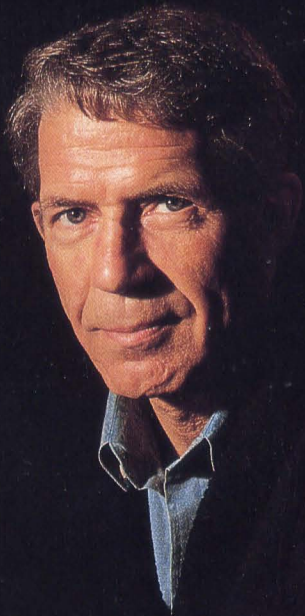


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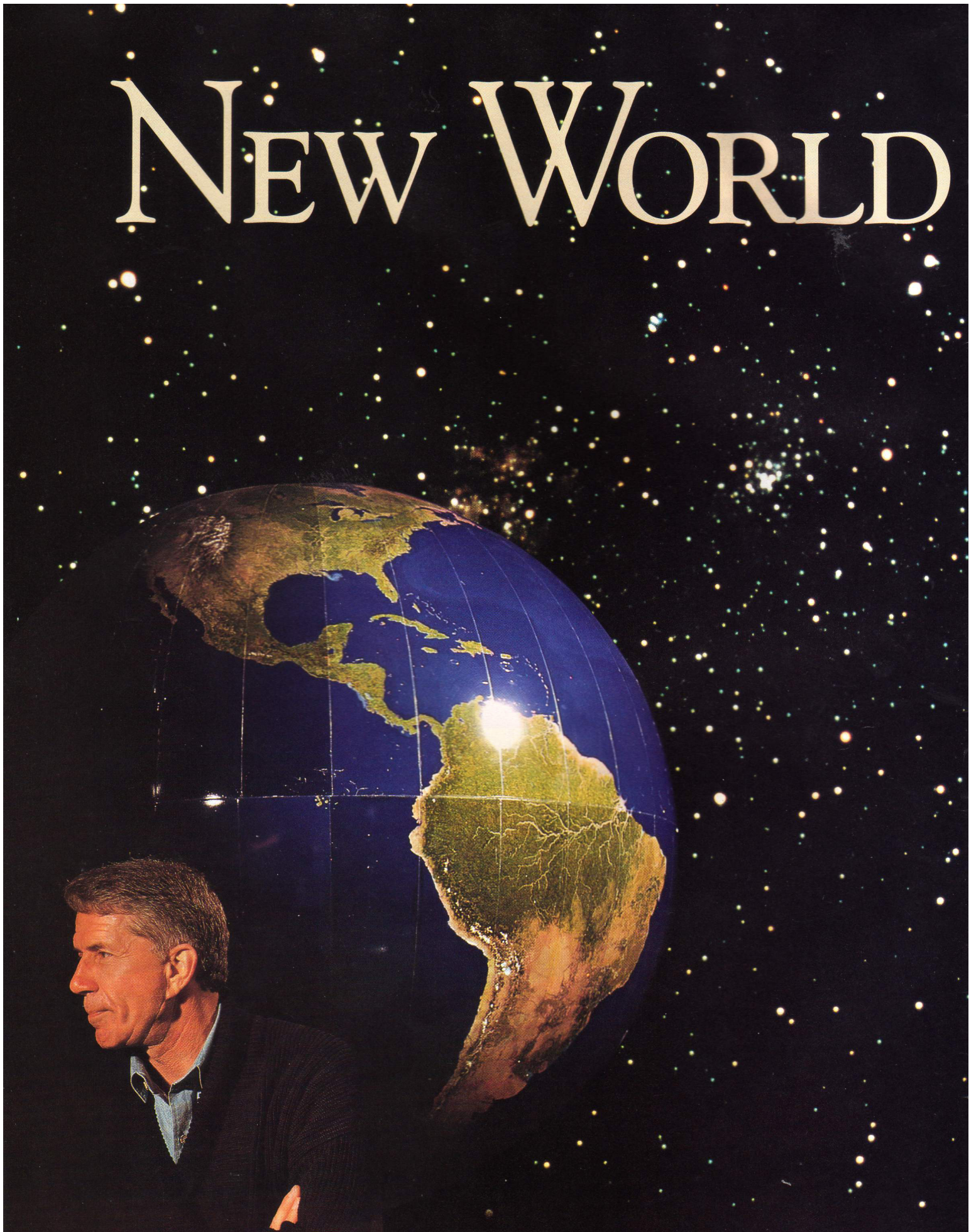
THE REAL WORLD

The Brave, New Look of GeoSphere



**ENCHANTED FOREST:
THE SORCERY OF ANGEL FALLS**
**EAGLES AGAINST THE SUN:
THE DOOLITTLE RAID**
**CHORAL SOCIETY:
MAUI'S GLEEFUL HUMPBACKS**

NEW WORLD



VIEW



HE ARTIST TOM VAN SANT WORKS IN broad strokes and in strokes exceedingly fine. Van Sant is a monumental minimalist. He is creator of the largest drawing ever made, and he is creator of the smallest.

The largest drawing, "Reflections from Earth," was accomplished with mirrors on June 11, 1980, in the California desert. Van Sant's principal collaborator—for the first time, but not the last—was inhuman: an intelligent and perceptive machine orbiting the near edge of eternal space. Working at the base of Shadow Mountain, Van Sant and a small team of assistants arranged ninety mirrors in the shape of an eye. The mirrors were each twenty-four inches square, each set two hundred yards apart, and each precisely angled to one-tenth of one degree. Van Sant was laying an ambush for Landsat 11. As he and his crew labored in the desert heat, squinting, their faces dazzlingly lit from below by the mirrors, the satellite was making its endless, meteoric rounds six hundred miles above Earth, heading toward Shadow Mountain at 22,000 miles per hour.

Van Sant intended to shine his artwork into Landsat's eye, just as a bored boy with a piece of mirror lights up the face of his older sister. The satellite, unlike the sister, was incapable of irritation, but otherwise the principle was the same. The glare from each mirror appeared to Landsat as several acres of white light. The bright eye that the satellite photographed winking back from the desert was 1.4 miles across. The eye was not quite perfect. A small part of the composition failed to catch the sun. When the team investigated afterward, they found three mirrors knocked off their pedestals, and jackrabbit tracks on the immaculate glass. The rabbit had altered the composition, providing the finishing

*Not since the Creation has
there been globe-making
like Tom Van Sant's
GeoSphere. Not since
Galileo has there been
such a world of difference
in looking at the earth.*

BY
KENNETH
BROWER



HANK MORGAN



HANK MORGAN

"Ryan's Eye," the world's smallest drawing (top), was etched on one facet of a salt crystal. **"Reflections From Earth,"** the largest, was done with mirrors in the desert.

of a salt crystal, the brush an ultra-small-focused electron beam. The eye is just one-quarter of a micron wide, its pupil only about a hundred atoms across. The twenty-four volumes of the Encyclopedia Britannica, if set in letters the size of "Ryan's Eye," would fit on the head of a pin, leaving plenty of room for angels to dance. "Ryan's Eye" is ten billion times smaller than the Shadow Mountain Eye.

The eyes of the artist, meanwhile, were steadily growing dim. "My sight was getting blurrier and blurrier," Van Sant told me

touch. It had left its signature in the middle of the piece.

The smallest drawing ever, "Ryan's Eye," was made by a scanning electron microscope at Cornell University on April 1, 1982. The canvas was one facet

bells and lights. To adhere to the Geneva Convention, they didn't torture them, but this was another kind of distress. I saw that after several days, or a week, the subjects would become emotionally very unstable. It seemed effective in generating information."

To save Van Sant's eyes, his doctors were proposing exactly the same regimen.

"The only prospect of successful treatment was the topical administration of five antibiotics every half-hour for about ten days. Just flood the eyes with everything you can think of. The nurses who were going to have to administer this program weren't enthusiastic about it. All their patients started doing what the Greek Cypriots did—throwing things, and so on. I didn't feel prepared to do that. I decided to meditate. Meditation had been a part of my life. But I'm a Western man, certainly, and not an Eastern mystic. A ten-day meditation is not something I'd normally do." Van Sant laughed at the understatement. "But I decided that was what I'd do

recently, "and then I couldn't see anymore."

Tom Van Sant is sixty. He speaks in a slow, measured way that belongs somewhere in the heartland, not in Southern California, where in fact he grew up. His face is expressive, but the expressions take their time.

"So I waited for a donor," Van Sant continued. "I had a cornea transplant. The operation had all the prospects of being successful. Then infection set in. The first infection was cured, but it came back, and I was in jeopardy of losing my eyes."

Van Sant's matter-of-factness in recounting this brush with blindness struck me as strange. "The prospect of your sight going," I said, "that's the worst possible scenario in an artist's life, no?"

"Well," said Van Sant. He paused. "I think it's safe to say that an artist without eyesight becomes a different person."

His gaze was fixed in an unfocused way. He was staring, I supposed, into those different things he would have done as a blind man. In his relief over retaining his sight, I guessed, there had been a tiny disappointment.

"And does different things," he concluded.

"I had done a stint as a correspondent and combat artist after being in the service," Van Sant went on, "and one of my adventures was to Cypress in 1957, during the Greek-Turk-British war. The British would take Greek prisoners and wake them up every half-hour with

with this time. Rather than attempt to sleep, I would relinquish sleep as a goal. I would accept a meditative state for those ten days.

"So we left the bed in the upright position, and that's what I did. It's an extraordinary experience. By the second day, there was no longer any effort to dismiss the movie that we play in our heads—the movie about the past or the future. There weren't even any thoughts left to dismiss. I had this extraordinary experience of being truly in neutral gear. When the period ended, I was quite content to stay there. I wasn't all that enthusiastic about getting back involved with the world. But when I did, something very surprising was there. And that was an inability to pay much attention to anything else but the GeoSphere Project."

The GeoSphere Project—as Van Sant dreamed it, and as it came to be—is nothing less than the first faithful three-dimensional model of Earth. On the surface of the sphere, and at the heart of the idea, is the GeoSphere Image, a composite, cloud-free picture of Earth taken by satellites of the National Oceanic and Atmospheric Administration (NOAA). Transferred to photographic emulsion, it covers the translucent fiberglass of the GeoSphere globe. In full resolution, the image is 8,640 pixels wide by 4,320 pixels high—a mosaic of 37.3 million true-color pixels. A pixel at the equator represents a region 4.6 kilometers wide. The image—so detailed that 338 television sets in twenty-six stacks of thirteen would be required to show it—took ten months, 2,400 man-hours, and \$600,000 to assemble. Many of the man-hours came out of Van Sant's own nights. Much of the \$600,000 came out of his own pocket.

"I love everything that has to do with the sky," he told me. "And I love looking at the Earth from above. I was in great distress over the deterioration of Earth's resources. Particularly tropical forest and the resources of the ocean. Ozone depletion. Loss of species habitat, and then loss of species. It seemed that the prospects for turning around man's attitude toward nature were bad. I realized there were no shortcuts. Lobbying decision-makers doesn't work unless you can inform their constituents. There seemed no alternative except the education of everyone."

"It was from this that the vision of the GeoSphere Project began to emerge. I had been frustrated that no one seemed interested in making a satellite composite view of the Earth—our first *reality* model. Our first *icon* of the Earth. I was frustrated, too, that each satellite scientist was selecting his own color-coding to explain whatever visualization he made. The codes were all so complex. They weren't communicating."

"It was in the hospital that I began to visualize the whole GeoSphere system. A whole new level of scientific visualization—not a level of more complexity, but more simplicity. The key was in removing secondary symbolism, removing color-coding, removing these levels of language that you had to master before you could understand the issues. The issues were straightforward."

A realistic portrait of Earth, all symbolism banished, was just the beginning of Van Sant's dream. The GeoSphere, he decided, would be surrounded by a transparent shell upon which the ceaseless motion of the clouds would be projected. An internal projection system would display various habitats, or animate the migration routes of whales and birds, or compress—in the manner of time-lapse photography—the shrinking of the world's rainforests, or the spread of oil spills. On all Earth's actual continents, Earth Situation Rooms would be established, each with its GeoSphere, and each

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receiving and processing visualizations built on global databases. The GeoSpheres would elucidate global patterns and exigencies that mankind—from the limitations of our earth-bound perceptions, or from the confusion of color-coding—seems unable to grasp.

Five years ago, in French Guiana, I had asked a tropical botanist, Professor Francis Hallé, how it had felt as a young man to work hard at becoming expert on an ecosystem that was doomed. "But I didn't know!" Hallé had answered. The botanist had traveled everywhere in the tropics, had seen rainforest vanish here and there, but had not, until the early 1980s, realized the global scale of the destruction. He had not put the pieces together. It is this sort of failure in scope that the GeoSphere is designed to remedy. When the GeoSphere's projection system is completed, the big picture will be much harder to miss.

From the fountainhead of Tom Van Sant—half-blind, sleepless, streaming antibiotic tears, the GeoSphere sprang in all its particulars. He had toyed with elements of the idea, but only now did the parts fall into place. The

GeoSphere emerged, like Athena from the brow of Zeus.

Van Sant sold the lot upon which he had been planning to build a dream house of his own design. "What use is a house," Thoreau once asked, "if you haven't got a tolerable planet to put it on?" Van Sant seems to have asked himself the same question. With the proceeds, he bought a \$200,000 Stardent GS 1000 Graphics Supercomputer. He and his son, Ryan, moved into a Santa Monica garage apartment, and work on GeoSphere began.



THE ASSEMBLY OF THE GEOSPHERE IMAGE, AS IT HAPPENED, WAS already under way. For nearly two years, at the Jet Propulsion Laboratory in Pasadena, a computer scientist named Lloyd Van Warren had been compiling in his spare time what he called the "Whole-Earth Database." Van Warren could not understand why people were so curious about the look of other planets, so incurious about their own. He worked late into the night, gathering and integrating data from remote-sensing satellites, so that one day he could view on his screen any point on the planet from any perspective. His was the digital, cathode-beam version of what Van Sant wanted to represent on a sphere. His compulsion unsettled his supervisors, worried his wife, and puzzled Van Warren himself. Then one day Van Sant telephoned. "Suddenly I knew why I was doing this," Van Warren has said.

Van Sant scanned five years of satellite data for cloud-free pictures of every four-kilometer section of Earth, then fed digital tapes of each image into the Stardent. Van Sant, Van Warren, and their colleague Erik Bruhwiler worked in shifts to keep the Stardent busy twenty-four hours a day, compositing sixteen satellite passes to make a single whole-Earth mosaic: a satellite portrait of a day in the life of Earth. They then composited five more days, for a total of six—the Biblical standard for this sort of creation. At the end of the sixth day, they did not rest. One-fourth of the planet in their master image remained obscured by clouds. Van Sant moved into the NOAA Library in Silver Spring, Maryland, and spent weeks looking for make-up photos. In old black-and-white satellite negatives, shaken out of dog-eared envelopes, he searched for desiccation. In places, desiccation eluded him.



GARY MOSS
SCOTT HAYO

After ten sleepless days in the hospital, suffering treatment to save his sight, Tom Van Sant began to envision the GeoSphere. Behind him—the composite image.

found all of the Kola Peninsula. Southern New Zealand. I know a lot of good places to go if you don't want a suntan." In the end, a stubborn 4 percent of the master image was obscured by clouds. Van Sant filled in the holes with grafts of tundra or jungle nearby. Such patchwork is hard to quibble with. I once walked across Alaska's North Slope, and for weeks nothing changed.

Acceptance of the GeoSphere Image by the remote-sensing fraternity came grudgingly. When Dr. Lothar Beckel, a guru of the European chapter of that fraternity, presented the image at an international conference, the viewers—accustomed to infrared imagery that shows vegetation as red—balked. "We can't accept the green," one man summarized. "It's too much a departure from reality." Dr. Beckel had the good sense not to respond. He let the comment sink in. In the back of the room someone laughed. Soon the whole room was laughing.

"The rainforests of Africa and the Amazon and the Malaysian Archipelago hold clouds above them," he told me. "Central America is the same way. Northern Russia and Siberia. The Kola Peninsula—I don't think I ever

The European Space Agency has adopted Van Sant's image as the official image for its *Global Change Atlas*. Both a GeoSphere and the prototype of the Earth Situation Room are to be displayed at the Earth Summit in Rio de Janeiro, not as an exhibit, but a tool for the delegates grappling with Earth's environmental problems. It will be the only display in the forum where the delegates meet.



THE EYES ON EARTH OFFICE, HEADQUARTERS FOR THE GEOSPHERE Project, is in a converted restaurant in Santa Monica. Against one wall is a bank of three computers, screens aglow. Against another is a bookshelf topped by a row of globes in all sizes and colors. Little beanbag globes. Globes stuffed with kapok, like teddy bears. Four or five illuminated globes, the kind with a bulb inside, all at the moment unplugged. Softball-size globes of ancient Greek cartography. (The continents that Strabo and Ptolemy charted are as strangely shaped and otherworldly as Gondwana or any other of the precursor continents of modern theory.) There is a tiny Victorian globe that rotates within the equatorial rail of a wooden stand—a miniature of the sort of globe that Charles Darwin must have given an occasional spin in his study—and a golfball-size,

wind-up globe that walks around on big yellow feet.

The office is a geocentric universe. At the middle of the room, orbited by all the little globes, sits the seven-foot GeoSphere.

Its first lesson is taught by omission. I realized on approaching the big globe how much of the world's beauty is in its clouds. There was never a day on Earth like the cloudless composite of the GeoSphere image, and we can hope there never will be. If global warming were sudden, instead of gradual, and if a day of grace passed before the planet's greens turned brown, then the world might look like this. Over Van Sant's dry Earth, clouds will someday swirl. Live weather patterns will be projected by direct feed from global weather satellites. Van Sant's first priority, however, has been to develop *internal* projection. For the prototype of the Earth Situation Room to be displayed in Rio, Van Sant's people are busy testing three small lasers and activated mirrors that, from inside the globe, will project migration routes and habitats on the surface. Weather will have to wait.

The GeoSphere began to take hold of me.

There is something about a really big globe. My relationship to the surface began to feel like an astronaut's—blue ocean under my nose, the curving margins of the planet way out on the periphery of vision. The globe nearly became the world. It developed almost a gravitational pull.

In the sixteenth century, pilgrims were drawn from all over Europe to see the six-foot globe built by the Danish astronomer Tycho Brahe. In the seventeenth century, all the courtiers, sycophants, and powdered ladies at Versailles were pulled in by the twin fifteen-foot globes created by a Venetian monk and globe-maker, P. Vincenzo Coronelli, for Louis XIV. In 1664, Louis XIV's contemporary, Duke Frederick of Holstein-Gottorp, built an eleven-foot globe with a portal that drew as many as a dozen onlookers inside. The exterior of Holstein-Gottorp's planet showed the continents, the interior showed the heavens. These innovative globe-makers and their brethren—Ptolemy, Strabo, the great Gerardus Mercator—are direct antecedents of Tom Van Sant.

Each added a wrinkle to the art. Mercator contributed his projections. Johann Shoner, in 1543, first showed America as a continent instead of an archipelago. James Ferguson, with a fine Scot stinginess, miniaturized the art by producing pocket-size globes that gentlemen carried in black leather cases, which on the inside showed the constellations. Tom Van Sant, in all the mincing, pixel-size steps of his image building, has taken a giant step for globe-making. Where previous globes are all artifact, covered with a cartographic graffiti of place names, national boundaries, and arbitrary colors, Van Sant's globe shows the planet as it actually looks on a clear day. When his projection systems are refined, the GeoSphere will come alive—another giant step. It will be difficult to make a better world, short of another seven days of labor by the Globe-maker Himself.

I am six feet tall, which put the GeoSphere's equator close to eye level. I hung there a while, just above Africa in geostatic orbit. The realities of the Earth came home to me as they never had in the vicinity of any conventional globe. I realized, with a shock, how high Europe perches on the planet. And Scandinavia! When you loiter near the equator of a seven-foot globe, Norway and Sweden are missing—gone over the deep curve of the horizon. I realized not only how big Africa is, but how much of it lies above the equator. I had known these things, I suppose, but they had never filled my awareness in quite this way.

I left geostatic orbit and strolled westward. It struck me that all the geography we think of as superlative shows up on the GeoSphere as superlative indeed. The Sahara! What a giant piece of the planet that desert occupies. The Amazon! What a basin, what a drainage system, what a river. The Himalayas! The Pacific! The power of the GeoSphere was partly in the dynamic of its size, partly in the truth of its colors. I had flown over the Sahara two months before and remembered a featureless field of beige light

passing for hours below. Passing over the subtle colors of Van Sant's desert was very close to the actual experience.

Circumambulating the globe, I arrived once again over Africa. Striding more briskly, I reached escape velocity. My momentum carried me on a parabolic route around the office. Sculpture by Van Sant lay everywhere. A poster rack along one wall displayed depictions of his art. Tacked to one board were sketches from Jordan that the *Los Angeles Times* had commissioned in the 1950s: a pair of camels, a caravan, a veiled dancer, a hungry refugee, a young King Hussein (the king had fewer cares in those days, from the look of him), and the king's Camel Corps—border guards in flowing robes, galloping and waving their rifles. Van Sant draws very well. I was surprised. Artists attracted to conceptual work are seldom good with a pencil.

Several boards showed photographs of sculptures from a series inspired, I think, by the duck decoy: owls, gulls, grebes, sea birds of unpainted wood. Why, the artist must have asked himself, does a decoy always have to be a duck? This wooden avifauna was the answer. Other boards showed murals of religious subjects influenced by Byzantine mosaics. Van Sant's murals, like those of the old basilicas, were entirely composed of irregular fragments of colored glass and stone—the Byzantine equivalent of the pixel. Yet another board showed a sculpted concrete mural of a pair of lionesses, inspired perhaps by those stone lions the Assyrians carved in the sunken relief called *intaglio*. Van Sant arrives at his own *intaglio* by a process he invented. He carves his shapes into molds of polystyrene, which he inserts directly into the contractor's forms. Among other depictions of his work I found: a headless, armless torso of fractured rock that seemed to owe an equal debt to the Venus de Milo and stream conglomerate; murals that borrowed motifs from Haida art; kites with angry vis-

The agenda for what promises to be history's largest gathering of heads of state is suitably grand: No less a matter than the state of the planet will be weighed next month when representatives from 150 nations convene in Brazil for the United Nations Conference on Environment and Development (UNCED)—better known as the Earth Summit.

UNCED (pronounced "un-said") grew out of a General Assembly resolution calling for another gathering like 1972's Stockholm Conference on the Human Environment—an ecological turning point. For the first time, delegates began to perceive themselves as citizens of Earth, responsible for its security.

Since then, however, the state of the earth has only worsened. By the late 1980s, the UN decided not only to measure what had been achieved since Stockholm, but to try to reverse the damage by encouraging growth that doesn't degrade the planet's resources—what environmentalists call *sustainable development*.

When the delegates meet in Rio de Janeiro from June 1-12, they will put the finishing touches—and their signatures—on agreements drawn up during four preliminary meetings. Under way since 1990, the negotiations have pitted developed and developing nations against each other—an unavoidable conflict, perhaps, given the goals of the conference: to create an Earth Charter for the planet's future; to sign treaties on climatic change and biological diversity; to develop a plan for achieving sustainable development in the next century, and agree on the mechanisms to finance it; and to agree on the equal transfer of environmentally sound technology throughout the world.

While delegates will differ over solutions, the Earth Summit nonetheless marks a milestone: universal agreement that there is a problem.

For information on getting involved with UNCED's work, write: U.S. Citizens Network on UNCED, 300 Broadway, Suite 39, San Francisco, California 94133. Or call (415) 956-6162.

—Tim Knipe



PATRICIO ROBLES GIL/BRUCE COLEMAN

For the first time, GeoSphere will show Earth in its stark, true colors: brown where rainforest is disappearing, beige where desert is encroaching. Even the migrations of such great, wild menageries as the caribou will be tracked, not merely imagined.



ERIC MOJALA/IMAGE BANK



JAMES FALOG/BRUCE COLEMAN

ages inspired, I suppose, by Chinese fighting kites.

Flipping through the rack, trying to summarize this work, I came up with a formula: nothing distinguishes the art of Tom Van Sant. That is to say, no one thing distinguishes it. If his oeuvre is remarkable for any one trait, it is range. His influences come from everywhere—Byzantium, the Haida lodge, the duck decoy. He has not hesitated to cross the boundary between art and science. Indeed, he has worked that border like a smuggler, salting back and forth across it in his creation of “Reflections from Earth,” “Ryan’s Eye,” the GeoSphere itself. The late Richard Feynman, Nobel laureate in physics, was a friend of Van Sant’s who helped in the calculations for Ryan’s Eye. “Tom Van Sant,” the great physicist once said, “is the only truly modern artist I know.” Van Sant has worked in bronze, steel, aluminum, titanium, concrete, stone, oil, acrylic, enamel on copper, glazed ceramic tile, Hawaiian tapa cloth, stained glass, among other materials. He has not been content, as Braque was, to paint nothing but little dead fish. He has not exhausted all the possibilities in lily pads, as Monet did at Giverny. His career has flouted conventional wisdom, which holds that an artist, to be taken seriously, should find a vein and work it to death. That is a Van Gogh, one knows with fair certainty. “Is *that* a Van Sant?” the viewer keeps asking.



I WAS DRAWN BACK TO THE GeoSphere like an errant

comet. This time, passing over South America, I was struck by the great plume of sediment at the mouth of the Amazon. If the GeoSphere has eliminated the artifice of national boundaries and colors, it has added genuine features that other globes neglect. Plumes of river sediment are real, permanent features of the planet. Some are larger than whole nations. Most are rapidly growing, carrying ever more mainland in suspension. The plume of the Ganges is redistributing the Himalayas as the roof of the world is deforested, its soils washed away. The Mississippi is carrying away increasing volumes of the Great Plains. The Amazon, always a colossal conveyor of sediment, is burdened by ever heavier loads as its rainforests are burned and logged, as its tributaries are mined hydraulically for gold.

The plume of the Amazon represented more than just sediment, I realized. The Amazon basin is the most species-rich province on Earth. With deforestation, dozens of Amazonian species are passing daily into extinction. There is a great outflow of lost genes down the Amazon and its tributaries. Ebbing with those genes is a detritus of lost myths, customs, songs, and pharmacopeias from the hundreds of Indian tribes exterminated in the destruction of the rainforest. That genocide continues as gold miners and settlers shoot the Yanomami and other tribes newly contacted, and as Western diseases kill them. Whole world views and alternative universes, atomized by contact with Western greed, flow as dust down the river, mixing with the plume.

"When you try to pick out anything by itself," John Muir wrote, "you find it hitched to everything else in the Universe." Losses in the Amazon have a ripple effect that touch us all. Some of the most promising treatments for cancer, for example, have been discovered in rainforest plants. Less than one percent of these plants have been analyzed for their curative properties. Cancer cures are ebbing down the Amazon and mixing with the plume.

In the risk projection programs that Van Sant plans for the GeoSphere, laser shows will compress history, mapping the rainforest as it existed in 1900, showing its extent today, then projecting its extent in 2010. The show will end at about 2050, when, according to the best estimates, tropical rainforest will have ceased to exist. As the forest declines and the river plumes grow on the GeoSphere, perhaps little lights should wink out in other hemispheres—humans dying from diseases for which we have sacrificed the cures.

Over Africa, I ruminated on the unhappy phrase "Dark Continent." Bright Continent is more like it. The pale sands of the Sahara give Africa a higher albedo than any landmass save Antarctica. Only a swath of middle Africa is a dark Congo green. When we think of African desertification, we think of the spread southward of the Sahara and Sahel. We forget the Namib, the Kalahari, and the other great deserts below the Horn. The GeoSphere told the truth: the browns and beiges of desert are encroaching on the African rainforest from both sides.


I lingered briefly in Malaysian Borneo, in the state of Sarawak, where tropical rainforest is disappearing faster than anyplace on Earth. Twenty years ago I lived there for a time in an Iban longhouse. The Iban men, slight but wiry, wore earrings and had flower blossoms tattooed on their backs. The women were tiny, tough, and lovely. I slept on a mat below nets full of skulls from the days when the Ibans were headhunters. Each small, smiling woman swayed with her skulls down the long floor. That longhouse, its people, the surrounding forest, are almost surely gone.

Heading home to North America, I replayed the deforestation of that continent. The deforestation continues. Even as we lament Brazilian greed in the Amazon, our own loggers are working hard to eradicate the last ancient forests of the North. Looking eastward, I followed imaginary caribou across the GeoSphere's tundra, having once intersected that route with a migration of my own. Now that the bison are gone, the caribou make the greatest American herds. They in their turn are diminishing. I dallied

above Quebec to admire the great maw of the St. Lawrence, and remembered the pods of belugas here. Tom Van Sant, composing his image of the river pixel by pixel, had guessed correctly at the post-glacial deluge that created this flow-way. Now the belugas here are contaminated by extraordinarily high levels of pesticides and PCBs. What the St. Lawrence needs, perhaps, is another ice age, another deluge to flush it clean.

Remembering the Humboldt Current and its living river of anchovies, I swung south again across the equator. I traced that cold current and its silvery, inexhaustible, living river, up the South American coast, parallel to Van Sant's cloudless cordilleras. The inexhaustible river had proved exhaustible after all. Overfishing and El Niño have dried it to a trickle. Moving up to California, I found the waters of the northern analogue of the anchovy—the sardine, fished out in the 1940s.

From their breeding lagoons in Baja, I followed the spring migration of the gray whales north to the Bering Sea. The gray whale is headed in the opposite direction, figuratively, from the bison, the anchovy, and the sardine. Reduced by whaling to two or three thousand animals, the population has rebounded with protection and now numbers around 22,000. Nature is resilient, given any sort of reprieve.

"It's only a little planet, but how beautiful it is," the poet Robinson Jeffers wrote. Jeffers was right. Standing back from the GeoSphere, I felt a patriotism for Earth. It is the only kind of chauvinism that makes any sense. The GeoSphere was beautiful. I recognized it as a Van Sant. 

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Kenneth Brower has written for Audubon, Smithsonian, National Geographic, and The Atlantic, and is the author and editor of two dozen books on ecology. He wrote about old-growth forests in the December 1991 issue of TDC.



**VIEW
MORE
ABOUT IT**

STATE OF THE NATURAL WORLD

As ministers and monarchs prepare for the Earth Summit, The Discovery Channel presents a U.S. premiere mini-series on the ecological perils they confront.

WITH THE BEST INTENTIONS

From reaping rainforest profits to paving the way for the Olympic torch, altruistic ideas often go astray.

► Monday, May 25 • 10 p.m. and 2 a.m.

AT OUR MERCY

In the wild and in the zoo, many species are subject to human caprice—sometimes wisely benevolent, often unknowingly malignant.

► Tuesday, May 26 • 10 p.m. and 2 a.m.

TOO RICH, TOO POOR

While many affluent nations have exploited nature, some impoverished countries have been abused by it. Sharing ecological wealth may be crucial to balancing material fortunes.

► Wednesday, May 27 • 10 p.m. and 2 a.m.

FORBIDDEN GROUND

Through wartime blitzes and nuclear mishaps, man has ravaged the very lands he has fought over. Can nature reclaim what we have ruined?

► Thursday, May 28 • 10 p.m. and 2 a.m.

THROWING IT ALL AWAY

To cleanse the earth of synthetic poisons, man must kick his addiction to chlorine. Meanwhile, recycling may help cure the solid-waste plague.

► Friday, May 29 • 10 p.m. and 2 a.m.

All Times Eastern