

Prologue

If I have one complaint about the center of the Milky Way, it is that I found it nearly impossible to get a decent night's sleep. The sky teemed with blue-white stars, each as brilliant as a full moon. There must have been thousands of them, and I, sensitive to light as I am, felt pinned from all sides by their radiance. It made no difference that the portals of my craft could easily be covered to block out the glare; the knowledge that I was bathed in the light of this enormous star cluster was enough to keep me awake. Had I been able to sleep, I might have managed to convince myself that this long voyage was an entertaining dream, my answer to Johannes Kepler's *Somnium*. That great astronomer's allegorical excursion to the Moon, circa 1611, had been a favorite of mine as a student—I once translated it from the Latin myself—and since then I have often wondered what subliminal role it played in triggering my wanderlust. But this was no dream. The sensations were too acute and the discomfort too real to be so easily dismissed as imaginary.

It's funny how I dwell on the memories of such small annoyances nearly as often as I mull over the great themes that have emerged during my travels. In my mind I will always be able to revisit the searing, metallic glare that confronted me near the Crab Nebula's pulsar; the infuriating, impenetrable shroud of dust that blocked my explorations of the giant star Betelgeuse; the seasickness that overtook me as I surfed through heavy turbulence to the nucleus of the galaxy from which I now write. The grander episodes have been internalized, I suppose, and no longer serve to mark the specific events of this journey so much

as to characterize my own progress as its witness. Among these episodes were the life-and-death encounters: a terrifying incident near the second black hole I visited, my escape from a supernova explosion in the Magellanic Clouds, the barrage of rogue boulders that nearly destroyed my craft as I tried to watch the creation of a planet. These dramas, any of which could have cost me dearly, I seem to have taken in stride. Each has helped to crystallize an aspect of this journey—to broaden my appreciation of relationships among phenomena that I scarcely imagined could be connected in so many ways.

Funny, too, that a few periods of enforced wakefulness should have disturbed me. After all, 85 percent of my journey has been spent in hibernation—a necessity, given the journey’s length. I have been traveling, now, for more than 200 years by my clock. I am—or was—an astrophysicist of the early twenty-first century. I think back on that time frequently, and it is only with the greatest difficulty that I can accept the fact that (almost certainly) every last one of my colleagues has been dead for 60 million years! This trip has occupied less than half of my conscious lifetime, and part of my psyche cannot grasp the passage of so much time on Earth.

Yet there is nothing paradoxical about the distortions of time that I have had to create in order to make this trip. Because my craft has accelerated to within a hair’s breadth of the speed of light (without ever exceeding it), small amounts of time pass for me while eons elapse for Earth and most other bodies in the cosmos. I am a manipulator of time, though I am doing nothing that is not readily comprehensible to every physics student on my planet.

Nor are the other technical aspects of my craft anything more than extensions of the technology that existed at the time of my departure. True, I pioneered the experiments that led to this highly efficient form of propulsion, and I was the first to build a prototype. But by the spaceship design standards of my time, my craft boasts few extravagances. No one would have called this a cathedral to space travel; it is certainly no space-metropolis.

Prologue

11

Why should it be, given that I am its only inhabitant? My craft is cozy but not cramped. I have grown into it. I have lived here so long that I have come to think of it as an extension of myself, just as a hermit crab must come to regard its adopted shell. I'm organized but not especially tidy; fragments of my writings and calculations are strewn about. And I have set several view screens to project images that please me—reminders both of Earth and of places I have encountered on my odyssey. In a word, my craft is home.

This vessel has flawlessly provided the necessities of life for all my waking years aboard. Food and air have never posed a problem. I have modest stores, I recycle waste, and whatever else I need I synthesize from the material of space. The fuel scoops, which can be extended out to thousands of kilometers from my living quarters, sweep through a kilogram of interstellar matter per second of Earth time (far more per second of time as measured by my clocks). Most of this matter is hydrogen or helium, and it is instantly converted into energy for propulsion. A small fraction—about 1 percent—consists of oxygen, carbon, and all the other elements. Of this, only a tiny amount needs to be diverted for conversion into food or air or for the fabrication of any other materials I require (such as tools, paper, and patches for my craft's skin).

My craft is sturdy, too—I have survived, after all, and am in reasonable health—though it is perhaps not quite so sturdy as I should have liked. I have subjected it to conditions it was never meant to endure and have watched, horrified, as its outer layers began to boil and slough off under the intense pressures of an onrushing nebula. But the shielding has always held. Because it has protected me time after time, I have begun to develop the kind of affinity for it that comes with shared adversity—as though it were a traveling companion.

Does my craft have a name? I had never thought to name it—such a symbol of personification seemed unnecessary. But how about *Rocinante*? The name has some sentimental value for me. One of my graduate students gave this label to my research

group's first computer. I immediately recalled John Steinbeck's motorhome in "Travels with Charley," but it turned out that she had named it after the spaceship in a rock group's popular song. My faculty colleagues assumed we had named it after Don Quixote's horse and proceeded to call the department's successive computers Dulcinea, Panza, and so on. Personally, I have always leaned toward the Steinbeck association, and I think it also suits my craft. *Rocinante* is homey in a rough sort of way, like a camper van. An old camper van, for that matter, with its fraying upholstery. In lieu of human companionship (always pragmatic, I have long since trained myself to cease regretting its absence), my craft at least provides the companionship of a stable, human-scaled environment that I have shaped. It is necessary armor against a cosmos that does not know I exist.

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I see no reason to rehearse in too great detail the events that led up to this trip and have now receded so far into the past. I was motivated by several considerations. First, I traveled because I could. The craft was ready, and I grew impatient waiting for the formal cycle of testing and refinement that would have extended (I feared) far beyond my lifetime. Then there were academic and political disputes—over my experiments and my theories, over priorities and precedents—that now seem so petty and incomprehensible that they do not bear repeating.

The scientific and philosophical motivations remain much more vivid, although even they have evolved so far beyond recognition that it scarcely seems worthwhile to describe them exhaustively. A number of bizarre objects and phenomena had been the focus of my studies for several years. There were quasars, pulsars, jets, and black holes, to name a few of the more exotic ones. Were they all merely curiosities, or did their similarities, differences, and relationships convey some more subtle message about the way things are constructed and the way everything "works" out there? In what ways did they con-

nect—if at all—with the “everyday” phenomena of the skies: the stars, galaxies, and nebulae with which I had long been familiar?

My scholarly interests in these phenomena, and the questions they raised, gradually took on the character of an obsession. Then, the invention of a means to travel in the realm of these bodies made the prospect of some sort of trip irresistible. To gather firsthand evidence about them—that became the objective against which I would have to judge the success of my work, eclipsing the accolades that began to rain down on me as word of my propulsion experiments leaked out.

I was enthralled with the idea of touching the places I studied, or coming as near to touching them as I could. For years I had endured the gloating of my colleagues in the field of planetary science. They had grown accustomed to visiting their objects of study—at least the local ones—and literally scooping up samples, if not in person, then through the agency of automated probes. We astrophysicists had always had to make do with remote viewing and indirect deductions based on highly idealized models for the phenomena we studied. A slight mistake in the observations, and we were easily fooled, as we were when we mistakenly attributed the pulsations of a nearby binary star to a quasar nearly coincident with it on the sky. To make any progress at all, we applied a “principle of mediocrity,” asserting that any type of phenomenon found nearby should be characteristic of the Universe at large. This principle often went under the more dignified name of the Copernican Principle (after the Polish astronomer who had the audacity to lump Earth in with the other planets, removing it from its Ptolemaic position at the center of the universe). To extend the Copernican Principle to physical laws was to assume that those laws applied equally everywhere in the Universe. A very healthy conservatism, I suppose, that usually stood us in good stead, but a philosophy that made it much more difficult for an astrophysicist to discover a new law of nature.

Even worse off were the poor cosmologists, who had only one “object” to study. At least we could compare different galaxies

and nebulae, much as the planetary folk practiced “comparative planetology.” I often suspected that a kind of cosmic loneliness was the real reason why cosmologists were so apt to hypothesize parallel universes, “many worlds” theories, and the like. These alternative universes, patently undetectable, were like their imaginary friends.

The idea of bringing to these studies even the slightest bit of immediacy, of direct sensation, became my crusade. Finally I hatched a concrete plan: to travel to the center of the Milky Way, to see what was there, and then to return. Why visit the Galaxy’s center? As best I can reconstruct it, I had fallen prey to a simplistic optimism about the root of all structures—a kind of cosmic Utopianism. I came to believe that the secret to the organization of the Universe could be summed up in a single word: gravity. Experience as pure a gravitational field as possible, and you will have had all the experience you need, I thought. At the time this seemed to make sense. Gravity was always attractive, unlike the forces that governed electricity and held sway inside atoms. And unlike these other kinds of forces, gravity did not falter (although it grew steadily weaker), no matter how large the distances involved. It held the Moon in orbit around the Earth, the Earth around the Sun, and the Sun around the Galaxy. The analogy went all the way up to the entire Universe, which actually could have recollapsed as a result of its own gravity, if only it had been sufficiently massive and had not flung itself apart so violently at the outset. Universal attraction seemed to be the key. Perhaps this is why, in a perverse and symbolic way, I welcomed the unpleasant sensation of being pinned inside the cockpit of my craft by the oppressive glare of the Galaxy’s central star cluster. The stark shafts of light, beating in on me from all sides, immobilized me, as though I had fallen under the influence of some immense gravitational field. In a sense, this was what I had been looking for, although I had expected to find it manifested in a physical rather than a psychological force.

Is there a better place to experience pure gravity than in the vicinity of a black hole? After all, a black hole is often described

Prologue

15

as the disembodied gravitational field left behind when matter is sucked out of this universe and goes . . . who knows where? I knew that there was a good-sized black hole smack in the middle of the Milky Way. The evidence was incontrovertible. My colleagues—two groups of them, working independently in Germany and California—had plotted the motions of stars and found that their orbits were behaving as though they were under the gravitational influence of matter equivalent to $2\frac{1}{2}$ million Suns. My jaw dropped when they showed me their “movie” of stars careening around in tightly prescribed orbits, half a Galaxy away. It had taken them decades to compile the frames, each one a year’s worth of work. They looked in vain for a tight cluster of stars to provide the inferred attraction, but all they came up with was a faint speck glowing a bit with X-rays, radio waves, and gamma rays. If this wasn’t a black hole, they concluded, it was something even weirder.

The Milky Way’s center lay 26,000 light-years from Earth, but the trip, I calculated, would take just 20 years in each direction, by my clock. Because I would spend most of that time in hibernation, it did not seem that this journey would constitute such a large investment as measured against my life’s duration. As measured against its texture, though, I knew the impact would be incalculable. I would return more than 50,000 years of Earth time in the future—sheer madness, from the point of view of resuming any sort of normal existence—yet my compulsion to travel was such that this does not seem to have worried me.

As it turned out, I did reach the center of the Milky Way, but then my plans went awry. Disappointed and confused by what I found there, I traveled onward, in search of some kind of closure to my mission, then onward again. Each leg of the journey drew me inexorably to the next and changed the character of my quest. A list of destinations and half a lifetime away from home: those are the facts of my journey. But such a list does not express the deeper structure that slowly asserted itself. That will take many more pages to describe.