At MECO I silently celebrated life. For the first time in what seemed an age, it occurred to me that I might live long enough to die a natural death.

We went to work on our mission activities, most of which I'm forbidden to describe. But the classified nature of both my DOD missions produced a mighty temptation for me. Riches and fame beyond anything any astronaut has ever achieved could be mine if I just told the world thetruth …that on these hush-hush missions we actually rendezvoused with aliens. Given the vast population of conspiracy theorists, my claims would not be questioned. "Of course the government is hiding contact with aliens under the guise of military space shuttle operations," they would shout. I would be their hero for revealing what they have long suspected. Book and movie deals would net me millions. I would just need a convincing sperm-extraction and anal-probe story for my Barbara Walters interview…and to be able to look pained and violated as I told it.

On one occasion since leaving NASA, I did publicly make the "alien rendezvous" claim. I did it at Pepe's retirement ceremony. "Yes, we linked up with aliens," I told that audience, "and then had sex with them. It wasn't too bad after we got by the tentacles. Of course, Pepe, being a navy guy, picked the ugliest one."

One unclassified experiment aboardAtlantis proved immensely entertaining—a human skull loaded with radiation dosimeters. After returning to Earth those dosimeters would yield an exact measure of how much radiation was penetrating the brains of astronauts.

To reduce the creepiness factor of the experiment, the investigators had used a plastic filling to give the head an approximation of a face. The result was far more menacing than plain bone would have been. The face was narrow, cadaverous, with two bolts at the back of the skull looking like horns. Satan himself was riding with us. During a break in our payload work, I floated into a sleep restraint and extended my arms through the armholes, then ducked my head into the bag. Pepe and Dave taped the skull on top of the restraint so it appeared our friend had a body. (Your tax dollars at work.) They silently floated the bag to the flight deck and maneuvered me behind John Casper, who was engaged at an instrument panel. When he turned to find the creature in his face with arms waving, it scared the bejesus out of him. Later, we clamped Satan on the toilet. No doubt my desecration of the poor anonymous soul who had volunteered his body (and skull) to science has earned me a few more millennia in hell's fires.

With STS-36 I dodged the SAS bullet for the third time. Maybe, I thought, God had given me a free pass in space because I had vomited enough for ten men in the backseat of the F-4 during my early flying career. Whatever the reason, I was happy to stow my unused barf bag. John Casper looked as if he might need it, but maybe not for SAS. It could have been his meal of eggplant and tomatoes. Gag. The NASA dietician included it because John's other meal choices (heavy on butter cookies, M&Ms, and chocolate pudding) would leave him short of magnesium. I would have rather chewed on a magnesium flare. John hadn't eaten the entrails-looking dish, but just rehydrating it would have made me sick. Regardless of the cause, John was feeling poorly and called on Dave Hilmers to inject him with the antinausea drug Phenergan. NASA had all but given up on patches and pills to treat SAS and had converted to industrial-strength injectable drugs. I reminded John of the warning the potion carried, "Do not operate an automobile under the influence of this drug." He replied, "Lucky for me it doesn't say anything about operating a space shuttle."

Dave Hilmers was no doctor. He just played one in space. His premission training with needles had consisted of jabbing one into a piece of fruit. I would have to have been near death before I would have let a marine come near me with a needle. I expected to see blood and I wasn't disappointed. Dave accidentally moved the needle while it was embedded in John's ass and blood followed. A line of ruby planets shot from the wound like soap bubbles being blown out of a ring (giving new meaning to the term "airborne pathogen"). We chased the spheres with tissues. (Dave Hilmers must have been inspired by his needle work. After retirement from NASA he completed medical school and is now a pediatrician with a practice in Houston.)

While I had no nausea, I did experience the same painful backache from spine lengthening that I had encountered on STS-41D and 27. I also noticed the same Viagra effect. Every morning I would find myself painfully afflicted with a diamond-cutter erection, just like the geezers in the movieCocoon. And I wasn't the only one dealing with this problem. On one reveille, as we all floated in our sleep restraints, Pepe looked at me and said, "I must have had a great dream about Cheryl [his "snort" cute wife]. I've got a terrific boner."

I smiled and replied, "I must have had a great dream about Cheryl, too."

Pepe laughed. "Damn you, Mullane! Keep my wife out of that filthy brain of yours."

Someday the blood shift of weightless flight will make for some very happy space colonists.

During the last sleep period of the mission, I stayed awake in the upper cockpit to soak up the space sights that would have to last the rest of my terrestrial life. I wanted to listen to music as I did so and searched for my NASA-supplied Walkman. It took me a

moment to find it. The inside of the cockpit was covered with Velcro pads, and everything we carried, from pencils to cameras to food containers to flashlights, had Velcro “hooks” glued to them so they could be anchored to a pad. The only problem was remembering where you anchored everything. On Earth, nobody ever had to look on a wall or ceiling for a misplaced item. In space you did.

I put on headphones and inserted one of my personal-mix music tapes in the player (NASA allowed us six), then switched off the cockpit lights. Floating horizontally, I rolled belly up and pulled forward until my head was nearly touching a forward cockpit window. It was a trick Hank Hartsfield had taught me on STS-41D. WithAtlantis in a ceiling-to-Earth attitude, my orientation had me lying facedown toward Earth. Though this attitude caused my body to brush against the ceiling instrument panels, which contained some of the most critical shuttle switches, I wasn’t worried about bumping one out of position. All the switches were set between two wire wickets so they could only be accessed by a thumb and forefinger inserted between those hoops.

The real joy of my new position was the illusion it created. I could put my head so far forward that the shuttle’s structure disappeared behind me. My view of Earth was completely unobstructed. It brought back memories of snorkeling in the Aegean Sea and watching the undersea life through my face mask. As I had then, I now had a powerful sense of being part of the element in which I was immersed, not a foreign visitor. When I steadied myself with my fingertips and then pulled those away, I would momentarily float free of any contact withAtlantis, enhancing the sensation of being a creature of space, not an astronaut locked in a machine.

To the strings of Beethoven’s “Ode to Joy” I watched my planet silently move under me. But this time I was seeing it as never before. Not only was our orbit steeply tilted to the equator, we were also in one of the lowest orbits ever flown by a space shuttle. We were scarcely 130 statute miles above the Earth, approximately the distance from New York City to the eastern tip of Long Island, or Los Angeles to San Deigo. At this altitude the planet was hugely close and there were new details of its earth, sea, and sky to thrill me.

I could see the patina of the Earth’s oceans. The wind-rumpled water gave them the texture of an orange rind, but in colors that varied with the angle at which the Sun stuck them. At high sun, the open seas were Crayola blue. At grazing angles, they reflected tones of gray and silver and copper. In places of exceptional water clarity, like the Caribbean, the dunelike humps and valleys of the seafloor were clearly visible, their white sand diluting the ocean blue to yield a striking turquoise. In the sheen of the Sun I could see evidence of the dynamics of the sea. There were circular eddies similar to the low-pressure-cloud swirls in the atmosphere. Boundaries between currents appeared as dark lines. Currents past headlands would create noticeably different downstream wave patterns, exactly like the ones I could see in clouds

downstream from mountain ranges. In Persian Gulf anchorages I could make out the “dots” of supertankers and occasionally, in the glint of the Sun, I would catch sight of the V-shaped wake of one of these monsters under way. Later, asAtlantis was on the descending portion of an orbit deep into the southern hemisphere, I watched the miles-long bluish-green ribbon of a bloom of plankton. We had been told to expect to see these in the fertile waters approaching Antarctica. Farther south, a flotilla of icebergs sailed on currents like so many ships of the line.

At the southern limit of her orbit,Atlantis ’s nadir came within three hundred miles of the coast of the Antarctic continent, now in late summer. I pulled a pair of gyroscopically stabilized binoculars from their Velcro anchor and peered southward. The pole was nearly 1,800 miles distant, so I had no view of it. Instead, I focused on the rugged coastal mountain chains. The occasional black of a windswept cliff was the only color in an otherwise sheet-white topography.

Atlantiscurved northward and began her 12,000-mile fall toward the opposite end of the Earth. It was a remarkable physics that kept me on this godly merry-go-round. We were literally falling. Just as a thrown ball falls in a curve,Atlantis was on a curving trajectory to impact Earth. But impact never came because the Earth’s horizon was continually bending out of the way.Atlantis ’s engines had thrown her onto a falling curve that matched the curvature of the Earth. In my upper-cockpit perch, I had no sense of that fall but in the windowless mid-deck I had experienced brief moments in which the sensation had been overwhelmingly powerful. The day before, I had been seized with an illusion that the mid-deck cockpit floor was steeply tilted and if I didn’t grasp something I would slide down it. Try as I might I could not convince myself that I would not fall. I actually seized the canvas loop of a foot restraint to keep from sliding off my imaginary cliff. The sensation was so distracting I finally abandoned the mid-deck and floated upstairs. The view of the Earth’s horizon immediately eradicated any sense of the fall.

The ocean underAtlantis was now the Pacific. The sun dropped and its terminator light painted a scattering of cumulus clouds in coral pink. In the darkness that followed I looked spaceward to the unfamiliar stars of the southern hemisphere. The Magellanic Clouds were visible as hazy smudges. A quarter moon rose. Seen through the thick part of the atmosphere, the orb was severely distorted, appearing boomerang in shape, an effect of the light-bending qualities of the air. The crescent tips were squeezed inward and the greater surface bulged outward. Only after rising above the atmosphere did the crescent appear normal. Then, it cast a spotlight of silver across the water. Except for its grand scale, the sight was identical to watching the moon rise over the sea from a Cape Canaveral beach.

Just twenty-two minutes after leaving Antarctica’s seas,Atlantis passed over the equator and I was treated to the never-ending light show of the intertropical convergence zone. Here, the trade winds of the northern and southern hemispheres

mixed in equatorial heat and humidity to produce perpetual thunderstorms. The nimbus clouds took on the appearance of sputtering fluorescent lightbulbs, so continuous was the lightning within them.

Atlantiscrossed Central America in less than a minute and I looked ahead to America's East Coast. In a six-minute passage, the city lights of the entire seaboard passed by my window: Key West, Miami, Jacksonville, the cities of the mid-Atlantic, then Washington, D.C., Philadelphia, New York, Boston, and Portland. The lights sprawled over the darkened continent like so many yellow galaxies.

Twenty-two minutes north of the equator,Atlantis brushed the Arctic Circle. The deep night of winter in the northern hemisphere made it ideal for viewing the lights of the aurora borealis. I watched them grow and collapse in their ephemeral, spiritlike dance. Streamers of emerald green and fuchsia waved as if rippled by the wind. The lower end of one curtain took on an intense glow, like the head of a comet, its attached streamer trailing away like a sun-blown tail. The lights were so captivating I watched them until they were just a haze on the receding horizon, and I was happy to know I had tickets for the next show starting in ninety minutes.

I moved to the back cockpit to enjoy a different light show…the atomic oxygen glow engulfingAtlantis 's payload bay. The low-orbit space through whichAtlantis plunged was not empty. We were in the outer reaches of the Earth's atmosphere, which contained billions of atoms of UV-altered molecular oxygen known as atomic oxygen. The wind they produced was vanishingly thin, but it was enough to react with the shuttle's windward surfaces to cause a Saint Elmo's–like fire. The glow was so intense it appeared we had flown into a hazy alien fog. Every affected surface was covered to a depth of several feet. If we had not been warned of the phenomenon, I would have worried we had passed into the Twilight Zone and our spaceship had been transformed into a ghost ship. We had been damned by the curse of the skull man.

Atlantiscurved over northern Europe toward another forty-five minute day. If ever there was a music composition perfect for watching the beauty of an orbit sunrise, that composition would be Pachelbel's Canon. As the violin melody played on my Walkman, the rising sun painted the horizon in twenty shades of indigo, blue, orange, and red. God, how I wanted to stop and just hover.

I took off my headset and watched the Earth in silence. I also wanted tohear spaceflight and seal that memory in my mind. The cabin fans stirred the air with their constant soft whoosh. From downstairs I could hear the muted clatter of the teleprinter printing out checklist changes and weather reports for tomorrow's reentry. Someone coughed. The UHF radio captured the gibberish of a foreign pilot talking to his controller somewhere below.

I inhaled the smell ofAtlantis. There was no evidence of the humanity that inhabited

her, no odor of our bodies, our food, our waste, our emesis. The engineers had done a remarkable job of filtering the air. The only “smell” was that of unnatural sterility. I missed the scents of rain, desert, and sea…and I had only been away from the Earth for four days. I wondered if engineers would ever be able to package smells of our home planet so that Martian pioneers could remember their roots. For their sakes, I hoped so.

I took a moment to look aroundAtlantis ’s cockpit and capture that memory, knowing that when I crawled from her side hatch tomorrow it would be for the last time. The windows and floor were the only surfaces not covered with switches, controls, circuit breakers, computer monitors, or TV screens. Cue cards dotted the panels. Bound checklists were similarly scattered on Velcro pads. Twelve years ago, I had been overwhelmed with the machine’s complexity. Now, the cockpit was as familiar and comforting as my living room.

I turned and looked forward. The PLT’s seat belt hovered like a charmed snake. The three computer screens were off. No reason to waste power during a sleep period. My eyes touched on the life-and-death switches I had so often feared might play a part on one of my missions: the abort selection switch, the SSME shutdown buttons, the BFS engage buttons. I would never need any of them and I thanked God for it.

I floated back to the forward windows. The orbits continued…25,000 miles, 90 minutes, one sunrise, one sunset, a brush with the Arctic Circle, a brush with the Antarctic Circle. At each equatorial crossingAtlantis passed 1,500 miles west of its prior transit, an effect of the Earth’s eastward spin underneath our orbit. In circuit after circuit, I was seeing a different sea, a different land, a different sky. I watched North African deserts stretch to the horizon in dunes as perfectly spaced as ripples in a pond. I passed over snowy Siberian forests as virgin as the Garden of Eden. I saw the green vein of the Nile and the white-tipped chaos of the Himalayas and the Andes. I saw perfect fans of alluvial debris debouching onto desert floors, each a signature of millions of years of mountain erosion. I thrilled to shooting stars and the stellar mist of space and twinkling satellites and the jewel that was Jupiter. I saw the Baikonur Cosmodrome,Sputnik I ’s launch site, with the nearby Aral Sea appearing oil black against the winter white of the Kazakh Steppes. A few turns later the desert-lonely lights of Albuquerque came into view and I marveled at how those two places, so geographically distant from each other, had been inexorably linked in my life. I passed over every unimproved road my parents had ever dared, every mountain I had ever climbed, every sky I had ever flown. With the music of Vangelis and Bach and Albinoni as a sound track, I watched the movie of my life.