing more than the restoration (aging) of you and of people from the late Sixties and early Seventies.

Looking at the survey data for the last half century, more than 95 out of every 100 people believe in God, three out of four are certain about life after death, three out of four believe in the divinity of Jesus Christ, three out of five believe in hell, two out of five go to church once a week (three out of five of those are over forty), nine out of ten pray every week, one out of two prays every day and one out of four prays more than once a day.

It is true that church attendance declined in the late Sixties and early Seventies, but this phenomenon was limited to Catholics and was a result of a reaction to the controversy over the Catholic Church's rejection of birth control. In addition, the decline in church attendance correlates with political loyalty: there was only a 6 percent decline among those who strongly identified with a political party and a 30 percent decline among independents. This decline ended in 1975.

In the last three decades, belief in the literal interpretation of the Scripture declined among Catholics and then only among younger, especially college-educated, Catholics. However, this change was consistent with Catholic teaching that not every word is literally inspired.

"Mainstream" Protestant denominations (particularly the Methodists) lost members, while Evangelical and Fundamentalist denominations gained membership. This shift, however, did not involve a change in doctrinal attitudes among those joining a new religious group. The evidence suggests that the denominations moved away from their members instead of vice versa.

Three decades ago, about a fifth of Americans believed in the literal inspiration of the Bible, they were born-again and tried to persuade others to "decide for Jesus." That proportion of Americans has neither increased nor decreased but has always been an important component of American society. The last great awakening, like the born-again movement, occurred in 1744. In the 1890's the national media rediscovered this religious sect and aligned these Americans with the Reagan era.

All these developments are interesting and indeed important but they do not imply any significant long-term decline—or long-term increase—in American religious belief.

If American religion hasn't changed, then why do so many journalists and academics, who have easy access to the data and ought to know better, think that it has? Perhaps the answer is that they themselves have for one reason or another drifted away from their religious origins and project their own experiences on the rest of us. ☐

OMNIBUS

THE MEASURE OF ALL THINGS

Spurred by ageless riddles, our writers plumb the infinite depths of space and mind

During the great age of discovery in the fifteenth and sixteenth centuries cartographers revised and expanded Europeans' knowledge of the world with maps of the explorers' findings. Modern mapping is now transcending the earth as it sails into space. In "Great Wall of the Cosmos" (page 34) Andrew Chalkin examines cosmologists' efforts to map the structure of the universe. An



astronomy enthusiast, Chalkin steals time to gaze through the nine-inch-diameter refracting telescope on top of the Harvard-Smithsonian Center

for Astrophysics in Cambridge, Massachusetts. A former assistant editor at *Sky and Telescope*, Chalkin has written for *Air & Space*, *Smithsonian* and *Life*. His current project involves a five-year effort to compile the experiences of the Apollo lunar astronauts.

Asking scientists about God encourages immediate reactions that range from nervous chuckles to heavy sighs. That, however, didn't daunt writer A. J. S. Rayl and *Omnis* executive editor K. T. (Kevin) McKinney ("The Mind of God," page 42) in their effort to answer the question, Can science prove the existence of God? For a variety of reasons, not every scientist wanted to attempt an answer. One Nobel laureate, for example, seemed offended that the writers would even consider such an idea for a story and hung up on Rayl without further comment. "In the end, those scientists who did respond—and most did—offered an array of ideas and opinions that at the very least serve to stimulate the gray matter," says Rayl, who is a frequent contributor to *Omnis*. Coauthor McKinney has also written for *Newsweek* and *The Advocate*. His book *Everyday Geography* (Byron Press/Literary Guild) will be published in April 1992.

In "Techno-Wizards and Couch Potatoes" (page 50), Kenneth R. Hey looks at the growing gap between techno-liberates and techno-litantes. Hey is managing partner of Inferential Focus, a firm that provides corporations, government agencies, and money managers with early insights into social, economic, and political shifts. He has written for *American Demographics*, *The Journal of Popular Culture* and other academic journals. And his firm, Southern Voices, Am-

erican Dreams focuses on the popularity of Jimmy Carter, Kurt Reynolds, Ted Turner and others in the Seventies.

Contributing editor Tom Dworzatzky inaugurates Political Science (page 22), a column that probes the ways research findings become public policy, a process that Dworzatzky says is "not too different from 1166, magnon being turned into hot dogs."

Contributing editor Murray Cox (Forum, page 10) traveled to Seattle to meet with social historian Morris Berman (Interview, page 60). "Nice town, lots of hills," says Cox. "And mountains, real damn mountains with a full moon so close to Earth, I could stretch out my arm and touch it. It seemed the perfect place to ponder Berman's lofty views and such questions as, Is there such a thing as a true ideology? and is reality nothing more than a cultural artifact?"

In Southern California, some scientists anticipate the arrival of icebergs. The idea of hauling the ice masses from Antarctica isn't as weird as it sounds, according to Curt Wohleber (Earth, page 18). "Anything seems possible in the parched Los Angeles area," says Wohleber. "One medium-size berg would produce six trillion ice cubes," he says, "enough to stretch to the sun and back— if you could do it before they begin melting."

Jack Darrn ("Voices," page 65) is the author or editor of more than 30 books, including the science-fiction novel *The Man Who Melted* (Doubay Books, 1984). He is currently at work on *The Ash of Remembrance*, a historical novel about Leonardo da Vinci.

The work of photographer Peter Menzel ("Blackball," page 54) has appeared in *National Geographic*, *Geo*, *Smithsonian* and other publications. **DD**



Clockwise from bottom: Andrew Chalkin, Eric's Garden Compound by Peter Menzel, A. J. S. Rayl, and Kenneth R. Hey.



FORUM

LOSING MY RELIGION:
Ultimate questions are with us always

By Murray Cox

My boss walked into my office recently and said, "I want you to write August's Forum on God and the future of God." God? I stammered, wondering if he'd lost his mind. *Spiritus sanctus?* Actually, I'd rather pass on that. I responded "No," he said, "you've got it."

In northern Nigeria, there is a proverb in the Hausa language—the language I spoke as a child—that would have stopped him in his tracks: *Mu bar kaza cikin gashinta*. Translation: "Let us leave the chicken in its feathers." Meaning: "No way, man, stop back, you messer! In stuff you shouldn't be messer in." It is a polite but forceful "no." When uttered it is rarely challenged. I didn't break into Hausa, or any English equivalent, however, because I immediately felt an urge, an imposition, a dire necessity that I couldn't comprehend—do it, do it, pluck the bird.

First I collected some statistics that really surprised me. Nine in ten Americans say they have never doubted the existence of God. Eight in ten believe they will face judgment "on the last day."

More than 90 percent of us claim we pray at least once a week. Since the Gulf War, we've returned en masse to worship about respective affairs. I'd say based on the stats, God's future is secure and we are the ones who will ensure it. And I'd bet, as we approach the next millennium, we will see even more religious fervor.

I began to jot down ideas and questions. All religions presuppose the existence of God, beliefs possess us—we don't possess them; *Deus absconditus*; *disparanz* and/or (wholly other), God-love. Do I assume the existence of a serious skeptic in every person? Ludwig Wittgenstein: "What did I know about God and the purpose of life? That something about it is problematic, which we call its meaning." I looked through a syllabus from my days in seminary, glanced at a few manuscripts of sermons I'd preached, and finally read Carl Jung's *Answer to Job*.

I felt "old things" rise up, a loss, sadness, some confusion, a sense of reaching a boundary, an edge. I found questions left unanswered or answered in an easy offhand manner, as if I'd transposed huge chunks of meaning from one side of the ledger to the other. The God of my fathers, the God of Abraham, Isaac, and Jacob, got transmuted into God as Self symbol, archetype. But what did the symbol express for me? I hit a wall. I "had" an archetype with no center of meaning.

Very early in the project, a wild hotel—personifications of "issues" I'd noted on an old AT&T bill—moved into my small apartment. "We're three conundrums," they announced in unison, "Evi, Death, and Meaning; here and there, above and below before and after. Solve us, and we'll leave." What had I noted? God and the question of evil; God and the question of death; God and the question of meaning. A noisy, disrespectful lot: they pulled books off my shelves, hid my notes, and hacked their way into my computer, deleting and adding what they wanted.

I needed a break. I attended a film festival held at the Angelica Theater in lower Manhattan.

I put together by the Human Rights Watch, an organization that monitors human rights abuses in more than 60 countries. I saw 18 films documenting or dramatically portraying "disappearances, torture, imprisonment, and exile." "It's cruelty for cruelty's sake!" said a victim of Castro's brutality. A Guatemalan Indian cried "Oh! my God, the blood on the walls of the jail!" Ya, I thought. *Oh! my God!*

I swam through one emotion after another—rage, fear, revenge, sadness. And then, at the end of each day, as if I had walked through a crack in the wall of the dark theater, I entered a vast landscape, a great expanse, and stood on holy ground, the ground of incalculable human suffering and pain, and I bowed before the human spirit, which endures and endures and endures for 10, 15, 27 years, say, at the bile of Pineson prison (torture center) in Cuba. How is it possible? I asked. And "Evi," who had followed me to the corner of Houston and Mercer streets, averted his eyes—only for a moment in the darkness, I wrote the lyrics of a song: "Though we are beaten, we still sing, though we are beaten, we still laugh, though we are killed."

So many disappearances. So many dead people. That week I pulled out an old journal. "Varanasi: Today, I stood on the banks of the Ganga, the sacred river we call the Ganges, and watched old Hindus sit at the river bank, awaiting death, listening to the sounds of the star, cymbals, and drums that floated out of the temples that lined the shore. Water buffalo, submerged to their necks, looked satisfied, snug. Kids swam or splat buffalo shit on a wall to dry. A group of people gathered around a woman laid

Higher necessities: Solving the enigmas of evil, death, and the meaning of strife.



EARTH

L.A. THAW

Could Antarctica's ice end California's drought?

By Curt Wohleber

Terry Spragg is no stranger to innovation. He was the first to plaster adhesive foaments on shopping carts—in Seattle in the early Sixties. But his latest project breaks new ground, or rather, ice, on a truly epic scale. Spragg plans to solve Southern California's fresh water shortage by towing in icebergs from the Antarctic.

The area uses 3.5 billion gallons of water each day, and Los Angeles' Metropolitan Water District (MWD) estimates that the demand will outstrip supply by the

end of the decade. Though fresh water is scarce, fuel lines and antinuclear environmentalists are plentiful.

Spragg believes his alternative solution is obvious: Three quarters of the world's fresh water exists in the form of ice, and 90 percent of the ice is in Antarctica. Some estimates put the continent's potential annual iceberg yield at more than 300 billion gallons of water. "Icebergs are more environmentally benign and can more easily obtain public support than the other options," Spragg says.

year later. By this time, the berg would have melted to approximately half its original size. This would still leave roughly 300 billion gallons of fresh water.

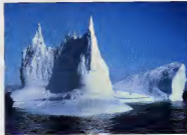
Later still, in the early Seventies, Rand Corporation physicists John Hult and N. C. Gebhardt prepared a detailed study for the National Science Foundation titled "Antarctic Icebergs as a Global Fresh Water Resource." Scientists would identify icebergs for harvesting, according to the Rand report. Enormous nuclear-powered convoys would tow the bergs.

Iceberg towing, however, has a Jules Verne quality that makes people skeptical. The scholarly lampoon *The Journal of Improbable Results* roundly parodied the physicists' concept and in the end, the Rand report garnered little support. "It kind of fell into a hole and died," says John Finguhel, a former Rand employee. Still, one man took it seriously—Rand employee David Ranfeldt, who told his friend Terry Spragg.

Having worked on the iceberg project for 16 years, Spragg now plans a trial run. Just how Spragg plans to move the giant ice cube is shrouded in secrecy reminiscent of multibillion-dollar Pentagon projects. "It's a seamanship problem," says Spragg's colleague, Cliff Goudley, a naval architecture specialist. In order to moor an iceberg off Los Angeles, the two must consult with more than a dozen local, state and federal agencies.

As for funding, Spragg eventually hopes to get support from oil-rich, water-poor Saudi Arabia. But he also expects to net some \$300 million from the pilot project by opening the iceberg as the world's only melting theme park. Better yet, revenue could come from a form of Spragg's earlier idea: iceberg billboards. ☐

Bringing these massive icebergs to Southern California may eventually put the freeze on the region's water woes.



end of the decade. The MWD is currently negotiating with other water companies for surplus water and has implemented rigorous conservation measures to reduce demand in the short term.

Over the long haul, however, the MWD is considering the construction of new desalination plants, possibly even nuclear-powered, which would allow the city to tap the abundant—and conveniently located—Pacific Ocean. But any kind of nuclear reactor in Southern California could prove problematic.

The idea of stringing icebergs, of course, is not new. In the late Fifties Scripps Institution oceanographer John Isaacs said that it would be possible to harvest Ant arctic icebergs and bring them to Los Angeles. In his plan three tugboats would maneuver a ten-mile-long, half-mile-wide iceberg into the Humboldt Current, which runs along the western coast of South America. Near Ecuador the tugs would steer the berg into other currents on a roundabout Pacific odyssey that would land the iceberg in Los Angeles about a

POLITICAL SCIENCE

DUKES OF HAZARD:
Are federal cost cutters braking the rules?

By Tom Dworetzky

Nowadays your average government regulation is likely to have had science at its core. Unfortunately by the time said science has mutated into public policy, it's usually been mixed with so much hope, fear, economics, political ideology, religion, and philosophy that you've got no more chance of separating fact from spin than you would have breaking a sausage down into its original ingredients.

This column focuses on sausages: policies that result from the meeting (or collision) of scientists, bureaucrats, and politicians (and anybody else who can get in on the fun). Consider what happened when the EPA tried creating regulations mandating the recycling of lead-acid batteries—instead of allowing their incineration in municipal combustors

Before the EPA—or any federal agency—can make a rule, the budgetmasters at an Office of Management and Budget (OMB) division known as the Office of Information and Regulatory Affairs (OIRA) must give it their okay. Set up originally to reduce government red tape, OIRA has evolved over the years into an executive branch Reich Motel of black hole dimensions. Regulators contrary to administration policy check in, but they don't check out. The glue is known as cost-benefit analysis (basically weighing the costs of implementing a rule against the value of its benefits). The problem is that you can adjust the costs and the benefits to make any case you like.

OIRA has done such a fine job of thwarting environmental laws that Congress has refused to approve a new OIRA administrator for the last year or two. To overcome this, the administration has established the Council on Competitiveness that will oversee the overseers at OIRA. You don't need congressional approval for the head of the council.

Now a lot of people say Dan Quayle is a joke, but not me. He's heading up the council, and that's no laughing matter. Including such luminaries as the President's chief of staff John Sununu and OMB head Richard Darman, the council will surely become the vital crossroads where science meets politics head-on. In a March 22 memorandum to the heads of all executive departments and agencies, Quayle set the stage for what is to come. The memo states that the council will review press releases, strategy statements, policy manuals, grant and loan procedures, agency guidelines, and advance notices of proposed rule making. Quayle's memo suggests that the council expects cost-benefit an-

alysis of documents including press releases. That's bound to create a paperwork logjam.

Formed in July 1980, the council has made one significant decision: rejecting a proposed EPA regulation concerning municipal waste incinerators, saying that its costs weren't worth its benefits.

What costs? What benefits? EPA scientists determined the lead-acid batteries are behind 60 percent of the lead found in our country's garbage. We know the devastating health effects of lead exposure—especially for children. The agency proposed a municipal incinerator regulation that would force the recycling of lead batteries. By cost-benefit calculations, including various health costs and damage to the ecosystem, the benefits of such a rule seemed well worth the cost of implementing it.

But the council claimed the rule "did not meet the benefits-cost requirements for regulatory policy," rejecting the recycling proposal without providing any analysis to support its assertion. The EPA, whose job is protecting our environment, did as told.

Is the cost of reducing cancer deaths from lead, particularly among children, too expensive for the council? Isn't it ironic that just a couple months ago the vice presidential residence had its water tested for a variety of toxic substances, including lead? Seems the doctors wanted to see if some environmental hazard had anything to do with the Graves disease afflicting the President and First Lady, and Miller's lupus. They'd all spent eight years living there.

Oscar Wilde once said that a cynic knows the price of everything, the value of nothing. Maybe Vice President Quayle will think about that the next time he uses his residential tap. ☐

Seriously:
Our health and safety lie in the hands of Dan Quayle





CONTINUUM

TAKE A BIKE!

Wheels are churning, millions are cruising—on pedal power. Also, leeches on the comeback trail, and galaxies lost in static

There I was, stuck halfway up a hill somewhere in Switzerland. I was testing—firsthand—the proposition that the bicycle is the vehicle of the future. The people at the Worldwatch Institute in Washington, DC, had suggested that intriguing idea to me. "The bicycle is the vehicle for a small planet," said the institute's Marco Lows. She enumerated the horrific consequences a country suffers as a result of its dependence on the car: road accidents, air pollution, urban congestion, crippling dependency—the automobile's toll is a terrible one, and it gets higher every year.

But if the bicycle is the vehicle of the future, am I ready for the future? I asked myself as I gaspingly inched my way up the steep Swiss incline. Grittingly grinding out a few painful revolutions of the pedals, I said—to myself (my mouth was too parched to speak)—Perhaps the bicycle has a place in the future, but I do not.

It was only day two of Travenç International's (Watkinsbury Center Vermont) "bicycling vacation" tour. We were wheeling our way through the picture-book beautiful countryside surrounding the eight Swiss lakes between Geneva and Lucerne. Travenç was definitely the choice of those who would prefer a well-cushioned ride into the future, supplying us with tour guides and first-class hotels to ride home to at the end of each sweaty pedal-pushing day.

The group also provided plenty of handily commode spokes ready to dispense bicycle propaganda at the drop of a handlebar. According to this bunch, the bicycle was more than a desperately needed alternative to automobile-confined transportation. It was also the perfect vehicle—literally and figuratively—to steer us all into the new small-planet era of more harmonious and luminous human relations. Cyclists love to tell you that your chances of meeting and even knowing other people in a new place are increased dramatically if you are on a bike. After a week of being overwhelmed by the Swiss people's enthusiasm for our little parade of flag-fastened bicycles of many colors, it did seem as though once you climbed into the saddle, you instantly



fall into a closer cadence with the rest of mankind.

This may be because in many parts of the world the "future" has already arrived. Shocking though it may be to the so-to-economized American, the world's 800 million bicycles outnumber cars by two to one—and each year bike production outpaces automobile manufacturing by three to one. Bicycles in Asia alone transport more people than do all of the world's buses. "One of the greatest ironies of the twentieth century," says

Lows, "is that vast amounts of such precious things as land, petroleum, and clean air have been relinquished for motorization, and yet most people in the world will never own an automobile."

My first days on the bike had made it agonizingly clear that I wasn't really in great physical shape and that I lacked a certain, shall we say, *feel* for the machine. Yet even at that low ebb, there were glorious compensations. After a long crawl up miles of sloping vineyards, for instance, there was the view from the summit: the blue and green of Lake Geneva, and just beyond it, Mont Blanc. "Easy to see how the Romantic poets went gaga over all this," one laconic biker remarked. And arriving at the top meant miles of downhill to come. The wondrous, exhilarating descent—man can truly fly—marked my first taste of those "wild cycling sensations" I had heard so much about.

As the days rolled on, I increasingly savored the opportunity cycling gave me for the slow discovery of a place and its people. By day five, I envisioned myself riding my little green Nashua bike in the Tour de France, just like Greg LeMond, or, at the least, like Poo-woo Herman. By the tour's end, I found I absolutely agreed with my whole mind—if not quite yet with my whole body—with the British cyclist and author James McGurn, who wrote: "The bicycle is the vehicle of a new mentality. It quietly challenges a system of values which condones dependency, wastage, inequality of mobility, and daily carnage. There is every reason why cycling should be helped to enjoy another Golden Age."

—MARION LONG



CONTINUUM



Monkey see, monkey do: A clump seemed how to make and use a stone knife after watching humans demonstrate.

HIGH-TECH CHIMP

Karo, a ten-year-old bonobo, sometimes called a pygmy chimpanzee, knows not only how to use a Stone Age knife but how to make one. Researchers taught Karo these skills as part of a study, conducted by Nicholas Toth and Kathy Schick of the CRAFT Human Origins Research Center at Indiana University to compare the use of Stone Age technology by chimpanzees and early

hominids, among the first users of such tools.

Within a day after being shown how to use a sharp stone flake to cut a cord banding a box with a treat inside, Karo had the procedure down pat. Soon he chose the sharpest flake. Shown how to make a knife by pounding one stone against another, he began making his own.

Psychologists Suz Savage-Rumbaugh, Duanne Rumbaugh, and Free Sawaik of

SOME EVIDENCE SUGGESTS THAT A CHIMPANZEE IS SMARTER AT BIRTH THAN A NEWBORN BABY

THERE ARE ABOUT 2 TO 3 MILLION SWEAT GLANDS IN THE HUMAN BODY, IF UNCOOLED, EACH SWEAT GLAND WOULD MEASURE ABOUT 50 INCHES LONG

the Georgia State Language Research Center, operated in cooperation with Yorkie Regional Center at Emory University have been collaborating with Toth and Schick since the chimpanzee study began in May 1990.

Next, Karo has to retrieve a treat from within a drum by slitting a transparent drum-head. "He will find he has to make his tool bigger and better," Schick says.

—Robert W. Tinsley

I WANT TO DRINK YOUR BLOOD

The advent of modern medicine, based on science rather than superstition,

eliminated leeches, used for hundreds of years to "cure" ailments ranging from headaches to yellow fever, from the doctor's office. But the success of an anticoagulating drug made from the creature's saliva indicates that their banishment may have been premature. At least a dozen pharmaceutical companies are racing to produce a genetically engineered form of the drug, known as hirudin.

James Chesebro of the Mayo Clinic, in cooperation with Ciba Geigy, recently began using hirudin to prevent or repair arterial damage in pigs. The results

lead him to believe that leech hirudin could be more effective than the current anticoagulating drug, known as heparin, which fails about 15 percent of the time.

"It totally prevented thrombus [blood clotting] in the arteries after injuries to the deeper layers," he says. "We had not seen anything that could totally inhibit the thrombus."

Chesebro followed up his experiments with preliminary tests on humans to determine dosage levels. He needs to conduct more animal studies, however, before he can treat heart attack patients with the new drug, he cautions.

Hirudin made from the saliva of European leeches, surpasses heparin in another important area: It doesn't provoke allergic reactions. Chesebro chalks this advantage up to evolution.

"A leech has to stay on the animal for quite a while to acquire its blood," Chesebro says. "So if it elicited an allergic reaction, the animal would probably sneeze it off." —Jim Hopkins

"Science is nothing but developed perception, integrated intent, common sense rounded out and minutely articulated."

—George Santayana

OUT OF THE SHELL

While most people probably prefer the edible insides of crabs and lobsters, scientists have recently found a variety of uses for the crustaceans' shells. A Japanese company already produces a line of sportswear using a derivative of chitin extracted from crustacean shells, and making bandages from the substance may be the next step.

The second most common organic compound on Earth (behind cellulose), chitin gives shape and durability to crab and lobster shells as well as mushrooms. Researchers at the North Carolina State University College of Textiles and elsewhere have discovered ways to convert chitin, which

can be difficult to handle in its raw form, into a more manageable substance called chitosan.

Its abundance as well as its potential for forming very strong fibers make chitosan ideal for use in commercial products. It also stimulates wounds to heal and acts as a hemostatic, stopping capillary bleeding.

Research on chitin has advanced more in the last ten years than at any time since the substance was first identified in 1811, says Sam Hudson, a researcher with North Carolina State's Fiber and Polymer Science Program. "The main problem has been in finding acceptable solvents to dissolve this material so it can be spun into fibers," he says.

—Robert W. Thibodeau



Lobster on the half shell: hold the lobster. A substance found in crustacean shells can be used to make clothes and even bandages.

MASSACHUSETTS INSTITUTE OF LAUGHOLGY

"Humor at MIT is no laughing matter," says Jay Keyser, associate provost of a university noted for its scholarly intensity. Last year Keyser accepted the post of administrator of the school's humor trust fund—arguably the only such position in academe—while standing on his head. "I'll never do that again," he says. "My neck hurt for weeks."

Aurmus Peter deFlores, class of 1998, gave the half-million-dollar bequest to impress students with "the importance of humor in all aspects of life." As administrator, Keyser first brought 1979 graduate Gary Isaacs, who chucked a Wall Street career to go to Ringling Brothers Clown College, to speak to students. Keyser also hopes to persuade the artist Christo to wrap MIT.



Be a clown at MIT.

"If not the entire campus, at least the nuclear reactor."

Lightening things up at a serious place like MIT is a heavy burden, he adds. "Whenever anybody tees me in the butt, I have to tell them a joke. Even worse, folks feel compelled to tell me jokes, which are invariably terrible." People now laugh even when he makes serious comments at faculty meetings.

Even people at other universities don't take him seriously anymore. His academic correspondence has dropped off since the new appointment. "They don't think it's funny," he says.—Steve Nadis

PAGING DR. KILDARE...

In the future, doctors will practice good bedside manners in an unusual way. A doctor and patient can now communicate from thousands of miles away with a two-way computer link that transmits video images of both parties along with diagnostic images.

At a recent trade show in Washington, DC, radiologist James Lear, sitting in front of a Macintosh FX computer hooked to a video

camera, began confering with a patient undergoing diagnostic tests back at his clinic. Diner Moments later, the 3-D X-ray image of the patient appeared on Lear's computer. Lear and his patient reviewed the results together as if they actually were in the same room.

The technology, Lear predicts, "will also make it easier for radiologists to tap the expertise of their colleagues and other specialists across the country."

—Kathleen McAvitt



CONTINUUM



Scientist James McGraw with a 300-year-old Arctic plant.

SEEDS OF CHANGE

How do plants evolve over a few centuries? Plant ecologist James McGraw found out by comparing a living specimen from the seventeenth century with its modern descendant.

Deep beneath the Alaskan tundra, McGraw found perfectly preserved seeds from Arctic plants up to 300 years old. Once thawed, the seeds sprouted, inspiring McGraw and his colleagues at West Virginia University to

see what would happen without. The verdict: It's been hard at work.

McGraw's graduate student Milan Niviyk found the older plant had 20 percent fewer leaves than the contemporary plant, but the leaves were 15 percent longer. Further, as McGraw cooled the air temperature the modern plant's growth increased while the older model, collected during the Little Ice Age (1650-1750), failed to respond to the heat.

"We had models preserved

years could evolve that fast," McGraw says. If plants are adjusting to warmer temperatures and higher levels of carbon dioxide, he concludes, "then the effects of potential global climate change may not be as serious as many fear."

"Whether it's good news for plants, it's a Catch-22 for McGraw: "Testing such effects using present-day plants may be misleading," he says. "Even future plants may be ecologically different." —Peter Tyson

GARBAGE AWAY, WE HEARTIES!

Although it might sound disastrous to some environmentalists, a group of scientists at a workshop at the Woods Hole Oceanographic Institute has recommended dumping some of our wastes in the deepest part of our oceans.

The scientists proposed placing the wastes on the abyssal plains of the deep ocean, four to five kilometers below the surface. About a million tons of waste would be dumped each year for 100 years. The scientists lean toward using "relatively benign wastes" such as sewage sludge and the ash from garbage incinerators because of their consistent composition and fairly predictable behavior.

Through the use of navigational satellites and precise echolocation, each load of waste would be placed at exactly the same spot on the ocean floor in an area of very low current.

to prevent dispersal. The abyssal depths "don't communicate rapidly with the surface by any means we know of," says Derek Spencer, a senior scientist at Woods Hole. It takes about a thousand years for substances here to reach the ocean's surface, he says, and "there are processes in the deep ocean water that remove reactive chemicals in tens to hundreds of years." By then, the waste would be similar to organic detritus.

While Congress has banned ocean dumping beginning next year, Spencer and others feel that the privately funded experiment holds enough promise to justify asking for special authorization to proceed.

—Robert W. Tinsley

"Art as moral passion named to entertainment. Moral passion without entertainment is propaganda, and entertainment without moral passion is television." —Rita Mae Brown

WALANCHES CAN HURTLE DOWN SLOPES AT SPEEDS OF UP TO TWO HUNDRED MILES PER HOUR.

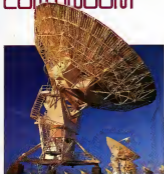
IF THE EARTH WERE LEVELLED SMOOTH, THE PLANET WOULD BE UNDER 7,500 FEET OF WATER.



Under the deep blue sea might be the safest place to store some wastes that might otherwise go to landfills.



CONTINUUM



Faint signals from distant galaxies stand little chance of being heard above the din of the crowded airwaves.

RADIO HAZE

With the proliferation of telecommunications satellites, ham radios, and other devices transmitting radio waves, the airwaves have become as jammed as an L.A. freeway at rush hour. All but forgotten in the cacophony are radio astronomers striving to detect signals from faraway galaxies. But some relief is on the way.

In January A. Richard Thompson of the National Radio Astronomy Observatory in Charlottesville, Virginia, helped forge an understanding with Motorola to unclutter the airwaves. Motorola plans to launch a fleet of 77 satellites to provide cellular phone service to remote areas. The satellites will operate in the frequency band astronomers use to study star-forming regions, but the company will shift to other frequencies when its

satellites are near U.S. radio observatories.

Thompson has also negotiated with the U.S. Customs Service, which uses blimps flying near the Mexican border to track down drug traffickers. Radar signals from the blimps could interfere with radio telescopes in Arizona and Texas. Customs officials have agreed to blink the

**SIR ISAAC NEWTON
DROPPED OUT OF
SCHOOL AS A TEENAGER
AT THE URGING
OF HIS MOTHER. SHE
WANTED HIM
TO TAKE UP FARMING.**

**ON AVERAGE,
A WOMAN EARNS 64
CENTS TO EVERY
DOLLAR A MAN EARNS.**

balloons' radar systems when they are pointed at the telescopes, unless they're in hot pursuit of smugglers.

Despite these two concessions, Thompson says "competition for frequency bands is getting more intense all over the spectrum. Different parts of the spectrum tell us about

different things in the cosmos. Some of those things will become increasingly difficult to study."

Ultimately, researchers may have to resort to putting their radio antennas in remote areas. Thompson has the ideal spot in mind: the dark side of the moon.

—Steve Nadis

MAYAN HERBS CURE THE ITCH

Long before the first anti-itching medication hit drugstore shelves, the Mayan Indians began concocting herbal medicines to treat conditions including athlete's foot and asthma. Those ancient remedies actually work, often better than modern medicines, according to a research team led by University of California anthropologist Brent Berlin.

Although the Mayan empire peaked long ago, Mayan Indians still live throughout southern Mexico. Berlin, working with his wife, Elos Ann, and Mexican physician Xavier Lopez, has cataloged 1,500 different plants the Mayans continue to use for medicinal purposes. Lopez has begun clinically testing the plants most widely recommended for specific ailments.

He ground up one of them and mixed it with an inert ointment to make it resemble modern athlete's foot medicine. After four months of double-blind trials at a hospital in Mexico City, patients using the

herbal preparation had been completely cured of the disease. Meanwhile, standard Western medicine suppressed the fungus but didn't eradicate it, Berlin says.

Five other plants commonly prescribed by the Mayans for diarrhea have killed bacteria and viruses in cell cultures, Berlin adds. Lopez plans clinical trials of the most promising ones.

The Mayans probably learned about the herbs' curative powers through centuries of trial and error, Berlin speculates. "This is not folklore," he says, "but a scientifically based system of knowledge."

—Elyse Abbot



The Mayans. Also simpler and less than in foot size.



CONTINUUM



Giving blame where it's due: Analyzing oil to find its source could prove useful in determining the guilty party in future oil spills.

WHOSE OIL IS IT ANYWAY?

When gooey tar balls wash up on formerly pristine beaches, most people assume they're the result of yet another leak from an oil tanker or offshore oil well. Oil companies tend to deny responsibility for the oily mess. Now they can prove their innocence by delimiting the source of the suspect petroleum, which sometimes turns out to be the ocean floor, where crude oil seeps out when fault lines shift and rupture.

Early in 1990 a BP America tanker, American Trader, spilled 400,000 gallons of Alaskan crude off Huntington Beach, California. Thus BP received the blame for every tar ball that washed ashore on the West Coast. Using an isotopic technique known as isotope mass spectrometry, company geochemists established that many of the tar balls had come not from an Alaskan well but from a rift on the California ocean floor.

The specific proportions of carbon isotopes, paraffin,

sulfur, and other elements in oil vary, depending on the oil's origin. The differences show up in the ratio of carbon 13 to carbon 12 in a tar ball that has been converted into

its liquid state by adding some solvents.

Richard J. Drout, geo-science manager of BP's research center in Houston, says isotope mass spectrometry found "a very distinctive four parts per thousand difference between the oil from the American Trader and the oil from the ocean bottom near Huntington Beach. The composition of many of the tar balls closely resembled that of the ocean-bottom oil, proving that some of them occurred naturally. Thus BP wasn't wholly to blame.

The technique could be useful in assessing liability and financial responsibility in

IF THE SUN WERE THE SIZE OF A SOCCER BALL, THE EARTH WOULD BE THE SIZE OF A PEA.

A SINGLE GRAM OF GOLD CAN BE STRETCHED INTO A THREAD MORE THAN ONE MILE LONG.

future oil spills, he says.

—George Nisbba

"Adam was the only man who, when he said a good thing, knew that nobody had said it before him."

—Mark Twain

PECANS AND PLASTIC

What do pecan processors do with the 25 million pounds of nutshell left over each year? Until recently, nothing, but polymer chemists Ramaswamy G. Raj and B. V. Iyengar, who work at the Center for Pulp and Paper at the University of Quebec at

Three Rivers, have undoubtedly changed all that.

The scientists found that pecan shells ground into a flour can replace the unrecyclable filler substance, such as talc and glass fibers, used to strengthen plastic. Moreover, the fibrous structure of pecan shells actually binds more effectively with polymers than other fillers do. "Pecan

shells lend greater strength to plastic than most organic compounds," Raj says.

In tests, they found that the shell flour increased by 34 percent the tensile strength of high-density polyethylene, used in everything from milk containers to irrigation pipes. By contrast, a calcium carbonate filler raised it only 15 percent.

—George Nisbba



Waste not, want not: Two chemists have figured out what to do with the millions of pounds of pecan shells discarded each year—grind them up and put them in plastic.



The moment of discovery came not at the eyepiece of a great telescope under a canopy of stars, but in a small office at the Harvard-Smithsonian Center for Astrophysics (CFA) in Cambridge, Massachusetts. There late in the summer of 1985 University of Pine graduate student Wérie de Lapparent was plotting a series of points on a chart; the points collected with the help of a 60-inch telescope at Arizona's Mount Hopkins, represented the positions of galaxies in space. Analyzing the data was De Lapparent's thesis project, and if plotting all those points by hand was a little tedious, it was the kind of work graduate students are expected to do.

This time, the results were far from routine. As De Lapparent worked, she began to

see clumps of galaxies connected by arcs of galaxies, curving around huge empty places with no galaxies at all. At the center of the map there was a shape that looked like a stick man. Huchra's first thought was: *What did I do wrong?*

It remained to show the map to astrophysicist Margaret Geller. De Lapparent's thesis adviser and Huchra's partner in the latest survey of the galaxies Geller took one look at the map and understood that something extraordinary had occurred. She didn't know what the strange patterns meant, but she never doubted they were real. After decades of uncertainty, the structure of the nearby universe was at last revealed—and it was beyond imagining. The galaxies were arranged in amazingly thin, well-defined surfaces, wrapped around

GREAT WALL OF THE COSMOS

these something times. The galaxies weren't scattered randomly, as she had expected; instead, they made strange, distinct patterns on the page.

Unable to interpret what she saw, she went to CFA astronomer John Huchra, who had been chasing galaxies since the mid-Seventies and had helped collect most of the 1,065 data points on De Lapparent's map. A short, stocky man who often talks with an ironic smirk in the voice, Huchra is one of the world's most skilled telescopic observers: a master of the glass-and-metal giants and electronic black boxes that probe the universe. He was not having a good day. When she set the map down on his desk, he blanched.

The pattern on De Lapparent's map was like nothing Huchra had ever seen. There

enormous, bubble-like voids measuring up to 200 million light-years across. Later studies revealed one sheet of galaxies spanning more than half a billion light-years, making it the largest known structure in the universe. Astronomers christened it the Great Wall.

The findings raised questions of cosmic importance: How did these structures form? What could they tell us about the origin of the universe? Might the vast, mysterious spaces between the structures contain the stuff theorists call "dark matter" as yet undetected by scientists? In short, the bizarre bubbles and arcs revealed in De Lapparent's office represented perhaps the most profound cosmic unveiling since Edwin Hubble discovered galaxies beyond the Milky Way six decades before

ARTICLE BY
ANDREW CHAIKIN

ASTRONOMERS
MAPPING
THE UNIVERSE HAVE
REVEALED
A BIZARRE AND
SPLASHY
ARCHITECTURE OF
GIANT WALLS,
BUBBLES,
AND SWEEPING
ARCS

PHOTOGRAPH
BY DAVID MICHAEL
KENNEDY

WHEN MARGARET GELLER (BELOW) AND JOHN HUCHRA (PREVIOUS SPREAD) BEGAN THEIR SURVEY, THEY DIDN'T EXPECT SUCH BIZARRE PATTERNS.



It was Hubble the aloof, pipe-smoking master of the 100-inch telescope at Mount Wilson Observatory in California, who proved in 1923 that the so-called spiral nebulae were actually galaxies. Six years later he made an even more astonishing discovery: The galaxies appeared to be rushing away from us at fantastic speeds, as if fleeing a collection of unfathomable proportions. Hubble's observation was the first evidence that the universe was expanding in the wake of the fiery explosion that formed it—the Big Bang.

Based on his own limited survey of the heavens, Hubble believed that the galaxies—or "island universes," as some astronomers called them—were sprinkled fairly randomly and uniformly through space. By the Thirties, however, astronomers had learned that the notion was not entirely true. In some places, the galaxies were gathered together in clusters. Our own Milky Way galaxy, for instance, belongs to a collection dubbed the Local Group, which includes the famous Andromeda spiral and a score of lesser galaxies. In more remote realms, millions of light-years from Earth, galaxies congregated by the thousands in the Filiae, one maverick astronomer proposed that even the clusters were

grouped in larger assemblages, or "superclusters," spanning millions of light-years.

But what about on the largest scales? Might the clusters and superclusters be arranged according to some grand cosmic architecture? For most astronomers, Hubble's vision of a uniform universe still held sway. Even though clusters had been found, most scientists believed the universe would still look smooth—provided you stood back far enough.

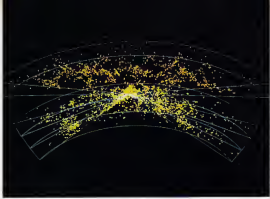
Half a century after Hubble that view endured among a new generation of astronomers. One was Princeton's James Peebles, who, in the early Seventies was single-handedly transforming cosmology. Until then most cosmologists hadn't asked how galaxies might be arranged in space. To them, only two questions were worth asking: How fast is the universe expanding? Will it expand forever? Those questions compelled Peebles, too, but he realized that astronomers would never answer them if they ignored the structure of the universe.

Peebles compared the universe to a boundless ocean. To an observer near the surface, swells and ripples—which Peebles compared to clusters and superclusters—were apparent, signaling the approach of turbulence or storms. But from afar

the waves were more or less regular, the ocean appeared smooth. "What fascinated me," Peebles now recalls, "was the thought that if we could understand the way that galaxies clumped, we might be able to understand how the universe came to be the way it is."

To Peebles the only way to divine the structure of the universe was with statistics. What are the odds that one galaxy exists near another? What are the odds that it will be a member of a cluster? Or a supercluster? The answers to such a cornucopia, Peebles believed, might help unravel a host of fundamental questions, from the origin of the galaxies to the fate of the universe itself. Peebles longed to test his theories, but to analyze the way galaxies cluster, he would have to know their true positions in space.

But simply charting the locations of galaxies as seen in the sky would not suffice. Visual observation, even with the help of science's most powerful telescopes, could never yield a flattened and misleading two-dimensional view. It would be like looking at the world with one eye closed. Foreground and background galaxies would be silhouetted on top of each other. The crucial third dimension—the galaxies' distance from Earth—would be missing.



The cosmic yardstick by which scientists could measure the third dimension in space had been discovered by Hubble himself. The useful phenomenon, known as redshift, occurs because the universe is expanding. As a result, remote galaxies continuously recede into the distance, fleeing farther and farther from the Milky Way with the motion of the expanding universe. This light from these galaxies thus appears to be stretched out—that is, longer in wavelength, or redder, than if otherwise would. Simply put, the farther a galaxy the greater its redshift. Up until recently, astronomers determined redshift by using photographic film to capture a galaxy's spectrum. The astronomers analyzed the spectrum and then, using a simple formula, determined the galaxy's distance from Earth.

But photographic films proved frustratingly inefficient for the task of soaking up light from distant galaxies. Even with the largest telescopes, it took hours to record the spectrum of a single galaxy. In the early Seventies, however, astronomers began replacing film with ultraviolet-sensitive electronic detectors that could register an individual photon—the smallest quantity of light—from a remote island universe. Using such a device, astronomers could trim a

night's work at the telescope to a fraction of an hour, making an extensive redshift survey feasible for the first time.

That opportunity was seized by a bright young CFA astronomer named Marc Davis, who began the first redshift survey in 1978. After struggling to get funds for the project, Davis had to build an electronic detector himself, painstakingly copying the design from a colleague in California. For a year Davis wrestled with the bulky device, but finally he and his collaborators were ready. Their goal: to survey as large a volume of space as possible, measuring the redshifts of a staggering 2,400 galaxies out to a distance of 300 million light-years. Three years later the first CFA redshift survey was complete.

As Davis talks it the project almost cost him his job. That was four years out of my life, to do that survey, he says. "I was an untrained professor and I ran into deep trouble, with the possibility of losing my job, because I wasn't publishing enough during the survey."

But the effort had paid off. Davis now had more than enough statistics to start analyzing how galaxies clump. In addition, the galaxies' positions could be plotted on a kind of crude map. When Davis did so, there were hints of cosmic archi-

ecture. Clumps and filaments, separated by empty places, seemed to emerge.

But Davis's map had relatively little impact on his colleagues. One reason, the sketchy nature of the picture, due to the widely scattered data points. "I remember sitting with Marc," Peebles says, "and Marc saying, 'Look at the filaments,' and my saying, 'Oh, give me a break!'"

Even as the scientist debated the reality of the structures on Davis's map, another redshift survey had turned up something extraordinary entirely by accident. CFA astronomer Robert Krashner, then at the University of Michigan, and three collaborators chose an apparently bright patch of sky in the constellation Bootes for their own redshift survey. Instead of a broad canvas, they chose to concentrate on several small regions, penetrating deep into space. Krashner compared it to sticking knitting needles into a pumpkin to see where the seeds were. To their great surprise, the pumpkin was empty. They had discovered a vast region nearly devoid of galaxies. Krashner still remembers their disbelief. "We thought, 'This is too weird.' A big hole in space that can't be right!" If the data proved correct, the void in Bootes was 217 million light-years deep, bigger than the en-

IN THESE TWO SURVEY "SLICES," EARTH IS AT THE LOWER VERTEX. THE FAR CURVED BOUNDARY IS 500 LIGHT-YEARS AWAY. EACH POINT REPRESENTS ONE GALAXY.

the volume covered by Davis' redshift survey. Kirshner's group was so started that they held off publishing the result for more than a year until they had a chance to gather confirming evidence. When they did announce the discovery in 1981, the news drew headlines in *The National Engineer* (DID A REAL LIFE STAR WARS CAUSE THE HOLE IN SPACE?) along with strong doubts from some astronomers: "They could accept the idea of small voids, since those had been predicted by computer simulations of galaxy formation. But no simulation had forecast the monster gulf in Bootes."

One of the skeptics was Margaret Geller. A former student of Peebles, Geller had recently returned to the CFA from England, where she had developed an interest in the large-scale structure of the universe. From the time she had been a graduate student in the male-club atmosphere of Princeton, Geller had felt like something of an outsider in professional astronomy. Unlike Peebles, she did not believe in surveying galaxies for the sake of statistics alone. "I just thought it was sort of boring if that's all there was to it," Geller says.

Geller was more interested in knowing whether oddities like the Bootes void existed at all. After all, such structures flew in the face of current theo-

ries about how the universe formed.

These theories derive, in part, from radio astronomers' studies of the most distant and ancient realms of the universe show a featureless wash of radio energy known as the microwave background. This uniform microwave background is thought to be the "echo of the Big Bang. But if the Big Bang had given rise to such a homogeneous universe—as reflected by the uniformity of the microwave background—how could one account for the enormous structures and holes? Geller was betting that the Bootes void, for one, didn't exist at all, that it was merely an illusion due to the sparseness of the data on Kirshner's map.

To settle the question once and for all, Geller and CFA colleague John Huchra decided to conduct a redshift survey of their own. There would be a truly herculean task, for they planned to survey 15,000 galaxies in the northern sky, extending 650 million light-years from Earth. As for the hands-on work, that fell to Huchra, who began the extensive task at the 80-inch telescope on Mount Hopkins in 1985. In his heart Huchra is not a theorist, and he did not share Geller's desire to pin down the large-scale structure question. "I didn't particularly care," he says. Being

undistracted by the whims of theory Huchra says, is part of his edge.

Tapping that technical edge again and again, Huchra spent dozens of nights searching out his remote targets, each one millions of miles too faint to be seen with the naked eye. For efficiency's sake, Huchra swept his telescope across one pre-shaped wedge of space at a time, hopping from one galaxy to the next. By sliding up the cosmos in this manner he and Geller would be able to detect interesting features before the survey was complete.

Graduate student Valère de Lapparent put in her share of nights at the 80-inch telescope as well, and by June the first slice, containing 1,057 galaxies, was complete. But Geller and Huchra did not hurry to analyze their data, mostly because they doubted they would find anything significant. Not until the end of the summer did they give the work to De Lapparent.

Geller still recalls the moment she first saw De Lapparent's map. "Valère showed it to me, and I recognized that there was something there. That evening Geller took the map home with her and she says, 'I understood what it had to mean.' The map revealed what almost no one had expected—that the galaxies were arranged in thin sheets wrapped around enormous voids, some of which were as big as the one in Bootes. To Geller, the pattern resembled soap bubbles in a kitchen sink, or perhaps a sponge. Although the exact nature of the structure would require detailed analyses, Geller turned from skeptic to believer overnight.

Later on, so did Peebles. "I remember looking at that map for the first time and saying, 'My God, there it is. What was before always on the hairy edge of believability became manifest.' This time, it was no illusion.

Each slice that Geller and Huchra added to the survey revealed new details: new surprises. In 1988 the team discovered a vast sheet containing thousands of galaxies and measuring more than a half-billion light-years across. Christened the Great Wall by astronomers, it is the largest known structure in the universe. What's more, because the Great Wall stretches to the limits of Geller and Huchra's map, its very existence suggests bigger structures still. If you think it mind-boggling, you're not alone. "Hundreds of millions or billions of light-years doesn't mean anything to me, either," admits Geller. "All I know is, that's real big."

But what does this strange cosmic architecture imply? Confronted with a spongy universe, some astronomers have suggested that the voids aren't empty





NOTHING ATTRACTS LIKE THE IMPORVED TASTE OF BOMBAY GIN.

 CRANBERRY BERRIES FROM MICHIGAN
  ANGELICA ROOT FROM SARAWAK
  JUNIPER BERRIES FROM ITALY
  CASSIA BARK FROM INDONÉSIA
  ALMONDS FROM INDONÉSIA
  LEMON PEEL FROM SPAIN
  ORANGE RIND FROM ITALY
  LICORICE FROM INDONÉSIA



at all but are instead filled with a mysterious, invisible substance called cold dark matter which had already been proposed as a kind of gravitational "glue" to hold galaxies and clusters of galaxies together. In fact, some theorists say that cold dark matter may account for more than 90 percent of the substance of the universe. If so, the galaxies are the market floors and jitters on the waves of the cosmic ocean. There's just one catch: Cold dark matter has yet to be discovered.

Another idea centers on the explosions that may have accompanied galaxy formation. Shock waves from these explosions would have plowed in to the surrounding gas and dust, compressing them into enormous bubble-shaped shells that would in turn give birth to more galaxies. In this way the galaxies would come to be distributed on the surfaces of huge bubbles.

Princeton's Jeremiah Ostriker, who originated the shock wave idea, now says the theory would barely account for bubbles the size of the ones in Geller and Huchra's survey. And if future surveys show they are even bigger voids are common, he says, astronomers will have to look for new theories to explain them. In fact, Ostriker says, the whole

subject is up for grabs. "There are models out there that can account for large-scale structure. Period."

Geller concurs. "My view also says...is that there is something missing in terms of what we understand. Even Peebles—who still believes that if you stand back far enough, the universe will turn out to be smooth—agrees." Clearly "Peebles says 'I have something to learn!'"

Meanwhile Geller and Huchra's portrait of the nearby universe grows each year. Today with 12,000 galaxies charted, their survey is a few years from completion, but another more extensive one is already in the works. "We're only at the beginning in this," Geller says. "I like to say that the fraction of the universe we've mapped is like the fraction of the earth that's covered by Rhode Island."

Like a 20th-century maverick mapmaker charting the New World, Geller is only too aware of the unanswered questions. What kind of structures are these? Are they typical? How big are they? How did they form? What do they tell us about the origin of the universe? To that end, astronomers have embarked on an age of cosmic mapping. Other surveys have already begun to chart gal-

axies in the southern sky and have turned up a similar frothy architecture. In the future, astronomers aim to complete the mapping of the nearby universe and then begin probing more distant realms in hopes of learning what structures may have existed closer to the time the universe formed.

One of the most ambitious surveys is planned by a consortium from Princeton, Chicago's Institute for Advanced Study, and Fermilab. Using a specially built 100-inch telescope and a new kind of spectrograph that can image hundreds of redshifts at a time, they hope to survey up to an astounding 5,000 galaxies a night and a million galaxies by the turn of the century.

Even then Geller cautions: "don't expect the big questions to be answered right away." Understanding comes a bit more slowly than discovery.

Answers may come slowly, but they will come. Having charted our own little planet and some of the other worlds that populate our little corner of the universe, we are at last reaching out to fill in the big picture, to transform the cosmos into lensed cognate. And though the work is painstaking and long, the results will be as wonderful and awesome as the starry sky. **CC**

FORUM

CONTINUED FROM PAGE 13

out on a funeral pyre, dressed in a yellow sari, with an array of flowers scattered over her. They cast the flowers upon the water, anointed her with oil. After dipping water from the river and pouring it into her mouth, they set the pyre on fire. I heard the sizzle of burning flesh, a stench filled my nostrils. Flooding the scene, I rented a boat, went out on the river and dove into the water. I write "Death" looks over my mourning, grief and asks, "And then what?"

By now, you know I'm in over my head. Am I the only one? Ask people to peel the layers of the word "God" and I'm not sure you'd find many who agree on the who and the what, kindly professor, grandfathers, loving and compassionate, learned, wise, judicious, shamanism, trance states, deep ecology, Allah, Buddha, Christ, I say "God" and stones from the Old Testament pop

up—wanderings, odes, lamentations, an ark, a rainbow, and promised rest. These are deeply ingrained images that continue to resonate with emotion, though the original meaning has lost its powerful hold.

Wittgenstein wrote: "Doubting and non-doubting behavior. There is a first only if there is a second." I doubt, but I didn't always doubt. The son of devout missionaries who spent 45 years in Africa, I was well versed in non-doubting behavior. I knew God, and my "knowing" was not just a passive acceptance of a dogma or creed. God provided a framework out of which I made sense of my life, a safety net to catch me if I lost my balance.

One day I fell and the net didn't hold me. What happens when a person loses a belief, something that's just as integral to his identity as is the powerful and formative reflection of the mirror image? For starters, a free fall, and a bunch of dark, anxious days. One thing for certain: The person is haunted by the idea of meaning, if it always there, gnawing, undulating like a hungry dog waiting to be fed.

When I took on this assignment "Wearing" hovered in his buddies for reinforcement, assuming with only a

pair of trousers, he'd trump me. He did. Louie, I guess. Evil, death and meaning, our Latin church fathers would have said, complex oppositions. For better or for worse, I can't talk about God without facing the gang of three. That may not be your lot or the way you'd pluck the bird. Probably isn't. Perhaps I should have heeded the proverb and left the thing in its feathers.

"Evil" may await his eyes once in a while, but "Death" wears a terrible grin. And "Meaning" needs what I've written and laughs in response. I point to a plate that sits on the kitchen cabinet in the center, a young peasant bends toward the ground, with two words in one hand. Printed above him: *LES SAS DE US8 PORTER 1987*. "I lay down my arms." That's as far as I can go now with God. Much less the figure of God. Love, job. I say "I put my hand over my mouth." Logic, once, but I have no answer—twice, but I will say no more. (Job 40-41) Wittgenstein: "There are indeed things that cannot be put into words. They make themselves manifest. They are what is mystical. We don't get to the bottom of things, but reach a point where we can go no further, where we cannot ask further questions." **CC**



Can science reach beyond physical reality
and prove that a divine being or force oversees the universe?

GOD

THE
MIND
OF

GOD

In John Updike's novel *Roger's Version*, a computer hacker claims that scientific calculations will soon prove the existence of God. Scientists in the real world are less confident. Even as the idea of God gains newfound respectability in some scientific circles, many scientists argue that finding God remains outside the realm of science. A few, however, believe that

science can produce questionable, scientific evidence of God. And one bold physical asserts he has already laid the theoretical groundwork.

While science and religion both seek ultimate truth, they conduct the search through means that seem to oppose each other. Theologians rely on divine revelations—or intuitive discoveries. If no one can disprove the insights and answers to religious questions, then they must be true. But divine revelations, in and of themselves, do not prove the existence of God, which is not a point of contention in religious circles.

Scientists require proof, physical evidence that supports a belief. An experiment, performed anytime, anywhere, should produce the same results. Despite the demand for evidence, however, science evokes its own faith, or assumptions, which scientists justify by saying that they must start somewhere. If the rate of reaction in stellar fusion, for example, were just a tiny bit different, then carbon would be extremely rare. Most scientists agree that complicated molecules require carbon and without carbon, they believe life as we know it—and as we don't know it—could not exist in the universe. "This seems to make the universe fine-tuned to our existence," says astrophysicist

Thomas McDonough, now a Catech lecturer in engineering. "Some scientists would say this is a signpost that God does exist."

Signposts do not constitute proof, and most scientists stop short of claiming that any scientific principle or discovery proves the existence of God. Lack of evidence doesn't mean God does not exist, and scientists, of course, will never be able to disprove the existence of God. "Science can never prove a negative," says Johns Hopkins University neurophysiologist Vernon Mountcastle. "No scientist who's ever thought about the question would presume to say, 'I can prove that God does not exist.' It would be extremely arrogant of any scientist to say that science is a tool for discovering God."

Many scientists both agree and disagree with Mountcastle. "I can say there is no God, and in fact, there are visible, nonphysical pink elephants that certainly exist on us," says neuroscientist Michael Persinger at Laurentian University in Ontario. "You may not like it or believe it. But if I ask you to prove to me that they are not there, you can't."

But as Tulane University mathematical physicist Frank Tipler puts it, "Science concerns itself with the totality of

existence. If science can't reach God, then God doesn't exist."

In the absence of physical evidence, belief in the existence of God must rest upon faith. Regardless of their own personal ideas about God, however, scientists—believers, atheists, and agnostics alike—commonly use God as a metaphor in their research. "We often try to understand how we would build the universe if we were God," McDonough says. "Physicists, for example, would approach the idea by creating basic laws and observing what happens when they let those laws operate. Looking at the fundamental equation $E=mc^2$, we ask, 'Why would energy and mass be related in this strange way? Why would God make the speed of light constant everywhere in the universe?' Even those scientists who do not believe in God find it useful to think that way, which is not very different from the way a theologian thinks."

A proposal for an actual research project to seek God, scientists agree, would receive little encouragement. "You just don't get funding to go out and find God," says Stanford University psychologist Stephen LaBerge. "Even if you did, you'd have to first define what you mean by God." And every major religion vows God in a different way, creating what often seems to be many Gods, rather than one. In Western societies, moreover, God also means something different to each individual believer, who often perceives the personal God in some kind of physical form, rather than something that transcends physical reality.

Scientists seeking God as a unifying force in the universe would likewise design their research projects according to their own metaphor for God. They generally shy away from any public statement regarding their own beliefs about God because most people would assume they are talking about a physical being resembling the white-haired old man Michelangelo depicted.

According to Tipler, however, "Nature will tell us what sort of definition we have to use" in determining a search for God. "Masters of science are not open to opinion," he says. "In principle, there could be a difference of opinion on water, but water is water and there is only one reality."

The greatest obstacle to a search for God, in fact, is "putting the idea on the table and simply acknowledging that it is a legitimate topic for conversation," says physician Larry Dossey, former chief of staff at Medical City Dallas Hospital and author of *Recovering the Soul: A Scientific and Spiritual Search* (Bantam, 1988) and *Meaning and Mid-*



some (Bartem Fall 1991). Before anyone can instate a God search, scientists need to be receptive to the idea and be willing to accept whatever evidence is collected. It's not scientific heresy or blasphemy to waffle on indirect evidence. No one has ever held a quark in his hands. The same reasoning can be applied to God. But if we start out saying we have no God meter, whatever evidence we get will be indirect and we'll be in a better position to handle whatever phenomenon we observe.

Neuroscientist Karl Pribram at Virginia's Radford University argues that not entering the subject of God into a serious scientific debate is ironic. "As you grow older, there are two ways of doing science. One way is to go back to the questions that got you involved in science in the first place, which requires you to deal with the question of God. The other way is to learn more and more about less and less, which means you become an expert in a particular area and, at that point, you don't want to be bothered and, in fact, probably think it's pretty stupid to ponder questions about God."

Discussions about God enter the area of metaphysics—what lies beyond the physical world but underpins or guar-

antees the physical world order. "While we assume there is a design behind the physical reality, science can't really tell us anything about the design or the nature of God, or God's relationship with human beings," says Paul Davies, professor of mathematics and physics at Australia's University of Adelaide and author of *God and the New Physics* (Simon & Schuster). "The physical universe reflects the rational nature of the creator, and scientists uncover the rational structure, which some say is seeing the mind of God."

Yet scientists exploring the mind of God are indirectly, if perhaps unconsciously, seeking the body that incorporates that mind. Any physicist, for example, interested in ultimate questions is on a search for God or conclusive physical proof that God does not exist. And any search for God requires the scientific personality.

"The type of person who becomes a scientist is inherently a doubting Thomas," McDonough says. "If you can tolerate doubt and uncertainty or can turn to your religious faith, you become a politician, or a priest or rabbi, or almost anything else. If you always want answers supported by hard proof, you become a scientist, essentially questioning authority and never completely trust-

ing another scientist.

It's difficult to study the birth of the universe and not ponder questions of intent. Even in Western science, which logically reduces everything to basic elements, many scientists' thoughts inevitably turn to the existence of a supreme universal being. "I'm surprised by how many of my colleagues are, in fact, religious and hold very conventional religious beliefs," Davies says. "In some cases, their scientific work bolsters their conventional religious positions. The majority, however, probably stand in awe of nature and aren't sure whether its subtlety and ingenuity relate to a personal God or simply an underlying order. Yet even they feel the world is more than a random accident. There has to be more to it than just fact."

Western scientists' materialism, the view that everything is composed exclusively of physical qualities in space and time, clearly complicates any scientific search for a nonphysical God existing beyond space and time. Until the seventeenth century, Western scientists, like everyone else, accepted the existence of God as a fact. Then René Descartes, Sir Isaac Newton, and others seeking mathematical and scientific truths began unraveling the mechanics of gravity and other laws of nature. In the process, they explained many of the things that had been accepted as God's handwork.

But they steered clear of God and the soul. And that has a lot to do with Descartes and the deal he made with the Catholic Church, says neurochemist Candace Pert, research director at Integrus in Beltsville, Maryland. "In exchange for permission to dissect human bodies, Descartes agreed to stay away from the study of the soul and the mind, which was the Church's turf. Ever since, scientists have considered soul a four-letter word, something that's not studiable."

Scientists may have consciously tried to drop the subject of God from their inquiries, but even Newton thought in terms of God causing the planets to move in the particular way they do. Seventeenth-century scientists didn't think of the laws of nature as models in the human mind, but human discoveries of the fundamental reality of nature," Davies says. "They believed God was a mathematician and that the laws of nature were eternal laws or ideas in the mind of God."

The idea that the laws of nature are eternal still guides scientists, informing the belief that the laws of nature must govern all of nature. But if the laws of nature are eternal, where were they before the creation of the universe? Even



in one's most optimistic moments, questions like that seem to be unanswerable and are clearly outside the realm of science," says MIT professor of physics Alan Guth. "There are limitations on what kinds of questions you can scientifically approach. Asking the purpose of the universe is an unscientific question. There might be an answer, but it won't be a scientific one."

Most scientists and theologians share the same dilemma when addressing the ultimate origin of everything. "If you argue that God created the Big Bang," McDonough says, "I'd respond, 'What created God?' No matter what direction you follow, you come back to the giant cosmic question mark. You can't know what came before the beginning, before the Big Bang or before God. It's not clear that we will ever know the answer."

Indeed, attempting to scientifically answer such questions would expose the metaphysical foundation of science, according to British biologist Rupert Sheldrake, author of *The Aether of Nature: The Questioning of Science and God* (Bantam). Those who think about the origin of the laws of nature must conclude that the laws governing the crystallization of salt and the migration of swallows exist outside space and time and were therefore in place at the time of the Big Bang. But there's no way to test that assumption. It's an act of faith, a relic of the theological legacy on which science is founded. There's a lot of theological assumptions in hard-nosed orthodox science.

Sheldrake hypothesizes that the laws of nature, in fact, are not fixed but evolve along with nature. The regularities found in nature are more like an accumulation of habits. "That requires a different understanding of cosmic evolution, the development of nature, and hence of God," Sheldrake says. "A different kind of God, a mechanistic God or an engineering God with a mathematical inspiration."

And a different kind of science, one that openly incorporates the physical and the metaphysical. "Scientists can only study what they have the tools to study," Pert says. "If the hypothesis that God is a spiritual energy is true—and it is my personal belief that it is—then, yes, it is theoretically possible to use the scientific method to prove the existence of God. But we will have to first understand the other realm of spiritual energy, which science hasn't yet addressed, although it appears that we are definitely heading in that direction."

Integrating spiritual energy and physical reality, however, "would be a catastrophe that would destroy the body

of science, the structure of cause and effect," says physicist Robert Jastrow, Dartmouth College professor of earth science and author of *God and the Astronomers* (Norton, 1978). "Science has a useful set of insights and they depend on the rigorous adherence to fact and inferential reasoning. It has a certain power. It also has a certain narrowness because it cannot illuminate the larger questions of beginning, end, and purpose. If you try to break the structure of cause and effect, then you have nothing, not good philosophy, not good metaphysics, not good science."

It clearly won't be easy to unify the way scientists think and conduct their endeavors in the search for God. "To apprehend a nonphysical God existing outside space and time, you have to expand, not reduce, everything to its basic elements," Dasey says. "Efforts to understand the concept of God have ig-

● The search for God will herald the dawn of the twenty-first century, and physical evidence will alter our view of God, but we must redefine God in terms of physics. ●

nored what we know about the nonlocal nature of the mind [flowing throughout the body in a network of information molecules]. If you're nonlocal, you're omnipresent and infinite in space and time. If you're infinite in space and time, then you're eternal and eternal. These are the same qualities that we have always ascribed to God. And the idea of nonlocality will provide science with the proof of God's existence. The initiation of an actual search for that proof, however, will herald the dawn of the twenty-first century, according to Tulane's Frank Tipler, whose Omega Point theory provides the basis for calculating the experiments. "Physical evidence could greatly alter our view of God, but we need to redefine God in terms of physics, which won't be easy," he says.

Unlike Freeman Dyson's theory that life goes on forever in an open-ended universe, Tipler believes that eternal life can exist only within a closed universe. And eternal life generates God, not the other way around. God evolves

as the universe evolves. "If that's true, we will be able to determine how God then generates the universe," he says. "I must warn you that I'm pushing physical laws far beyond where they've been tested. It's crazy, but maybe not crazy enough to be right."

According to Tipler's Omega Point theory, the entire cosmos will eventually be united in the mathematical equivalent of the sum of all points in space and time. Essentially at the end of history, billions of years from now, Tipler says, "We will evolve to its ultimate future—the Omega Point [GoD], the point of infinite knowledge [omniscience] and occupation and control of the universe [omnipresence and omnipotence]. Nothing more can happen."

It's a physical theory based on scientific materialism in physical cosmology and computer science, not on religious revelations, but the implications increasingly lead back to the traditional image of God, he says. "Wherever you talk about eternal life and the evolution of the universe, it's impossible to avoid God. It's an automatic consequence, whether you do it my way or some other way."

But Persinger, for one, doesn't believe the answers lie in the cosmos, but in the human brain. "No matter how wide we assume the universe is, no matter how old we presume it to be, everything is contingent on the experience of human beings," he says. Indeed, Persinger views God as a concept that resides in the brain, a product of evolution and brain function that reduces anxiety about death and self-dissolution. "The whole issue of God's existence can be evaluated effectively by using neuroscience tools to study how the brain works and what its function provokes or induces," he says. His argument, however, begins with the premise that God does not actually exist.

Science and theology deal in complementary ways with the mysteries of the universe. As Einstein said, "Religion without science is blind. Science without religion is lame." And as we approach the twenty-first century, scientists and theologians agree, we are entering new dimensions in our understanding of God. But science will not change the relationship between believers and their God. "For believers," says Richard Mouw, professor of Christian philosophy at Fuller Theological Seminary in Pasadena, "science will always be trying to unpack divine mysteries and filling in information that for us simply confirms our belief that God has created a marvelously complex universe and, indeed, marvelously complex human beings. ☐



ARTICLE BY KENNETH R. HEY

TECHNO-WIZARDS & COUCH POTATOES

Techno-outsiders are being denied the very things our society cherishes—equal voice, opportunity, and access

PHOTOGRAPHS BY PETE TURNER

Many Americans felt comfortable, even satisfied, with television images of coalition forces using the latest techno-wizardry to send missiles to their precise targets on the ground in Iraq and Kuwait. While many of the world's citizens marveled at the technology, however, others worried about the extent of destruction and the way in which technologically advanced countries have acquired the capability to destroy more traditional (i.e., less technologically advanced) societies. Iraq's tenuous infrastructure collapsed under relentless coalition bombing. Water, energy, transportation, and communications systems all fell victim to the 100,000-plus sorties. In short, a nascent industrial society became a preindustrial society within 60 days. Because of the chasm between

the advanced and less advanced countries, morally tinged words like *should* have become intermixed with technologically confident words like *can*.

The difference between *can* and *should* measures the distance between technology and ethics, between reality and ideal. The reality is that technology has created a huge gap between techno-literate and techno-illiterate, between those who can ride the technological wave to financial rewards and those who must remain outside its direct influence. This reality flies in the face of society's ideal of equal voice, equal opportunity, equal influence, equal access. While the reality-ideal split has always existed, the advent of high-tech instrumentation has accelerated the pace of dislocation.

Altered states: The invisible touch of digital technology has furnished publishers with the ultimate photo opportunity—to reinvent history

Every eight years, modern technology doubles the amount of information in print, and that doubling period is shrinking. So much information pile pressure on content and structure. Within society, education offers the context and structure. Writers like Robert B. Reich and Alvin and Heidi Toffler are of the opinion that those with the context, not the labor, will enjoy the benefits of tomorrow's wealth. But the future need not be considered for that assessment; the disparity is already here, and the gap between techno-literate and techno-illiterate has grown expansive in the past ten years.

A simple definition of literacy might call it the ability to code and decode information using a socially shared symbol system. If the English language is the shared symbol system, roughly 90 million adult Americans are illiterate or semiliterate. Add the annual 20 percent high-school dropout rate, which skyrockets to 50 percent in certain inner-city areas, and it becomes clear that a burgeoning portion of the U.S. population lives as techno-outsiders.

If mathematics is the shared symbol

system, more Americans join the outsiders. For example, in 1985 the Educational Testing Service (ETS) surveyed 54,000 students in grades three, seven, and eleven. It discovered that roughly half the seventeen-year-olds could not correctly answer multiple-choice questions involving percentages or square footage, even when listed answers allowed for huge errors. If the shared symbol system is computer language, virtually 90 percent of the population crosses the line into illiteracy.

"The gap between the people designing technology," according to David Kelley, a Palo Alto, California, product designer, "and those who buy it just

they cannot participate in its culture.

While this nagging democratic concern whirrs around high-tech advances, another problem involves the fact that the systems the educated elite controls are offering more opportunities for abuse and are themselves becoming less reliable. Digitization of information—the breakdown of all input into binary digital signals, 0 and 1, and its recomposition at some other time from digital signals back to its original form—makes each electronic signal (i.e., each 0 or 1) discrete and changeable without a trace. This has created a huge potential to accumulate, assess, and transmit data, but it has also created an equally huge potential for abuse.

Some people, like computer "hackers," actually seek to undermine operations. These new-era Billy the Kids create computer viruses—rogue computer instructions that undermine a program's objectives and can harm hardware. Viruses threaten the veracity of information ranging from monthly bank statements to onboard radar and guidance systems. The recently "liberated" Bulgarians have become one of the leading exporters of computer viruses. Hackers in one Bulgarian organization "launch" one computer virus every seven minutes. Not only is the group prolific but it evidently has excellent quality control. "Dark Avenger," one of the group's best-known viruses, has already surfaced in the Soviet Union, Czechoslovakia, Poland, Hungary and the United States (in military systems).

Peter Tippett, a computer virus consultant, reveals that in his own study of 150 large U.S. companies, half admitted to having "caught" a virus and 26 percent of them suffered infections between January and March 1991. Tippett projects from these figures that by the end of 1991, virtually all heavy computer users will have faced a virus of some kind or another.

Viruses reproduce themselves and spread their infection to computers in contact with the original contaminated computer. Identifying this attribute as a potential strength, Western military analysts and freelance terrorists alike have initiated efforts to make rogue viruses do electronically what grenades and bombs do physically. Military strategists, according to the German newspaper *Süddeutsche Zeitung*, based in Munich, are seeking ways to infect smaller systems like those steered combat air-



keeps getting bigger and bigger." Computer users who are comfortable with Windows, Lotus 1-2-3, or some other sophisticated software are literate in computer utilization, if not computer programming language. Kelley suggests that the gap between the user-literate group and the designer group is expanding rapidly.

However, the gap becomes a huge chasm when the measure is between those techno-missions designing the technology and those who do not use it or do not understand it at all. In some graduate schools, computer languages can substitute for a foreign language in Ph.D. programs. For the great majority of Americans, computers and related digital technology are a foreign language; they have no access to its meaning and

Left: Author Kenneth R. Hay





First there was the shield in the desert, then the storm. Now it's the smoke. The aftermath of the Gulf War, as in all wars, is a tragedy of lives lost and land ruined.

This time, however, victor and vanquished were playing in a most dangerous environment for the carelessness of combat: the fragile desert ecosystem and rich oil fields of the Middle East. The results will long outlive the battle. Withdrawing Iraqi soldiers left between 500

and 600 Kuwaiti wells ablaze. By early June, hell fighters had successfully capped about 100 burning wells. Experts say the rest of the task may take another two years.

Meanwhile the tarry plume, a tanned leather in Saddam's cap, darkens much of Kuwait's skies. On many days the smoke turns day into night, forcing drivers to use their headlights.

How bad is it? Some 4 to 6 million barrels of oil are going up in smoke

each day—a figure equal to about one-third of the daily U.S. consumption and one-tenth the world's daily dose. The smoke spews perhaps 50,000 tons of sulfur dioxide into the air each day and has sent hundreds of people to hospitals with respiratory ailments.

According to some estimates, Kuwait's oil fires are raising the carbon dioxide pumped into the global atmosphere by approximately 2 percent. Though these

PHOTOGRAPHS BY
PETER MENZEL

A man-made inferno blackens
the future of the Mideast

BACKDRAFT

TEXT BY BETH HOWARD



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emissions will stop when the fires are extinguished, the globe-warming gas will be with us for another 100 years.

Experts, however, may have a more pressing concern: how the fires' fumes will alter the immediate weather forecast. They could disrupt Southeast Asia's monsoon season, unleashing a drought affecting billions of people. Even if rains do come, they may be accompanied with soot as to make the land barren. Others fear that the clouds, already lowering ground temperatures by some 15° to 30° F, could trigger a small-scale nuclear winter in the Middle East. Still other scientists treat such worst-case scenarios with skepticism. As reported in the May issue of *Nature*, researchers using satellite data predicted that the smoke would not rise higher than 5.5 miles and would be quickly washed out of the air. At press time, U.S. agencies had arrived on the scene to survey the damage and monitor levels of sulfur dioxide, hydrogen sulfide, and carbonyl sulfide in the plume. While scientists study and debate the effect of the oil well fires, the Kuwaiti people struggle to carry on their lives under the pall of smoke. Although they have been liberated from occupying Iraqi troops, now they are under siege by an equally menacing force. **DD**



EXPERTS SAY IT MAY BE ANOTHER TWO YEARS BEFORE THE FIRES PLAGUING KUWAIT ARE FINALLY EXTINGUISHED.



TEMPERATURES ON THE GROUND HAVE DROPPED BY 30 DEGREES, TRIGGERING FEARS OF A SMALL NUCLEAR WINTER.

"The loss of self is the loss of God," says the author of *The Reenchantment of the World*, who searches for a new order of self/body in time and place—a new cosmology

INTERVIEW

MORRIS BERMAN

It is risky sometimes to gather your friends together and introduce them to each other. You never know, really, whether they'll like each other, take to each other, see what you see in them. I've met someone that I'd like you to get to know, a gentle-mannered man who says the craziest things, troublesome, delightful, even controversial. His name is Morris Berman. He loves big ideas, he also loves Fette's Amaro and swing dances at night. Morris hangs out and writes—ountain pen, yellow pad—at the Honey Bear Café, in Seattle, and along the way has collected degrees in mathematics (Cornell) and the history of science (Johns Hopkins). After a number of teaching stints, he gave up the "tenure track" for a life as a "freelance" professor, writer, and lecturer.

A number of years ago I stumbled across his book *The*

Reenchantment of the World. It was a wonderful moment, but then he disappeared from print. Recently he's resurfaced with another book called *Coming to Our Senses*. The friendship was immediately rekindled. Last March we connected over a cappuccino—that's me—and a cup of herbal tea—that's him—in Seattle. He'd given up coffee some time before. No small feat, particularly in a town that prides itself on consuming more coffee than the Italians do.

Why do I think it's important for you to meet him? Because he's a "cultural historian," a "social critic"? Not really, though his analyses of Western civilization—read our lives—is provocative and challenging. He gave me the opportunity to sit down and think and feel—"invert" I don't usually mark on my desk calendar those days. There's a decent enough reason to meet him, whether you and I believe or

PHOTOGRAPHS BY ALAN ABRAMOWITZ



The current collapse of idealistic society may well be the planet's way of avoiding a larger death.

Modern men and women are less autonomous and more desperate for solutions than their counterparts were at other times in history.

The body gets left behind by an entire generation mesmerized by video games.

I am convinced that the major historiographical revolution is yet to come.

If a cross on the wall shouts believers of goatee spiritual experience, it lets them lead a "happy," programmed life.

After dreaming that the celestials in his private menagerie were planning to eat him, Henry III of France personally killed them all, on January 20, 1583.

It is clear that psychic distance must now be abandoned as the criteria of truth.

When was the last time you observed yourself in the act of dusting the dining room table?

When you've lost your body, you seed on him.

We each owe mythology, our own real possibilities to live out; we owe each our own central metaphor.

Can you recall your first conscious moment? Can you recall how old you were when it occurred?

Scientific detachment is driven by a very definite amnesia—the craving for psychological and existential security.

anything he says is irrelevant. How often do we completely agree with our friends anyway?

Before you meet him, though, you may need a piece of information, a small window through which you can look at Morris Berman. His maternal grandfather is a Russian aristocrat whose conscription into the czar's army. He reached London in time to watch Queen Victoria pass through the streets on her diamond jubilee, before emigrating to Rochester, New York. The contrast between the sheltered gentry life of nineteenth century czarist Russia and the New World overwhelmed him. "The rest of his life," Berman says, "became a wrestling match between the world of the short—closed but safe—and the larger world—startling but sometimes dangerous."

Berman loved his grandfather. What did he produce in a society that judges everything by productivity? Berman asks. "Bupkis! Nothing! But I was given a great gift. I grew up with a truly great and loving man." Berman says he inherited his grandfather's dis-

logue between reason and revelation, the sacred and the secular. "Whatever is symbolized by the phrase 'The truth will make you free' is encoded in my genetic history. Ignorance is not bliss; it is better to know than not know."

If you get what he's saying, you'll understand why he asks the questions he asks, and you can follow him into the strange and wonderful world of epistemology. How do we know what we know? What does it mean to know, anyway? Is reality nothing more than a cultural artifact? How do we choose our value systems? Why do we need worldviews, paradigms? People like Morris Berman aren't out to offend. But if you're in pursuit of the "truth," you don't usually bow before cultural norms or cherished beliefs, religious or political. Sometimes these people trouble our easy sleep.

We meet each other in various circumstances and ways—a life help from our friends, chance encounters, deliberate scheming, and sometimes, through a person's words, the ages.

It's odd, Morris Berman's just talking history, but because he talks about what he calls "societal history," you sense he pres-

ence among the words, he evokes feelings. It's very nice. So as you read or gauge the fringe in your gut, check out your level of curiosity or restlessness, realize: When you're smiling or frowning your brow, hear the proclamation, the "Wow"; notice what your body is telling you. If you get restless, it's okay. Restlessness, Berman says, is the body's way of flashing an essential message. This is a punch, don't ignore it. For one, never get restless. I just "got" curious—all over, like a case of goose bumps—Murray Cox

Owens: Today's Good Friday is a day when Christians remember the death of Christ. Berman: Oh, yes, this issue of Omni is on the future of God. You really should be interviewing Nietzsche. Owens: Well, sure. But let me see anyway. You say that ancient theology is embodied in the consciousness and religious structure of the West. Berman: Yes, it codes our perceptual reality—everything from architecture to moon voyages. The code is always vertical. The easiest way to under-

stand the ascent phenomenon is to look at the differences between the Eastern and Western mystical traditions. Zen masters say there are no hidden meanings. What you see is what you get. Sufis is content. Chopping wood, carrying water, drinking espresso—such activities are "God." Western religious practitioners, however, claim there is a hidden meaning—most often called God—and the point of religious activity is to contact what is behind the appearances. We inherited a set of Gothic ballads which tell us that at birth, the soul gets trapped in a material body but yearns for higher consciousness. Through various techniques, the soul can escape the body, ascend to the heavens, and see God the Father on the throne.

Western Chronology is based on a reckoner who ascends and descends, moving up and down the vertical axis. It's the vertical experience that codes Western reality. Look at any intellectual scheme—Marxism, Platonism, Christianity—there's always a hid-

The above quotes are excerpted from *Contingency: Our Selves, Berman & Schuster* (1989) by Morris Berman

den reality in which the things on the surface are explained by the things beneath. Ascent is based on a hierarchical model. A spiritual elite has "been there" and knows how to get the rest of us up the ladder. Even our political structure is based on a guru mentality. In that sense, Thomas Jefferson has to be the greatest breakthrough in the history of the world: "All men are created equal"—and women, too.

Omn: Why are we propelled to search for God?

Berman: For complex reasons that come out of the experiences of childhood: the damage to the self, and the shift from the kinesthetic to the visual. Much mystical experience comes from early childhood damage and is motivated by the desire to fill a void. British psychologist Donald Winnicott and French scholars, including Jacques Lacan and philosopher Merleau-Ponty, claim that the most traumatic event in life is the moment I become aware, usually in the third year of life, of my specular or mirror image and realize that that image is what people mean when they say "Maury Berman." Before this overwhelming discovery, all of us feel one with the external environment. Afterward there is a war in the fabric. I am "in here" and "that" is "out there."

The event is traumatic because you realize you can be an other for other others, you can be interpreted from the outside in a way inimical or antagonistic to the way you experience yourself. It's the beginning of alienation. To make up for that early damage—and there's more damage than just the realization in front of the mirror—we try to grasp the mirror image as real and begin to search for God, usually in a series of substitute satisfactions: addictions to alcohol, career, fame, whatever ideologies,isms, wars, are all attempts to find "God" in things that finally will not deliver: will not alleviate the emptiness. To me, loss of the self is loss of God, and we spend most of our lives chasing it. There's a line from one of Theodore Roethlisberger's poems: "Running from God is the longest race of all." I'd say running toward God is the longest race of all. They're the same thing. And yet, this running may not be necessary.

Omn: How is the split between Self and Other played out in our lives?

Berman: The Gulf War is the latest manifestation of this tragedy. That eighty-seven percent of our population backed President Bush shows that he is America writ large, and our pain and alienation is at least eighty-seven percent widespread. Thirteen percent of

the people may be saying, "There may be a greater strength than just pursuing binary opposition in order to overcome my internal split." But why did we get so excited over this particular divination? America, Bush told us, stands for freedom and justice, we will not condone naked aggression. Most Americans apparently bought that version. Marxists argued, the real issue is oil, that if Kuwait had been a major exporter of broccoli, we wouldn't have spent five minutes defending the place. A third explanation is the conspiracy theory. Bush faced problems at home he couldn't solve: the S & L bailout which is going to cost a fortune, the infatuation which was distancing us from Israel and becoming increasingly embarrassing the environmental problem and the decay of our cities. So the administration diverted our attention by creating an enemy. It's the Falklands War revisited, when Thatcher waved the banner of the Great Commonwealth, which, of course, no longer existed.

My take: The war was basically unconscious. We live in a world of early childhood damage of which George Bush is probably an excellent representative. Look at his stiff body language, his mechanical behavior. He got elected because he echoes our body language. When the opportunity arises to forget about our internal damage, we embrace it. The ego, in order to maintain its integrity and identity, has to have an enemy, so it becomes like a heat-seeking missile. After glasnost we lost our enemy of forty years: the Soviet Union. For a few months, we talked about giving money to art or medicine or education, we floated around in ambiguity but finally couldn't handle it. If we can understand our inability to tolerate ambiguity and the fact that the ego must have an enemy in order to feel whole, then this war is completely explicable. We would have fought Ghana, Antarctica, it doesn't really matter. We had to find an enemy. Of course, Saddam Hussein was a perfect target.

What emerges as strength in this culture? The person who wages peace or lives without heroism? No. Just the opposite. Watch the body language of our elected officials. It's wonderful—I mean sad but wonderful. When George Bush announced that we were going to war, *The New York Times* declared "A somber President Bush... Somber?" He was giddy. There's a pathetic quality to our heroism, and eighty-seven percent of the country apparently thinks that's what strength is about. **Omn:** Historically, has the ego always needed an enemy?

CONTINUED ON PAGE 66





FICTION



BY JACK DANN

TO
MOST OF US,
DEATH
WAITS DARK AND
MYSTERIOUS
IN THE FUTURE, BUT
IF YOU
COULD TALK TO
SPIRITS,
YOU MIGHT FIND
DEATH IS
NOT SO SCARY
AFTER ALL

DRAWINGS
BY RALPH CIGLIERE

VOICES

I was carefully papering the balsawood wing struts of my scale-model Gotha G V bomber when Crocker asked me if I ever spoke to dead people.

Although Crocker is a member of the Susquehanna River Model-makers and Sea Friends Association (which doesn't say much because all you have to do to become a member is hang out in the shack by the river and make model ships), everybody thinks he's right off his nut. One of the guys nicknamed him Crock-a-shit because of all the stupid stories he told—and the stupid questions he asked—and the rattle shack, well, he seemed to fix it. But nobody broke his arms or his legs or smashed up his models, and so he stayed on, sort of like a mascot. He was fat, freckled, and wore his white-blond hair in a brush cut. But he was also smart in his way. He was twice, a year younger than me, and was in seventh-grade honors.

"Steve, you hear me or what?" he asked me, turning down the volume on the dubia battery-powered radio. It was playing the Big Bopper's "Cherry Lips." Since Buddy Holly, Ritchie Valens, and the Big Bopper had died in a plane crash back in February, the radio stations were still playing their stuff all the time—and here it was June! "You ever talk to a dead person or not?"

"No, Crocker," I said. I was trying to work the air bubbles out of the paper. The Gotha was the only model of its kind and would have a suspension of over six feet. My stepfather had given me the kit for my birthday. "I never talked to anybody who's dead... except maybe you. Now turn the volume back up." But the song was over and the disc jockey was saying something about Lou Costello, who died back in March. I could never remember if he was the fat comedian or the skinny one, but I only liked the fat one and hoped it wasn't him.

Anyway, this was frustrating work, and Crock-a-shit was, as usual, losing everything up. I have to admit, though, that he had made me curious, but just thinking about dead people made me feel jittery, and sad. Too

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It made me think of my dad, my real dad, who died in the hospital when I was seven. Funny, the things you remember. I used to play a game with him when he came home from the office every night. We had a leather couch in the den—Dad called it "The Library"—and I would slide my hand back and forth on the cushion while he would try to catch it. And then when he did, he would hold it tight and we'd laugh. Dad had gray hair, and everybody said he was handsome. But when he was in the hospital, he didn't even know who Mom and I were. He thought Mom was his mother! She cried when he got moved up, and I just felt weird about it. Especially when he had an attack and then talked in a language that sounded like Op-tek. Mom said it was because his brain wasn't working right. I knew that if I could only understand it, everything would be all right. It was like he was trying to tell me what to do in some secret language, and if I could only figure out the words, I'd be able to help him get well. But then he died, and I never got to say goodbye in a way he could understand because his brain never did get right again.

Crocker didn't say anything more for a while, which was unusual for him.

When I had finished the wings, which weren't right and would have to be redone again, I looked up and said, "Crock-a-shit, what are you looking at?"

"Nothing."

"What's with all this dead people stuff?" I asked, trying to treat him like a human being.

"I just wanted to know if you have ever done it, that's all."

"Done what?"

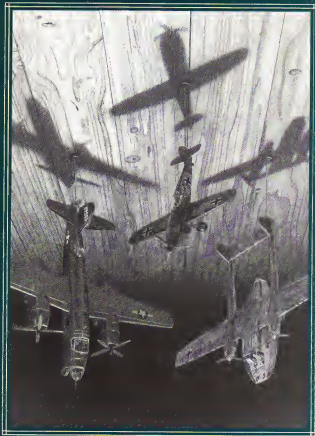
"I just told you! Talk to dead people."

"Have you?" I asked, knowing for sure I would get one of his bullshit answers.

"Yeah, I do it a few times a week. When I don't come down here."

"Oh, sure, and where do you do that?"

"Every day I check the paper to see if there's anything going on at the funeral home on the corner of Allen and Main. If there is, I



just sort of walk in and talk to the corpse in the casket. If not, I come over here.

"And nobody says nothing to you? They just let you walk in and talk to dead people?"

"They ain't bothered me yet." After a pause, he said, "You wanna go with me today? They got somebody in there," and he showed me the obituary column from the *Sun-Bulletin*. I glanced at what he was trying to show me and shook out the sports section. Peterson was fighting Ingemar Johansson on Friday. I was rooting for Peterson, who had KO'd Archie Moore in '56.

"You wanna go with me and see for yourself or not?" Crocker asked, indignantly ripping the paper out of my hands. "Or are you afraid?"

"Scare you?"

"You probably never been to a funeral in your life."

"I've been to funerals before," I said. "Everybody has."

"But did you ever see a dead person?"

I had to say no to that. "I never even see my own father after he died."

That certainly shut him up, but he had such a sorrowful look on his face that I felt sorry for him.

"I'm Jewish," I said, "and Jews can't

have open caskets. Of course, there must be a reason for that, but I don't know what it is."

"How'd he die?" Crocker asked, fumbling around with his hands as if he wasn't used to having them.

"Something wrong with his liver."

"Like from drinking?" he asked.

"No, it was nothing like that," I said. But I had heard my mother talking to the doctor, maybe he did get sick from drinking, although I swear I can't remember seeing him drunk or anything. And I had just about had it with Crocker's questions. He was acting like Jack Webb on *Dragnet*. You'd think he would have to shut up after I told him about my father. But not Crocker. He was a nosy little bastard. After a pause he asked, "Did you ever talk to him after he died?"

"You're out of your freakin' gourd, Crocker. Nobody but an asshole thinks he can talk to people after they're dead."

"If you come with me today I'll prove it to you."

"No way sucker. I got better things to do than act like a nmbienarm."

"With your father being dead and all, I can't blame you for being afraid," Crocker said. "I'd be, too."

"Crocker, get the hell out of my life," I said. I guess I shouted at him, be-

cause he looked real nervous. But I don't need him spreading it all over the place that I was afraid to look at a dead person. Christ, Crocker-a-itis had a bigger mouth than my mother.

"Okay," I said, "but if I don't hear the dead person talk like you say, I'm going to break your head." I said it as if I meant it.

I guess I did.

But the only seemed to make Crocker happy for he nodded and helped me put away my Goths bomber.

The worst part of it was that I had to sneak into my house and put on a suit and tie, because Crocker said you can't just walk in with jeans and a T-shirt.

But a deal was a deal.

I met him at the back of the clubhouse, and we walked to the funeral home. It was a hot, humid summer, and boring as hell. There was never anything to do, and even going down to the club and smoking and working on models was boring. And to make matters worse, I thought about Marie Dickson all the time. She was so... beautiful. I would see her around once in a while, but I never said anything to her. I was waiting for the right time.

Not a good way to get through a summer. Anyway, she was always with a girlfriend, and I was most times by myself. No way was I going to walk up to her and make a complete asshole of myself in front of her and her girlfriend. She hung around with a fat gal, probably because it made her look even better, it seemed all the good-looking girls did that.

"Okay, you ready?" Crocker asked as we approached the front stairs to the building, which was gray and white, with lots of gingerbread like my parents' house.

"I was born ready. Let's go."

I hated this place already.

"We'll go in right after these people," Crocker said, nodding in the direction of a crowd waiting to get past the door into the parlor. "Pretend like you're with them." So we followed them made. I was all sweaty and the sharp blast of the air-conditioning felt good.

The old people ahead of us all stopped to write in a book that rested on what looked like a music stand, but Crocker really knew his way around here and led me right into a large, dimly lit, carpeted room with high windows covered with heavy blue drapes. People were standing around and talking, soft organ music was playing, and there was a line of people filing past an ornate casket that was surrounded with great bushes of flowers.

"Let's go see it and get the hell out



of here." I said, feeling uncomfortable. I looked around. Even though this room was certainly big enough, I felt as if I was being closed up in a closet. And I figured it had to be just a matter of time before someone would see we weren't supposed to be here and kick us out.

"Well till the line gets through," Crocker said. But a woman wearing a silky black dress and one of those round pillbox hats with a veil put her hand on my shoulder and asked, "Did you go to school with Matt?"

I looked at her, and I've got to say I was scared, although I don't really know why I should have been. "Uh, yes ma'am," I said, looking to Crocker—who was supposed to be the professional—to pull us out of this.

"I'm his aunt Leona. You should meet his mom and dad, they're right there." She pointed to a tall balding man and a skinny woman who made me think of some sort of bird. "Stay right here and I'll get them." Aunt Leona said. "I'm sure they'll want to talk to you."

I could only nod. When the women walked away, I said, "What the hell did you get us into?"

Crocker looked nervous, too, but he

said, "Didn't you read the obituary?"

"Piss off, Crocker."

Well, it was a kid who lived in Endicott. His family moved to Virginia. I can't remember the rest.

"You should have told me it was a kid. Christ Almighty!"

"You should've read what I gave you," he said in a singsong voice that made me want to crown him.

"How'd he die?" I asked.

"I dunno," Crocker said. "They don't tell you that kind of stuff in the paper."

"Well, did he go to our school?"

"I can't remember," Crocker said, but it was too late anyway, because Aunt Leona brought a whole crowd to talk to us. I was really nervous now.

What were we supposed to say to the dead kid's parents?

Although it surprised the living hell right out of me, Crocker and I managed to hold our own. We said how sorry we were and what a nice guy he was, how he played a mean stickball and was a regular nut for Bel Haley and the Comets and Jackie Wilson—you know, "Lonely Teardrops"—and it was the craziest damn thing because it was almost as if we did know the kid. With all the crying and hugging going on around us, I started to get that thunder sound in

my ears, which I always used to hear before I was going to cry.

I hadn't heard that sound in a long time.

I didn't even hear it at my dad's funeral, or at the house when everyone stood around and told me I had to be a big boy and all that crap. It wasn't until months later that I heard the thunder sound, when I was in the house alone and practicing the piano. I looked up and saw Dad's photograph on the piano, and suddenly like I was crazy all of a sudden, I heard the thunder and then I started to cry. It made me feel sick. But after that, I didn't cry again.

Until now.

Everybody was crying, including me, and Crocker-sht excused both of us so we could pay our respects to the departed (that's just what he said). As soon as we were out of their reach, he said, "Shows, you're good at this."

"So are you," I said, pretending that it was all an act. "Now let's get it over with."

"Okay," Crocker said, and we stood right before the casket and looked into it. I could smell the flowers—the ones with the long warty things inside them—but they didn't smell bad. The

CONTINUED ON PAGE 41

STILL UNECLIPSED

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ANTIMATTER

UFO UPDATE:

A 900 number offers callers tips on UFO sightings, alien abductions, and E.T. anatomy

Users of telephone direct services, jaded by stock market reports, sports news, jokes, astrological readings, party lines, and erotic lectures, can now dial a 24-hour 900 number devoted to UFOs. Founded by popular lecturer and UFO researcher Stanton Friedman with backing from businessman Ryan Wood, UFOline provides access to Friedman's thoughts about UFO sightings, alien abductions, and what he calls "proof of a cosmic Watergate," an alleged high-level government cover-up of crashed saucers and the origins of UFOs. UFOline callers



can also use the service to report alleged UFO sightings, leaving their names, addresses, and telephone numbers for investigators who might wish to follow up.

Friedman, who claims that "the evidence is overwhelming that planet Earth is being visited by intelligently controlled extraterrestrial spacecraft," isn't shy about stating his views: "I think the government is covering up a very great deal," he says, from the recovery of a crashed saucer or two in New Mexico in 1947 to all the technological developments we've gleaned from them to a knowledge of alien anatomy.

Asked where he believes UFOs might be coming from, he says, "Some at least seem to be coming from a planet around either one or two quite special stars—Zeta 1 or Zeta 2 Reticuli. These two stars are only thirty-two light-years away from us, which is just down the street compared to the size of the galaxy." On the subject of what he believes UFOs might be doing, Friedman adds, "Aliens might want to check us out because if we were to take our brand of friendship, namely destructive hostility, out there we may be a threat to them. As we get ready to leave the earth the cap on the best is going to say, 'Hey, you guys, you don't qualify for membership in the federation' if you were an alien, you'd be concerned."

Friedman says he plans to use UFOline to get the word out to the public about his views on UFOs, as well as to collect fresh data about alleged sightings. He also admits to an additional motivation: "I hope to make a little money," he admits. UFOline costs callers \$2 for the first minute, and \$49 per minute thereafter for each call.

Leading UFO expert Jacques Vallée, the author of *Contact Unknown* (Ballantine, 1995), is not convinced that the UFOline data will be useful to researchers in the

field. "Previous experience," Vallée says, "has shown that UFO sightings of higher credibility tend to be reported in person, rather than on the telephone, to individuals that the witness trusts—when they are reported at all. In the past, UFO screening centers that have relied on 900 or 800 numbers have usually been swamped with the lowest quality and least reliable information."

UFO skeptic Robert Sheaffer, of the UFO subcommittee of the Committee for the Scientific Investigation of Claims of the Paranormal, has called UFOline and isn't impressed with the information Friedman offers. "Clearly, Stanton Friedman is in the UFO business to make a living. By having a long list of selections you can do, he keeps the minutes up and keeps the bills up, which I suppose is the way to do it," he says. "In my opinion, in the time-honored tradition of P. T. Barnum, he's trying to make a buck off of people's credulity. The information that he's offering is at best dubious and at worst downright misleading. Much of it has been seriously challenged, if not totally refuted. You'll get far better information from a responsible science publication than from a thing like this."

Callers can reach the UFOline at 1-900-445-1067.

—KEITH HARARY



ANTIMATTER

OCCULT CRIMINOLOGY

Ritual murders, zodiac killers, satanic child abuse, vampires, psychic detectives, fortune-telling con artists, cops' intuition, lunar effects on crime rates—all will undergo scrutiny by the newly formed Institute for Anomalous Criminology, the branch of Marcello Truzzi, a sociologist of science at Eastern Michigan University.

"Occult crime is a hot topic in law-enforcement circles right now," says Truzzi, coauthor (with Arthur Lyons) of *The Blue Sense*, a book on the subject. Nearly every major urban police department now has a specialist in occult crime, Truzzi says, due partly to an occult revival in society at large.

With this revival in mind,

the institute will serve as a clearinghouse for information on everything from psychopaths who plot murders by astrology to anomalous fire deaths linked to spontaneous human combustion. "Most people concerned with such crimes work in isolation," Truzzi explains. "They think they're discovering America, so to speak, all on their own. I want to get all these folks together in a network, where we can exchange information, educate each other, and legitimize the subject."

To start with, Truzzi and his group will create a network of resource consultants, including criminologists, police officers, social scientists, and parapsychologists. Truzzi also hopes to survey police use of psychic techniques and to test the value of psychically derived

THE SOVIET CULTURE MINISTER MAY HAVE BEEN SURPRISED TO LEARN THAT AS WELL AS CARING FOR THE BOLSHOI BALLETS AND THE MOSCOW SYMPHONY, HE WOULD NOW BE FORCED TO OVERSEE THE SEARCH FOR THE CAUCASUS WILDMAN, THE RUSSIAN EQUIVALENT OF BIGFOOT.

information in criminal cases.

"We want an open-minded approach," Truzzi says. "We're not trying to prove anomalous claims right or wrong. Unlike a purely scientific organization, our main criteria are practical—we want to help solve crimes, find bodies, do whatever else is useful to the police."

—Jerome Clark

"Everybody ends up leaving the wrong person goodnight."

—Andy Warhol

FRIENDS OF THE CAUCASUS WILDMAN

Overcast soil may encompass not only human relationships but also those of unusual animal species. The Association of Cryptozoologists, a recently formed Soviet study group, will be devoted to "the search for animals unknown to science or believed to be extinct."

The group, which is linked to the Tucson-based International Society of Cryptozoologists (ISC), did not have an easy time getting started. As founding member Dmitri Bayanov recalls, "Many hurdles had to be overcome and at times it seemed as if we would not be able to pull it off."

One setback occurred when a Soviet journalist reported that since the Association of Cryptozoologists came under the umbrella of the Duvan Museum, a dependency of the Ministry of Culture, ultimate responsibility for the new organization would fall upon the culture minister. The minister may have been surprised to learn that as well as caring for the Bolshoi Ballet and the Moscow Symphony, he would now be forced to oversee the search for the Caucasus wildman, the Russian Bigfoot.

Nonetheless, the association and its 50 members prevailed. According to chairperson Marie-Jeanne Koffmann, M.D., the group's now busy searching the vast territories of the Soviet Union for giant snakes, chelonis, a variety of large, unidentified birds, and, of course, the wildman itself.

How does the Soviet group compare to its American counterpart? Its philosophy is identical in every way except for a no-killing policy. According to the American newsletter *Cryptozoology*, all applicants to the Soviet organization must promise not to use "any methods that may endanger the life of a human or wildman." —Jeff Goldberg



HIDDEN CODES IN THE TORAH

Since the dawn of religion, the devout have searched for hidden numerical codes in their holy books. Some felt these codes could predict the future. Others hoped they could justify their actions, no matter how unusual they might seem. It's not much different today, except that a group of mathematicians in Israel now uses computers to break the code.

The current Israeli efforts trace back to the 1970s, when American rabbi Chaim Weizmann analyzed the letters of the Torah according to various numeric progressions. He discovered that some progressions occasionally spelled out modern words like *insult*, which did not even exist in biblical times.

Then, in the early Eighties, Israeli Doron Wurtum

ran a similar analysis through a computer. After finding such words as *holocaust*, *Hiler*, and *Eichman* in the Torah section describing the Flood (the first holocaust), the Israelis did a more thorough list. They created a list of 750 rabbis and the years that they died and ran it against the Torah. Amazingly, 749 matches were found. A miracle? Studly Elron, a Stanford University statistics professor, thinks not. "That's a mistake," he says, "is in believing that because you have millions of possible combinations the odds are against you. In fact, if you run enough letter sequences, you will almost certainly find whatever you are looking for. In that case the odds are actually in your favor." Elron concludes that if you look long enough "you can always find patterns in any random set of letters or numbers."

—Alan Seltberg



POOR HENRY

Movie buffs delight in seeing Charles Laughton in his portrayal of England's obese Henry VIII, greedily scarfing chicken legs and joints of roast meat. But fans may be disturbed by the latest theory on the cause of the king's death at fifty-six. According to Susan Marlean Kybett, a fellow of Britain's Royal Historical Society, Henry VIII was probably a victim of malnutrition.

The king's problem, says Kybett, was that he ate too much rich meat and not enough fresh fruit and vegetables. As a result, he

probably contracted scurvy, with symptoms including a bloated body, bad breath, frequent colic, constipation, lethargy, fogfulness, and—as he prior was found out—unpredictable mood swings. His last portraits, says Kybett, depict Henry, then fifty-three, with puffy eyes, cheeks, and forehead, features consistent with nutritional deficiency.

Did scurvy kill the king? "At that time," says Kybett, "many of the gentry were actively prejudiced against vegetables, which, since they grew in the lowly earth, were considered fit only for peasants." —Ivor Straker





"Couldn't we just call a repairman?"

I want a
realistic picture
of the sacrifice it's
taken to become
a winner

The Artist

© ART CUMINGS



TECHNO-WIZARDS

CONTINUED FROM PAGE 52

craft, so that when they communicate with their strategic mainframe computer, the entire system would become infected. Overall, the hacker phenomenon undercuts the authority of information generated through computer systems. So far, most corporations have been rather casual about the potential of computer viruses, deciding that the costs of correcting virus damage would be less than the cost of securing the systems from invasion.

Digitalizer makes other information vulnerable as well. If an image or sound is converted to digital form, operators can alter the final output without a trace. According to studies at the Rochester Institute of Technology, a world leader in optics, one out of every ten color photographs has been altered in some way. More than 500 major corporations possess electronic systems that can alter a photograph's color and composition or even combine elements from different photographs. The popular coffee-table book *A Day in the Life of America* allegedly documented American activities on a given day in history. Photographers spanned the country, capturing journalistic images of what people actually do every day. Yet the publishers altered the cover photo document to make it more impactful. Said more harshly, they rewrote history. What rationale would be so strong as to undermine the credibility of the book's intended purpose? According to Colina Publishers spokesperson Pat Richards, "The cover sells the book."

Using digital technology, technological wizards can replace people in photographs, taking one party away from a scene of the crime, for example, and placing someone else there. In traditional photographic touch-up technology, such a change would be obvious to a photo expert, but in the digital world, experts cannot see the change because the "negative" is a series of changeable electronic impulses and because each print is an "original." Does this moot copyright laws? How can a photographer sustain rights over images that are no longer identifiable?

The same technological principle has seeped into the music industry. Studio "sampling" extracts from already-created digital recordings the sounds of particular musicians (say, the drummer of the Rolling Stones and the bass player from James Brown's band) and combines them to create a totally new sound. How can musicians protect the integrity of

their sounds in such an environment? For certain, advances in digital editing of images and sounds have made the concept of "originality" nearly anachronistic and threaten to make photographic and audiotaped evidence in courtrooms and intelligence for battlefields highly questionable.

Using similar technology, two Montreal filmmakers created a completely fictitious film that starred Humphrey Bogart and Marilyn Monroe, both of whose moving images on-screen came from manipulating digitized versions of original still photographs. Digital Vision Entertainment in California has a stable of "stars" available for the movies, all of whom exist only in the computer. They are, so to speak, the third generation of Max Headroom without the cartoon visage of the original computer-made star. These new characters are real-time, humanlike computer images, each exhibiting traits that exploit popular fashion.

This digital process, when mixed with virtual reality techniques—computer software that creates an artificial but increasingly foolproof representation of the natural world—could create entirely fictitious events. Not only could these computer-driven events include people who are deaf or were not aware of their images manipulation, they could likewise include people who do not and never did exist. While the technology has positive uses (e.g., teaching motion pictures), it has its liabilities. Advertising, political campaigns, propaganda and judicial proceedings must already withstand assaults of hyperbole. What could they become should the technology become accepted? Could professional organizations and consumer groups offer a sufficiently potent ethical balance to these technological breakthroughs?

Data compression—the ability to "compress" or reduce digital information through software efficiencies in order to transmit it faster and cheaper—has reached the status of "hot" technology. The implications of this technology are impressive—offering to make televisions, telephones, and computers into branches of one single communications system that wires together everything from business to the home. Such a gee-whiz technology, however, could facilitate those who would undermine the system. For example, one side effect of its development is the increased potential for videoconferencing—the greatly enhanced ability to hold electronically linked meetings with people in different physical locations. While new and cheaper videoconferencing equipment could save com-



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panies thousands of dollars in travel expenses, each meeting would nonetheless be plagued upon the digital process, once again making it vulnerable to unwanted intrusions, thefts, and alterations. If this vulnerability becomes systemic throughout television, telephone, and computer communications, then any transmitted information could become suspect.

While human misuse of technology has reached bothersome levels, technology can also assume a worrisome life of its own. TRW computer designer expressed surprise when a large network of computers they created began exhibiting "strange, unpredictable" behavior. During these periods, the system could not perform specific tasks as requested. TRW suspected "chaos," an uncontrollable but natural mathematical phenomenon, which mysteriously attacks complex computer systems. Scientists at the Xerox Palo Alto Research Center conducted a series of experiments and discovered that, indeed, large aggregates of connected computers can exhibit unpredictably wild oscillations and unstable behavior, generating unwanted actions in the system. The reality of computer instability—that is, the real potential for chaotic behavior—has raised professional con-

cerns about the appropriate level of computer dependence for military, corporate, and informational systems.

Whether the problem is human or technological, dependency has its price. The greater the capability, the greater the complexity, and the greater the complexity, the greater the dependence on fewer and fewer people who truly understand it. As a result, outsiders become skeptical of insiders' explanations. The U.S. Navy insisted that the Aegis system aboard the U.S.S. Vincennes did not malfunction when the ship fired upon and downed an Iranian airliner. The Navy insisted that human error was involved. Perhaps as a precaution against lingering doubts about the military's technological capabilities, Pentagon officials during the Persian Gulf War emphasized the precision and power of U.S. technology. Military generals and President George Bush insisted that the war was "on schedule" and images of aircraft locating and destroying their military targets made their way from the battlefield to the Pentagon and onto the evening news. But concern over excessive dependence on technology goes beyond military uses.

Historically political critics have argued that the ability to control information could undermine democracy.

Those with their hands on the levers of information flow, the argument went, whether they be editors, politicians, producers, or public relations officers, could mislead the public and make it impossible to reach an informed, democratic decision. The countervailing argument that more information created the counterbalance.

Prior to digital information, withholding information remained a valuable way to control public discussions. For example, battlefield assessments in the Persian Gulf War widely reported to the media during the war proved after the war to be overstated. When the hostilities ended, information slowly reached the press that 70 percent of U.S. gravity bombs missed their targets (quite different from the released videotape images of "smarter" bombs finding their way to specific chimneys) that the bombing had not, as originally claimed, destroyed 75 percent of Iraq's oil refining capability, that at most 350,000 Iraqi troops had faced U.S. troops along the Saudi Arabian front (not the "more than 500,000 troops reported") and that the Iraqi troops were not battle-hardened but, in fact, battle weary from their eight-year war with Iran.

These informational errors were part of an expected government strategy to keep domestic support high for the war. Information control in wartime is something the society involved accepts or rejects based upon its own assessment of what is needed. But digitization could convert dissemination from a propaganda tool into an exact science. Those with their hands on the key boards of digitized information systems could drop, add, adjust, and reshape our entire reality.

Again, one example surfaced during the Persian Gulf crisis. Immediately after Saddam Hussein invaded Kuwait, President Bush showed King Fahd's ambassador to the United States top secret satellite photographs of Iraqi troops within striking distance of Saudi fields. The next day President Bush sent Secretary of Defense Dick Cheney to Riyadh to show the photographs to the king. After that meeting, the U.S. and coalition deployment began.

In September the St. Petersburg Times purchased Soviet commercial satellite photographs of the Middle East region (for two days in September) and then gave those photos to retired defense intelligence officials for deciphering. The independent experts concluded that no significant Iraqi troop massing existed on the Saudi border. Which set of photos—those the United States showed King Fahd or the ones sold to the U.S. newspaper—conveyed





MAKE CONTACT

the correct information, if, indeed, either set did? Is there an "original" that could be said to have an accurate image? Digital technology, because it permits alteration at the electronic level, does not leave a trace of the change for outside observers to discover.

With the ability to amend digital information without a trace, knowing the truth becomes synonymous with believing the truth. Which set of photographs do you believe is accurate? One's choice sways to belief for validation rather than depending on technology for authoritative verification. More important, believing filters personal biases and prejudices into the decision. In essence, digital technology—a rational system—becomes a vehicle to exploit nonrational points of view, when it comes to anything involving digital communications technology, the phrase "seeing is believing" is becoming an increasingly rare aphorism.

This threat to information veracity comes at a time when the fundamentals of society are already under close scrutiny: Wall Street moral lapses, government mismanagement, political corruption, suspicion of corporations, environmental hazards, and distrust of large institutions of all kinds make the problem of information pollution seem even greater. The Wall Street scandal was possible because of the extraor-

inary capabilities of communications and computational technology.

At the same time, computers empowered corporate raiders and armed bottom-line analysts alike, both threatening job security for those not in front of the keyboards. At one time, the social contract between employee and employer seemed everlasting, offering many employees a life's salary in return for a life's work. But debt loads and financial analysis have forced layoffs and cutbacks to hit even the most loyal companies, leaving formerly assumed social contracts in tatters.

English Luddites of the early nineteenth century hated the machines that displaced them so much, they mounted night raids to destroy the factories that had made human handicrafts obsolete. Today computers do not simply do human work, although they can; they also facilitate complex calculations that suggest certain jobs are not productive or efficient enough. As a result, even more people have lost their jobs. Ironically, the computer itself has created some efficiency problems.

Computer technology promised the paperless office, but paper use increased six times in the decade following the introduction of the personal computer. Office technology promised more leisure time, but in the years following the advent of computers, mobile phones, and fax machines, work hours spread over another six hours. Psychology Today printed the results of a survey that asked people what they would do if they had four hours added to their days. The largest percentage of respondents chose reading (38 percent), while others chose household tasks (31 percent) and hobbies (27 percent). Information technology was not on the list. No one said "listen to a book" or "watch a video."

People pushing away from the onrush of information manipulation and choosing instead to garden (the number one outdoor activity), play with the kids, or take a walk may be an example of Americans' ability to avoid dealing with problems. It may also suggest, however, that people are seeking ways to avoid excessive dependence upon technology and to negate the authority of those who control it.

Those "in charge" despite the military's successful Persian Gulf action, do not seem to be as much in control as formerly believed. Computer hackers and digital photo manipulators undermine the credibility of the control that high-tech gadgetry promised. Nuclear accidents in Japan have reawakened the Three Mile Island and Chernobyl fears of technology running uncon-

trolled. Perhaps anxiety over the shortcomings of technology is causing people to step back and take a breath.

In the nineteenth century not too many years after the Luddites disrupted British factories, French writer Alexis de Tocqueville, discussing American institutions, wrote that "true information is mainly derived from experience." As an extension of human abilities, technology promised a more effective, more accurate set of experiences. Recent innovations and the reactions they have provoked, however, have lent credence to that promise. The rapidly expanding population of techno-outcasts stands as proof of the undemocratic effects of technology upon social institutions. The growing number of people who use computers find that they are working more rather than fewer hours because of the new machinery, and they have pulled back from their desks. The higher sites who design the machinery find themselves in a battle with disgruntled hackers who play a game of sabotage the way children play Nintendo. All in all, De Tocqueville's thought that experience is the only true source of information has come full circle. With untastable data and manipulated realities, personal experience has again become the best source of knowledge. Every step forward as Marshall McLuhan intimated, is also a step backward. **□**



NECESSARY SOFTWARE

INTERVIEW

CONTINUED FROM PAGE 84

Berman: No. It's my guess the sharp split between Self and Other occurred during the Neolithic agricultural revolution [about 8000-9000 B.C.] when animals were domesticated. It's important to understand the differences between Paleolithic [hunter-gatherer] and agricultural people. In hunter-gatherer times, tendencies in the human psyche for conflict are indicated in the archaeological record—flint arrowheads embedded in skulls, for example. But war—organized conflict, including the building of fortresses, which is the Self/Other line made manifest in stone, the concept of the "boundary," the erection of city walls—all of this happened during the agricultural revolution.

Self/Other distinction can exist without turning into Self/Other opposition. A differentiated universe can still be handled. With the domestication of animals, however, Neolithic people separated the wild (for example, tigers) from the tame (horses, for instance) and created binary thinking. A distinction is made between the Other that is now seen as "us" and the Other that is identified as "not me." The major psychic

fallout for human beings is that Self and Other now constitutes an antagonism—not a polarity. Self is tame—good? Other is wild—bad?

We were hunter-gatherers for a million and a half years, and then we sat down for ten thousand years. Given the time line, war and binary opposition are aberrations. I hope we will eventually address our somatic nature and look into the face of our pain. Until we do that, there's no way out from "inventing" history. Even World War II was invented in this sense, although I'm certainly glad we defeated Hitler. I wouldn't be here if we hadn't. We've had ten thousand years of a "nightmare," as James Joyce put it, because we've rarely grasped the nature of our own need for "God" or the extent of our somatic damage. If God has a future, it lies in the body or at least through it.

Qmr: How do Paleolithic and Neolithic worldviews compare?

Berman: The Paleolithic evidence is lost in the mists of time—a few skeletons, arrowheads, cave paintings, and contemporary aboriginal cultures that may provide clues as to what life was like. The Neolithic evidence, on the other hand, is fairly good. Given that caveat, I'd say the emphasis on verticality in Neolithic times is fairly obvious. In

Neolithic culture, God is seen at the top of the axis, and humans, at the bottom, must climb the ladder to God. Look at the architecture: pyramids or monumental temple structures, symbolic of the sharp division between the sacred and the secular. And if you're stuck in a Neolithic [farming] mentality, you ask only one question of the plant world, for example: What is edible, what is inedible? That's the binary world.

Hunter-gatherers, however, lived in a culture in which subjectivity was raised to such a pitch that everything seemed to blaze. Imagine living in an eroticized world all the time. The Paleolithic worldview can perhaps best be described as kaleidoscopic. The modern psyche, on the other hand, seeks an eternity of focus. For example, in the nineteenth century we create romantic love and start to place a tremendous emphasis on the significant other, and on sexuality, because by now eros doesn't exist anywhere else.

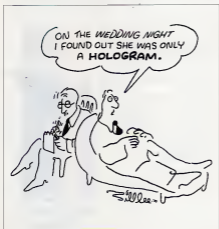
In hunter-gatherer societies, eros is diffused throughout the entire culture. Leaves, berries, and animals all shimmer. Each plant is unique. God is a "horizontal" God who permeates the environment. But we lifted the horizontal axis into a vertical one and now need to make wars or find oblivion. Junkies shooting heroin on street corners are essentially looking for God and finding Him, in a strange sort of way.

Qmr: Can we return to a golden age when the race was not beset by war, madness, and binary conflict?

Berman: No. A hunter-gatherer state depends on small population clusters, bands of five hundred or less, achieved by a kind of casual infanticide. We're not, I hope, going to practice infanticide, which means we now have to maintain a population of nearly six billion people. But if we can't go back, we can go forward in a new way that may allow for a recovery of that earlier, nonbinary consciousness and a recovery of a lost somatic integrity.

Qmr: What is somatic history?

Berman: We've discussed one example—the various interpretations of the Gulf War. George Bush's body language and our need to be "redeemed" are not going to appear in print. But that is precisely the sort of information that would show up in a somatic history of the war. In a larger sense, there is a hidden somatic level on which history proceeds. When we write history, we skim off the visible shell—the history of ego consciousness—palpable material events. We look at artifacts. Pottery shards are hard, they endure. But what about the stuff that doesn't endure, the nonrational foundations of



history—humor, anger, and fantasy?

The human drama is first and foremost a somatic one. Suppose some tribe had a marvelous mode of conflict resolution; suppose they had a wonderful technique of dream analysis. That's not hard data; it doesn't show up in a rock. The soft underbelly is the somatic history, and my argument, damn it, is that's where the real drama of our lives, not what's reported on the six o'clock news, takes place. What was congealed in the Berlin Wall, in terms of pain and grief? That's somatic history—an "artifact" pecked with human stories. I'm not advocating turning history into anecdotes or projecting any half-baked ideas onto a vacuum. But we have to modify the methodologies of data accumulation and analysis we learned in the nineteenth century and create new ones. I don't have answers, but I do have some guesses as to what a new methodology would consist of. The evidence should not be limited to what we find in old manuscripts.

Orin: You have written about the history of mirrors. How does the history of the mirror parallel the development of consciousness?

Berman: I assume that if mirrors are more present in a culture at any point, it means a greater interest in self-awareness. It turns out that the Venetians began to manufacture silvered glass on the lake of Murano during the Renaissance—part of the so-called "emergence of the individual." The obsession with mirrors climaxes at the Hall of Mirrors at the Palace of Versailles, where people constantly looked at themselves. Chart the manufacture and diffusion of reflecting surfaces, and you get a curve of the nature of self-awareness in any period. The mirror as the map of the evolution of consciousness is a good example of the type of methodology we might consider when examining somatic history. Technology is also a record of consciousness.

Orin: The American educator John Holt claimed that children come into the world with a biological urge to make sense of it.

Berman: I call that the "cosmological urge." Cosmology explains the order of things. The infant comes into the world already programmed to make sense of it, and that urge is deeper than the need to suck the tit. We are creatures genetically programmed for meaning. From the need to "make" meaning comes the desire to create stories, explanations, theories—our greatness. But this can easily slide into an unhealthy dependency in which we buy into easy explanations that others hand us as life rafts. Buying the explanation that

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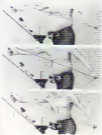
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Isaiah is evil and we had to rebel against—that's sucking the life.

Omni: Do you perceive rumblings "deep down" that caution: Beware of easy answers?

Borman: Hopefully yes. That's why I wrote about the cycle of heresy and orthodoxy. Rooted in bodily experience, heresy rejects the central, formulaic life of the dominant culture. Heretical movements—Gnosticism, early Christianity, alchemy, witchcraft—disrupt cultural patterns that outlived their ability to provide genuine spiritual experience. A group arises and demonstrates its ability to deliver the goods, the essence. What happens? It often succeeds, becomes the new orthodoxy, and within a century, it itself has forgotten about essence and is preoccupied with form. As a result, it evokes a new heretical challenge. The goal of all heresy is to undo the process of alienation, to take us back to our kinesthetic origins. An entire culture can undergo serious change as a result of the accumulation of enough psychic or somatic changes on an invisible level—the stuff of history that's never discussed.

Omni: Give us an example of a heretical movement.

Borman: In ancient Palestine, the Jews got frozen around the notion of the Torah as sacred text. The Pharisees were preoccupied with form and ritual, not essence and content. What did Christ say? What comes out of your mouth is more important than what goes into it. Don't give me a fastidious list about dietary laws, he said. How a human thinks and feels is crucial, not whether he ties his shoelaces in a certain way. The Pharisees taught piety but didn't have the life.

So a sect grew up in opposition to orthodoxy, formed a breakaway movement. Electricity moved, somatic energy flowed—laying on of hands, healings, speaking in tongues. For about a century the system was open, no one closed the options. Then the new energy hardened and crystallized around a dead figure with a dogma and a hierarchy of priests and deacons. Now we read the hagiologies instead of taking the trip.

Omni: By Saint Augustine's death around A.D. 430, the forms solidified. Between the fifth and tenth centuries, we have a

Borman: Strange vacuum precisely the type of phenomenon historians should investigate. Christianity emerged out of a kind of Jewish Gnosticism and hardened into a closed cultural entity—a clerk, singularly monochromatic culture known as the early Middle Ages. Look at Carolingian art: frozen bodies, frozen

God. The lack of documents from the early Middle Ages on interiority or intentionality is a bit eerie. There are only two known references to mirrors in several hundred years.

The American historian Charles Fieding first proposed the idea that people in this period acted in a robotic way—five centuries of strange mechanical behavior. The Church required penance, rather than contrition, for sinful acts. Imagine a civilization in which there is no interiority. Few historians have seriously considered the possibility that people in various periods of history could behave and perceive in radically entirely different ways than did people in a prior period.

A total revolution in perception occurred in the eleventh century concomitant with the rise of a heretical movement, the Cathars, who challenged the dominant worldview. Interiority reappeared. Everything changed—the concept of friendship and marriage, the use of penitence, an emphasis on internal repentance, the importance of intentionality in legal matters, the development of logical argumentation, the practice of private meditation, and the birth of romantic love, the idea that I voluntarily commit myself to another person because of the intensity of feeling. The downside: The church began to scrutinize the state of your soul, picking it apart during the Inquisition. How you answered determined whether you lived or got burnt at the stake.

Omni: What is the next system break you investigate in your book?

Borman: The rise of modern science. The third heresy starts out as an inquiry into nature—the alchemical and magical traditions. For the first time in history, the human being is conceived of as an operator and an active participant in the manipulation of nature, of which the greatest document was probably *The Discourse on the Dignity of Man* by Pico della Mirandola. The control of nature—the very heart of the modern scientific paradigm—has its historical roots in the Renaissance Hermetic vision of soul travel and ascent. But the alchemical worldview hardened into the mechanical worldview of the seventeenth century which, I think, is breaking up today.

Experimentation, measurement, technical mastery became the hallmarks of the new age. The question "How?" replaced the question "Why?" Truth was equated with utility, thanks to Bacon, among others. Newton told us, What is, is measurable. Fact and value were split apart. We nature and nature will yield its secrets. So we tortured nature for four hundred years, unrelentingly in

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the consequences of our inventions. Technology became the source of a new epistemology embodied in the concept of experiment.

Qmr: What do you think of the current New Age?

Berman: I'm disappointed. When the movement first slashed the fabric of the scientific worldview, it was exciting, everything seemed to tumble out, and new possibilities emerged. But we're not willing to stay in ambiguity. We turned the New Age into the latest plan for redemption, the latest ideology. Holism is our new paradigm. The thrill of exploration is gone. We go into formulae so easily because we're scared. I've met people at New Age conferences who were into Freud in the Fifties. Now they're into crystals. Don't they see the form is really the same? Qmr: You've suggested we 'go horizontal,' drop the ascent structure, and in the process maybe find the 'sacred' all around us. Can we do it?

Berman: The ideal may be somewhere around forty-five degrees. The attempt to be pure creates a series of neurotic problems. A purely horizontal world—complete concentration on the word—often ends up in a state of nihilism. 'Empireless.' Eastern mystics have realized doesn't mean the annihilation of ego or of all verticality, but the establishing of a relationship with it so that you control it rather than being controlled by it. Part of the answer is to differentiate between the cosmological urge and the desperation for salvation or redemption. When you strip away the need for salvation, you open up the possibilities of an organic, cosmological urge that's true to yourself and is not based on substitute drugs.

I don't categorically put down orthodoxy. If I want to eat chocolate, it's nice to have it pressed into little bars labeled HERSHY. I don't need to stick my head in a vat of chocolate and say, 'Oh! Chocolate, me, and the cosmic! Form is necessary, but it's not God. It may be useful for people to congregate in a building and smell incense. The key is to stay away from the pharmaceutical position of turning nuts into religions and tools into worldviews.

Qmr: I've been reading Ray Monk's new biography of Wittgenstein. In his diary Wittgenstein wrote, 'I feel more sensual than before. Today I masturbated again.' Monk says 'What appears to emerge from his diary is that his desire to masturbate and his ability to work were complementary signs that he was, in a full sense, alive. One might almost say that for him, sensuality and philosophical thought were inextricably linked—the physical and mental manifes-

tations of passionate actuality.' I wrote 'Berman' in the margin.

Berman: Monk's biography ties the psychosensual, emotional Wittgenstein to *The Tractatus* and the Philosophical Investigations. Read it and you begin to understand that philosophy has an emotional, sensual base. Why does Descartes denigrate sensory experience and call it unreliable? I think Descartes rejected sense experience and sensuality for pure rationalism after the death of his daughter, when life became too emotionally painful for him. On that scheme, of mind split off from body, we will always have to deal with a pure, Platonic world of forms that logically fit together, a perfectly vertical vision of reality, a ladder to the truth.

But that's not the end of the story. When Wittgenstein finished *The Tractatus* he realized he had compiled a theoretical analysis of theory. In that sense, it was the apex of twentieth-century philosophy. What does he do afterward? He goes completely horizontal, becoming a gardener and a schoolteacher in rural villages in Austria. He works with his hands, compiles a grammar of Lower Austrian dialect, for God's sake! He lets himself experience his sexuality. There are two Wittgensteins: a purely vertical one, and a purely horizontal one. The last time I was in Vienna, I toured the house Wittgenstein designed for his sister, Margarete Storer-Brough. It is now get this: the Bulgarian embassy! The house is a perfect physical embodiment of *The Tractatus*—sparse, minimal, masculine, young and lean. But he designed it ten years after he wrote *The Tractatus*, when he was already 'grand horizontal,' already a different person. Yet he was caught in a time lag. We can demand miraculous transformations from people. They have to work through their dilemmas in their own time.

Qmr: You have said the West today is the dullest and/or possible for Fascism. Berman: People are spiritually desperate. I guess somatic damage and emotional desperation have multiplied over the millennia since the agricultural revolution. Today people are born in mechanical circumstances in hospitals with glaring lights and are immediately taken away from the mother. What do we mean by 'God'? We mean bonding. Damn it, that's the crux of it! But we deny our need for bonding and go in search of substitutes. Somebody packages 'God' in a formula, and it's guaranteed to attract thousands of people. The God syndrome. Perhaps Dostoyevsky understood this best of all. In *The Brothers Karamazov* the Grand Inquisitor tells Christ, 'The over-

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lasting wish of the human race is to find someone to worship. This is finally what fundamentalism—religious or otherwise—is about.

Oh, isn't it ironic that in the Information Age we seem to know less and less about the world?

Berman: The Gulf War was portrayed by the news as the war of graphics. We're fed lots of information, but we learn nothing. It's all the same kind of information—computer made, binary mode, the McDonaldization of the mind. We think in thirty-second sound bites, and the information industry caters to that mentality. Information is instantly packaged so we don't have to think, though we think we're thinking.

But there are significant course corrections. Some people are dissatisfied with the larger culture, and they're moving away from a packaged and prefabricated world in which everything is handed to them in the form of a Harlequin Romance. Like many authors I get the most remarkable letters from people all over the country. Dramatic stuff. Not everybody has been so overwhelmed by the media that they want to stuff their pants, question, or doubt believe in the Gulf War, and think everything's just fine. There are people who want to get to the bottom of their pain.

On a hudson, somatic level such change might be aloof, and that's a hopeful possibility. Here's another quote from *Roadside*: In a dark time, the eye begins to see. Not Utopia, perhaps, but just possibly a nonformalistic experience of life. And that's not half bad, you know? **CC**

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JUG20029H

said "They can make anybody look good as new, almost. He could have even had cancer."

Crocker looked up in the air. I called his name, but he ignored me. It was as if he was listening to something. He had his head cocked like the RCA dog.

"Crocker, come on," I said after a while. I was starting to get worried. "Hey, you, Crocker-a-dit!"

"Shut up!" Crocker snapped. "Can't you hear him?"

"Hear what?"

"Just listen."

I listened, I really did, but I couldn't hear a damn thing. Crocker was probably off his nut, plain and simple. But I wasn't much better, not after I had just seen the corpse glowing like the hands on a watch.

Who knows, maybe the dead guy could talk. And maybe Crocker could hear him.

But I just wanted to get out of there. I was already feeling like the walls and everything were going to close in on me.

"He's leaving," Crocker said. "He's saying good-bye to everybody. Cool?"

"Okay, then let's go," I said, but I couldn't help looking at the spot where Crocker seemed to be staring, and I got the strangest feeling. Then I saw it: a pool of light like a cloud that seemed to be connected to the body that was now glowing softly again.

And the light was bleeding out of the corpse like it was the guy's spirit or something.

A few seconds later the light just blinked out, as if someone had thrown a switch, and the body looked different, too, as if something vital had just drained out of it. Now it was nothing more than a shell. It looked like it was made of plastic. It was dull, lifeless.

We left then. Crocker and I just left at the same time, as if we both knew something.

And I heard thunder and remembered my father talking in the language only he could understand, and I felt as if I was drowning in something as deep and as big as the ocean.

When we got out of the funeral home, and past all the men standing around and smoking cigarettes, Crocker said "You heard him, didn't you?" I could tell.

"I didn't hear nothin'," I said, protecting my ass.

"Bullshit," Crocker said.

"Bullshit on you," I said.

"Well, you were acting different," Crocker said.

I admitted that maybe I saw some-

VOICES

CONTINUED FROM PAGE 73

kid in the casket was wearing a suit and tie, just like us. He looked like Pug Fishers, who lived down the block from me. The corpse had black hair, which was greased back; he had probably worn it in a DA with an elephant's trunk in the front, but whoever did him up probably thought a flat-top was the height of coolness. It looked like he had had pimples, too, but his face was coated with makeup, and it looked too white. Like someone had gone crazy with the powder or something. The expression on his face was kind of anery. I guess they couldn't wipe it off. I had a strong feeling that I would have liked this guy.

But looking down at this corpse made me feel sort of weird. Not that I was scared anymore, but this kid didn't really seem to be dead. It was like this was some sort of a play, and everybody was acting, just as we were.

The guy just couldn't be dead. He looked like he was going to sit up any second.

I blinked then because it was almost as if he was glowing like one of those

religious paintings I've seen in churches. It was as if I could see the stuff of his soul, or something like that. Christ. I almost fell backward.

I knew that was all bullshit, but I saw it just the same.

Crocker didn't seem to see it; at least he didn't say anything. So it must have just been me.

And then I remembered something about my father that scared me: It just sort of came out of nowhere!

I remembered the nurse taking my arm and trying to pull me out of the hospital room. Mom was crying and screaming, and she fell right on top of Dad on the bed. But I got one last look at Dad, and he looked like he was made up of light, sort of like a halo was around him and all over him.

How could I have forgotten something like that?

But I did. I must have just pushed it right out of my mind.

"How'd you think he died?" I asked Crocker, hearing my own voice made me feel normal again. And that was important right now.

"Who knows? Probably some sort of accident."

"Nah, he looks too good."

"That don't mean nothin'," Crocker

thing that was a little weird, but it was probably just in my head. That bent Crocker all out of shape; he seemed happier than a kid with a box of Ju Ju Bess, and I got worried that he'd shoot off his mouth to everyone he saw.

I warned him about that. "Give me a break," he said. "It's enough that the guys in the club think of me as some sort of asshole, so it is you're the only one I feel I can talk to—and I don't even really know you."

"Okay," I said, worried that maybe there was something wrong with me. Why else would Crocker feel that way? It also worried me that first I saw the dead guy glowing like my aunt's Sylvia Hologram TV, and then I saw his soul (or whatever it was) pass right out of him, leaving nothing but a body that was more like a statue or something made of plaster of Paris. But I put those thoughts away and asked, "What did the guy say?"

"His name is Matt, remember? He said he was scared out of his gourd until he found his grandmother."

"What?"

"His grandmother's dead. She'll show him around."

"Around where?"

"How the hell should I know?" Crocker said. "Heaven, probably."

"You gotta be kidding." I couldn't help but laugh. "You're making that stuff up." But somehow I really wanted to believe it.

"I thought you said you saw something," Crocker said, hanging his head. "And I believed you... I wanted to know what you saw—"

"I said I thought I saw something," I punched him hard on the arm to make him feel better. "And it wasn't nothing but a glowing like a TV tube when you turn it off."

"I never saw that."

"Now tell me, what else did Matt say?" I asked.

"He hates Bill Haley, but we got Jackie Wilson right."

"Uh-huh," I said.

"Well, that's what I thought I heard," Crocker said.

"Why'd you say 'Cool'?" I asked.

"Whaddyaman?"

"When you were looking up at the air, you said, 'Cool.' Don't you remember?"

"Yeah."

"Well?"

And Crocker started laughing. It was like he couldn't stop. He kept leaning forward and stumbling and then laughing even louder. I couldn't help but smile, and I kept knocking his arm until he told me

"He said he was going to visit the Big Bopper."

"What?"

"That's what he said. And Ritchie Valens."

"You're so full of crap," I said. But now I couldn't stop laughing either.

"Then maybe dying's not so bad," I said, and we fell down right there on the sidewalk on Akeley Avenue in front of a brown shingled house that belonged to Mrs. Campbell, my third grade teacher. I don't know what it was, but I just couldn't stop laughing and crying.

Neither could Crocker.

And who knows, maybe I really did see something flickering in the air above Matt's dead body while he was floating around in Heaven somewhere meeting his grandmother.

And maybe he did get to see the Big Bopper.

Just like the Big Bopper probably got to see something flickering in the air above Valens and Holly—and probably Mozart and Beethoven, too.

And maybe the Big Bopper also got to meet my dad.

Why not? Dad would be there, standing right on line, he always liked to play the piano, all that bebop and boogie-woogie stuff. So maybe he became a musician, just like all the others.

Now that would be something... ☐



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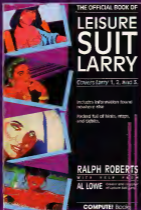
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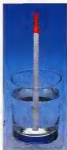


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COMPUTER GAMES

ADVENTURES IN COMPUTERLAND:
Playing on-line is real interactive entertainment.
You never know what might happen.

I went to a wedding the other day, in a place called Kefauver Landing. It was not your average wedding. The bride and groom were elves and the guest list looked like something out of a J.R.R. Tolkien trilogy. And of course, you'll never find Kefauver's Landing on any map of this world.

The wedding occurred in the fantasy world of *Simutronics Gamescape III*, a hybrid computer game known as an interactive on-line multiplayer game, or MPG, where you encounter characters controlled by other people, not the computer. MPGs represent another side of virtual reality, one without the hardware. With bulky headsets producing three-dimensional wireframe graphics, virtual reality can't produce an illusion of reality because it doesn't require an emotional investment.

MPGs however tap emotions and achieve a heightened sense of reality by focusing on imagination, without biomedical enhancement.

While simple MPGs have been around for some time on small local bulletin boards, major commercial on-line services like GEnie and CompuServe are stimulating imaginations with increasing sophistication and success. Games range from the card and board game genre of GEnie's *MSCARDS* to game shows like CompuServe's *You Gussed It*, in addition to a variety of MPGs.

Sierra On-Line has now joined the on-line game service with *The Sierra Network* (TSN), initiated this summer in the California market. Planning to go nationwide by the end of the year, on its way toward creating a "nationwide computer neighborhood," TSN will offer such board games as chess, checkers, and backgammon, as well as bridge and other card games. Optional services include *SierraLand* aimed at children, and *LarryLand*, offering adult fare on a Las Vegas-style strip.

The most popular MPGs are the ones that allow the great-



est number of players to play with the greatest degree of interaction. *Kosmos Corporation's Air Warrior*, for example, pits as many as 50 players against each other in a graphics-based environment. The multiplayer aerial combat simulation offers an array of more than 20 vintage combat aircraft from World War I, World War II, and the Korean War. Players can fly individually, in squadrons, or even as members of a bomber crew. And the human opponents create game dynamics impossible to duplicate in conventional computer simulations.

Unlike the graphics-based *Air Warrior*, GEnie's *Gamescape III* relies entirely on a text-based interface to create a role-playing environment where as many as 55 people at a time can act out their fantasies through alter egos of their own creation. And the sophisticated host program permits on-line modifications and upgrades in real time. Interestingly, many of the new ideas introduced—like the wedding in Kefauver's Landing—are the result of player input and often don't even advance the game. *Gamescape* players give a great deal of attention to the development of their game personas, generated from the ground up, from adolescence through apprenticeship, including physical characteristics. The overall effect is like stepping into the pages of a well-written book and becoming an active participant in both the writing and the telling of the story.

But will the marriage of technology and imagination enhance or inhibit our abilities to interact with each other and the world around us? Will we evolve into a higher order of social animals or become increasingly isolated, wired into a dreamworld where it's all touch and no contact? Perhaps the answer lies in the human mind: the delivers an emotional payoff. And unlike passively watching television, MPGs require not only active participation but also the full use of your creative faculties.—JAY KEE **DC**

GAMES

COCKEYED CONCOCTIONS.

These mixed-up drinks go straight to your head

By Scott Morris



There have been knock-knock jokes, good news/bad news jokes, and light bulb jokes. Last February we introduced readers to the mixed-up drink pile concoctions meant to be heard or read rather than actually drunk. We provided such examples as a Phillips' Screwdriver (vodka, orange juice, and milk of magnesia), a Tequila Mockingbird (José Cuervo and birdseed), and a Bloody Awful (vodka and ketchup). For Competition #52, we asked readers to create their own mixed-up drinks offering \$100 to the grand

prize-winner and \$25 to each of the nine runners-up. Each winner also receives a copy of *The Emperor Who Ate the Bible*.

GRAND PRIZE

Shirley MacLaine (sugar-carbonated water, ginger extract, syrup, and pomegranate or what ginger ale and grandma wine in a previous life)—Rob Ruff, Omaha, NE

RUNNERS UP

• Sneed O'Connor (Irish whiskey and Narr)—Chris Boyer, Urbana, IL
• Short Wave (Ripple in a

shot glass)—David McAnaney, Newton Square, PA
• Coleman Cooler (white wine, soda, fried chicken crumbs, and sand)—Peter Scheschler, Palm Springs
• Honeydew the Delites (Midon and Dawn)—Cheryl Wilford, Arlington, VA
• Alexander the Grouat (gin, crème de cacao, and sweet cream over Koflogg's Corn Flakes)—Beverly Dotaloho, Blairstown, NJ
• Mary Poppins (vodka, tomato juice, and a spoonful of sugar, decorated with a paper umbrella)—Melissa DeVine, Nacogdoches, TX
• American in Paris (Kentucky bourbon and champagne)—Lorna Mueller, Olympia, WA
• Oil of Ole (Mazola and sangria)—Carl Forester, De Funes Springs, FL
• Three Men and a Baby (Jim Beam, Johnnie Walker, Jack Daniel's, and Enigma)—Todd Morrow, Weston, WV

HONORABLE MENTION

• Quack Doctor (cold duck and Dr. Pepper)—Richard Dubai, Mendon, CT
• Absolut Zero (Absolut vodka over frozen netopog)—Tom Jones, Indianapolis
• Soolch Tape Worm (Dewar's and mescol)—Karyn Worden, Vulpine, NY
• Marie Antoinette (bourbon cake mix and flat beer)—Rob Ruff, Omaha
• Shipwreck (Cuffy Sark on the rocks), Port in a Storm (red wine and rain-water), Sour Kraut (schnapps and lemon juice)—David McAnaney, Newton Square, PA
• Martinizer (gin, vermouth and carbon tetrachloride)

—Steve Newman, San Jose
• Fuzzy Navel Itzas (peach schnapps, orange juice, and ammonia)—Ed Roth, Vineland, NJ
• Sake-to-me (rice wine, punch, and nitrous oxide)—Helen Pappas, Millbourne, PA
• Blood Clot (vodka, tomato juice, and Jell-O)—Andrew Pitzer, Federal Way, WA
• Gorbachev (vodka with a splash of port wine)—Wyl Parks, Evansville, IN
• George Bush (George Dickel bourbon and Busch beer)—Sally Urban, Sunrise, FL
• Three Mile Island iced tea (vodka, gin, rum, tequila and plutonium)—Colin Gubenez, St. Joseph, MO
• Band Faith (wood alcohol and sacramental wine)—Randy Mott, Austin, TX
• Mexican Heretics (tequila and Minocin)—David Benito, San Francisco
• Sundae Driver (vodka, orange juice, and ice cream), Skid Roe (muscle and caviar)—Joseph Lurawski, Cleveland
• Peter, Paul, and Mary (potassium nitrate, Paul Mexican wine, and tomato juice)—Paul J. Baldi, Reynham, MA
• Blue Moon (corn whiskey and Aqua VIVA)—Tim Boatley, Virginia Beach, VA
• Black Sabbath (Kahlua and Mogen David wine)—Joel Saeks, Brooklyn
• A Rum With a View (Bacardi and Wane)—Mitchell Pipe, Plainfield, NH
• Rum Pole of the Italey (Bacardi rum, Popov vodka and Bailey's Irish Cream)—Karl P. Fisher, Edmondson, Alberta, Canada **GG**

LAST WORD

TOUR DE TRANCE:

Auto-visualization will take you for a ride

By D. Patrick Miller

Facilitator's Note: In just a few giddy years, the practice of creative visualization has migrated from the ivory towers of New Age therapists into the power lounges of corporate America. There's hardly anything the imaginative power of the mind cannot accomplish, and no problem insoluble by purposeful daydreaming.

The everyday applicability and power of visualization can even help you transcend one of life's most inky-ink occurrences: the breakdown of your car. Although originally channeled for use with the classic Volkswagen (VW) bug, you can adapt the basic principles of this technique to any automobile, however. Remember, it's always *mind over machine* and not the other way around.

You are high in the hills above California's Half Moon Bay, and it is nearly dark. A foggy rain blows in rushing billows. Your ancient yellow bug sits by the side of the road. Ten minutes ago it rolled to a stop after mumberg "kaput" with the drifing ambra of finality. Threats, plaintive whooping, and offers of long-dented attention are failing to spark the geyser. Muttering all of your mechanical genius you have hunted for obvious problems—blown hoses, loose connections, running sores, hissing snakes—anything. No dice. The traffic so plentiful a while ago has dissolved into the swirling mists.

Now is not the time to lose your cool. It's time to tap the extraordinary power of creative visualization. Get back into the car. Sit comfortably in the driver's seat, grasping the wheel in the traditional "ten and two" position, and close your eyes. Breathe in deeply through the nose, filling the abdomen—the "golden stove of the Oriental ancients"—then the upper chest, making a subtle *hoo* sound through the nasal passages. Exhale smoothly with your mouth open, making a long *hssst* sound.

The steering wheel is growing warm in your hands. Keeping your eyes closed, you can "see" the wheel beginning to color from pink to the deep red of an electric range. Just before it grows too hot to handle, it begins a slow clockwise rotation, picking up speed until it has become a blinding, fiery wheel of energy. Suddenly a crimson spark shoots down the length of your steering column, striking deep into the psychic nexus of your VW.

The inner bug is awakened, along with the colorful spirit creatures that populate the astral level of Volkswagen consciousness: blue-faced harpies, clumsy, black-shoed griffins, and tiny winged, tuxedoed kittens. They are circulating through the vents and windows of your car, buzzing softly, sealing the expression of your slightest whim. You realize that they will take you out of your predicament and carry you anywhere you want to go. What is your command?

Fondly remembering your last vacation, you say "Well, I'd rather be sitting in the lounge of the historic Ahwahnee Hotel in Yosemite Park!" You shiver. "Could use a cup of coffee, too."

To your astonishment, the whole vehicle is lifted on the wings of the mystical creatures—

the upward thrust is about, say, one and a half g's—and borne quickly above the hills and then the clouds.

Before you know it the bug is banking and diving into a dizzying descent, and suddenly a sheer rock wall appears to your left, a little too close for comfort, rushing upward dramatically as you drop by. No sooner do you feel a little anxiety over an impending crash than the car noses into an invisible pillow—*plooft*—and you can see lights and feel warmth from below. Still firmly grasping the wheel, you are dropping ever so gently right down to the floor of the great lounge of the Ahwahnee. The car settles onto its wheels so close to the silver coffee urn that you can grab a cup without opening the door. Not a bad visualization!

As you reach for the cream and a spoon, your pleasant aura of success is rent by the screams of two well-dressed lazing motorists. A young, Earth Mother-type couple sits in a nearby love seat, stunned by the interruption of their mushroom-induced reverie. A bellboy is shocked at the sight of mud and oily water dripping off your bug and onto the Ahwahnee's gleaming wood floor. He screams. The griffins are terrorizing young children; the tiny tuxedoed kittens are obviously not hotel framed, and the harpies have flown away to the dining hall, carping loudly and creating general mayhem.

You twist in your seat just in time to see two big, burly park rangers hustling toward you with big sticks. The coffee spills in your lap as you attack the starter savagely. Nada. The alarm car still can't start, and you're in an unbelievable fix.

Okay, you take it from there. And don't forget the deep, rhythmic breathing! ☐

D. Patrick Miller has recently been visualizing a chauffeur'd ride to the bank.

