

Infinite Presumption

Something in us wants to get back every memory, every thing we have lost, every thing that was put together ever and once to make us. It is a sickness, but it is a wonder and a gift too. And though nothing in this century has worked out, we still expect to survive intact and to deliver the torch to those who will revive us in some other place in some other way. That is the garden of childhood we come from and return to beyond the stars, and beyond the figments and mirages of space and time.

Richard Grossinger, *The Night Sky*

I

Konstantin Tsiolkovsky, the founding father of the Russian space program, Robert H. Goddard, the American rocket pioneer, and Hermann J. Oberth, the early German theorist of space travel, all were greatly influenced in their youth—as they proudly admitted— by the science fictions of Jules Verne. The French novelist's fantastic tales engendered in all three of these early visionaries the dream— fundamental to the early Space Age—of literally traveling from here to the moon. The memes of Jules Verne, we might say, were very infectious.

The dreams of today's science fiction writers are, of course, far more complex, fantastic, cosmic, and ambitious—far more new wave—than Verne's simple, nineteenth-century faith could have imagined, and the memes that these dreams spin off are more radical. So too, as we might expect, are our attendant Space Age prophecies; we envision much more than flying to the moon: to hear us talk, we are hatching extravagant schemes not only of exploration and colonization but of supremacy. Whether or not any actual influence—any implanting of memes—can be shown of the former on the latter, the respective probes of science fiction and science fact remain in synchronous orbit, both inspired by what J. G. Ballard has described as the need to ceaselessly invent the "infinite alternatives to reality which nature itself has proved incapable of inventing" ("Cataclysms" 130).

After reading widely in both the nonfiction of Spacekind and almost as widely in contemporary science fiction, I think I may have discovered the seminal texts—the

memetic origins—of current extraterrestrial pioneering: Ian Watson's "Letter from God" and James Blish's "Surface Tension."

II

In the tour de force "A Letter from God," Watson tries to imagine, from an omniscient point of view and in a first-person narrative, the divine being's understanding of the evolution of the cosmos, including the emergence of humankind. Awakened from a sleep that has lasted for billions of years, God feels himself "incarnated" by a glimmer of consciousness (quiet as "the footfall of an intruder in a darkened bedroom") coming from a distant point in space—from Earth, from the human race.¹ Finally locating the source of the disturbance, God is initially disappointed, distressed by the "singleness of being" to which he is reduced by the limited consciousness of the human, the only true center of awareness in the present emanation of the cosmos.

"There oughtn't to be a single simple 'I,'" God laments, for his newfound egoistic state seems to him a fall from the "High Selflessness" that he considers more godly. "I shouldn't have heeded the first tug," God's hindsight tells him. "I should have turned over in my sleep, and slept through this cosmos till it collapsed! But in the vast silence that single note of life had sounded like a gong."

From the outset, however, God feels a mixture of love and hate for *Homo sapiens*. "Like a vagabond who has precisely one match to light one piece of kindling to keep warm by," God admits, "I directed myself toward you to cup my hands around that single prick of life-light, and nurse it with my breath." Omnisciently aware of all our many brushes with extinction (the Ice Age, global warming, overpopulation, nuclear holocaust), appalled at our seeming death instinct, and yet profoundly, ironically aware that his own consciousness is, in this manifestation of the cosmos, completely dependent on this paradoxical being, God is alternately sympathetic with and critical of our reign on Earth. Reminding humankind, with angry impatience, that he does not possess "the micromanipulative ability to pluck the ten thousand matches from [our] childish hands," God sometimes seems to look forward to our demise.² "My time should be eons, my span whole galaxies!" he pontificates with Olympian detachment. "This attention to you is straining my Godly eyes!"

¹ Actually the "tug of incarnation" that captures God's attention comes from two sources: the second, however—"something watery and oceanic"—does not endure but is "turned into perfume and boot-oil, manure and pet food" by men.

² Our undoing, God knows, need not be the result of nuclear war or ecological collapse. Its causes might be

Yet his admiration for *Homo sapiens*, the evolutionary accident, and its incredible "run of luck" is unmistakable. In his heart of hearts, God almost seems often to wish for humankind to endure and prosper, and after all, there is something in it for him. Noticing our first futile attempts to expand outward into the universe early in the Space Age ("You've flown to your moon, though, in tin cans, you've sent tin cans farther out into the first few inches of that aimless deadness that stretches out all around you everywhere"), God begins to hope that our dispersion into space—as humankind inhabits various cosmic niches and breaks into numerous sub species—may result in the creation of "all the myriads of life-forms that are so sadly lacking," thus freeing him from his confining ego.

With this hope in mind, God concludes that he must intervene in our affairs; breaking with tradition, he decides to "level" with humankind. His plan for enacting this goal includes implanting ten-mile-high pillars in Russia and the United States, on which he has inscribed a "Letter from God" setting the story straight about cosmic and human evolution. For various reasons this plan fails, indeed backfires, precipitating a catastrophic nuclear war—which proves to be a great embarrassment to God, who, having an ego, is easily humiliated. Feeling incompetent, he abandons his involvement in earthly affairs, withdrawing "to lick [his] wounds for a century or two."

While he isn't watching, however, humanity returns from the nuclear ashes to develop faster-than-light starships and begin to colonize other worlds (including the terraforming of seemingly uninhabitable planets). Switching to "high-speed scanning" (for, as medieval theologians taught, all time is to God a *nunc stans*—a standing now), God watches all of our future in space unfold.

After millennia, he witnesses "starmen . . . constantly changing themselves into new and diverse kinds of beings: beings who can inhabit dead worlds without air or water, beings who can swim in gas giants, and coast through raw vacuum. Changing. A hundred forms, a thousand forms." "Like fleas," humans "leap from the woolly spiral of the Milky Way across into Andromeda."

Such diversification had once been God's fondest wish; through it, he hoped to free himself from a restrictive single self. But now that it has actually come about, he finds himself gravely threatened by the result. He senses that we have now become his "Adversary": "You contribute nothing to my own expansion. None of you.

ontological: "And you're going to destroy yourselves," God muses. "Would it destroy you equally to know that there's nothing else alive out there?"

I'm as restricted as I ever was. I can't grow to anything like my full capacity. But you aren't restricted." God, it seems, has become envious of human beings.

And then he begins to grasp humanity's true objective in space. This species whose spark of life was once so weak that only his special attention could cause it to burst into flame aspires to challenge God himself. "You're hatching a multibillion-year scheme," God deduces, "to survive the collapse of this cosmos and make it through into the next, differently cued cycle of existence. . . . Worse, to cue the next cycle yourselves so that it starts out right." Paranoid, perhaps justifiably, he even suspects that we hope to bring him to trial for his crimes!

Hiding "in the deepest deeps between the metagalaxies", God finds a last glimmer of hope in the indisputable fact that he and humankind will eventually meet when the universe begins to contract again:

I know that wherever I hide we'll all be rushed together in the end. Then you'll catch me, sure as eggs is eggs.

Cosmic eggs are no exception. Particularly when they're all in one basket.

Our species' cosmic ambitions, both God and his scribe would seem to agree, is a "wonder and a gift" as well as "a sickness."

And judging by the speculations and prophecies and visions of contemporary Space Boosters, as we shall see, God's understanding of human destiny and motives would seem to be almost omnisciently accurate.

In James Blish's "Surface Tension," a "seed ship" from Earth crash lands on the distant planet "Hydrot"—a world, as its name implies, almost entirely covered with water. The ship's mission, we learn, is to sow human life throughout the galaxy by means of a device called a Panatrope, which permits modification of the human genotype to allow for the fullest possible adaptation of humans to the various environments in which they are to be sown. But Hydrot, it seems, had not been a designated target planet for such insemination, its environment being unsuitable as a habitat even for altered humans. The seed ship's unexpected arrival on Hydrot, one philosophical member of the crew speculates, thus seems like a kind of punishment for humanity's hubris in believing that we could and should seed the galaxy with our kind.

Although they soon recognize that they are themselves doomed, the crew vows to attempt to populate Hydrot with humans in germ, even if their efforts are doomed to failure. But with their cargo of human "germ plasm" destroyed in the crash, they must use themselves as the bank from which they will borrow the stuff of the human for this alien world. Like gods, they ponder what attributes they will give to these protohumans they will leave behind—the reincarnation, in effect, of themselves.

They decide that the future colonists will be placed in fresh water, in a mere mud puddle, where they will not have to compete with the predator jellyfish native to Hydrot. They give the colonists webbed extremities, but also thumbs and big toes. They bequeath them lungs that can be easily adapted to nonaquatic breathing. And they make them microscopic, but neither the smallest nor the largest creatures in their world, reasoning, with impeccable Darwinian logic, that competition for dominance of their environment will promote the evolutionary selection of their latent skills and intelligence in a way that sheer physical dominance never could.) They give them as well both an ancestral memory—so that they will faintly recall having been left in an alien world—and metal plates on which the true origin of their microscopic kind is recorded, though as the crew recognizes, they may never be able to comprehend the enigmatic history revealed there.

Before the crew can perform a final transference into their minuscule heirs—before, as Blish observes, Hydrot becomes the crew's Lethe—they must decide a last great, essentially theological question: should these aspiring humans be allowed to know they are microscopic? Otherwise how could they ever realize amidst the relativities of space and time that their universe is a mere puddle of water? They decide against imparting such knowledge—for would it not burden them with useless and intimidating, even para-lyzing religious fear and awe?

Blish's story resumes sixteen generations later in a puddle of water on Hydrot and describes how Lavon, a young "man" about to assume the role of Shar, or sage, among the human colony becomes obsessed with the desire to seek out his and his kind's origins, which he knows from the metal plates left by their creators lies in a world beyond the watery one in which men have come to thrive. The "wisdom of the Creators," microengraved on the sacred plates, speaks of "space" and "spaceships" and fourteen times mentions the mysterious word "star," but such mysteries do not interest Lavon initially, and he rejects his role as Shar, preferring to live, like most of contemporaries, only for the moment.

But later he is strangely possessed by a desire to explore what lies beyond the sky above (that is, the surface of the puddle), to discover the source of the mysterious light that shines through it. Para, one of the protozoans who have formed a partnership with humankind in this watery world, explains to Lavon that his own kind's ancient wisdom teaches "that in this universe there is logically no place for man."

Our memory is the common property to all our races. It reaches back to a time when there were no such creatures as men here. It remembers also that once upon a day there were men here, suddenly, and in some numbers. Their spores littered the bottom; we found the spores only a short time after our season's Awakening, and in them we saw the forms of men slumbering.

Then men shattered their spores and emerged. They were intelligent, active. And they were gifted with a trait, a character, possessed by no other creature in this world. . . . Men had initiative. We have the word now, which you gave us, and we apply it, but we still do not know what the thing is that it labels.

Such an understanding Lavon feels within. It fuels his longing for higher knowledge.

He dares to violate his people's consensus opinion that the sky is as impenetrable as the bottom itself and embarks on a journey to this world's upper limits. In possession of the "right stuff," he undertakes a heroic adventure to puncture for the first time the "surface tension" of the liquid sky and glimpse the world of space that lies beyond; though he nearly dies in the process from drowning and sunburn, he returns with a vision of escape for himself and his people to become a kind of Tsiolkovsky, Goddard, and Chuck Yeager all rolled into one.

But this great migration must be undertaken without the aid of the metal plates. Anxious to circumvent if possible humankind's longing to depart, the Protos had thrown away the plates when Lavon showed no interest in their message. Even without them, however, humans—inspired by Lavon's passion for knowledge ("He could no longer tell what he knew from what he wanted to know")—build a vehicle in which to make their journey. No obstacle can obstruct them, and although they come to understand that hardly a "single normal, understandable concept could be applied to the problem of space travel," and despite complaints of wastefulness from some

of society's youth ("Everybody these days knows that there's no other world than this one," they protest), the vehicle is completed.

The journey commences and humans embark for the sky, joined by Para, who accompanies its fellow species out of curiosity even though he cannot comprehend their motives. As they are about to leave their "native universe" to enter the space that lies beyond the puddle, Lavon begins to feel a strange kind of nostalgia for what he has left behind. "The world looked different, now that he was leaving it. How had he missed all this beauty before?"

"Fear of the outside" mounts within as their vehicle, temporarily stalled by the surface tension, pauses "upon the threshold of infinity." Like escapees from Plato's cave of illusion, they are blinded at first by their encounter with the unmediated sun and the light of knowledge of a cosmos wider than they had ever dreamed.

Intrepidly, they begin to formulate a new cosmology to explain the universe as they now conceive of it.

I'm beginning to get a picture of the way the universe is made, I think. Evidently our world is a sort of cup in the bottom of this huge one. This one has a sky of its own; perhaps it, too, is only a cup in the bottom of a still huger world, and so on and on without end. It's a hard concept to grasp, I'll admit. Maybe it would be more sensible to assume that all the worlds are cups in this one common surface, and that the great light shines on them all impartially.

Undeterred by this Copernican revolution in their worldview, they ignore the pleading of a simple mechanic on board the ship to turn back because they do not belong in such a realm. And though the immensity of space seems beyond all fathoming, they bravely face the new universe they must now scale if they are ever to accomplish, as their creators had done and hoped they, too, would do, the crossing of space, buoyed by Para's dying tribute to human initiative: "What man can dream, Man can do. . . . There is nothing that knowledge cannot do. With it, men . . . have crossed . . . have crossed space."

In science fiction, Ursula K. LeGuin has divulged, the future is always a metaphor (149). Now if such stories as these have indeed become, as both tenor and vehicle, at once the blueprint and operations manual for mankind's future in space, if their memes have, as I have suggested, affected those who now envision our destiny just as Verne influenced the first generation, we would logically expect to find them thinking along lines similar to the following.

We might find those minds contemplating the philosophical anthropology of the extraterrestrial imperative convinced that mankind's emergence into the cosmos, our breaking of the surface tension of the sky, must be understood as an evolutionary stage, a natural development, not just comparable to but homologous with the emergence of life on Earth from the water, or the separation of a child from its mother.³ We should not be surprised to hear of the following:

A rocket pioneer (Wernher von Braun—Oberth's greatest disciple) suggest in the 1960s that putting a man on the moon "is equal in importance to that moment in evolution when aquatic life came crawling up on to the land" (quoted in Mailer 69).

We might hear a renowned space scientist (Krafft Ehrlicke, in "The Anthropology of Space Flight") speculate that the discovery of the "extraterrestrium" can actually be traced back to the arrival of life on land; that mankind is a true "amphibian," capable, because of the adaptive capacity of mind, to evolve beyond the merely biological (265).⁴

We might hear a science fiction writer (Arthur C. Clarke, in "Space Flight and the Spirit of Man") conclude that the Space Age represents the intended culmination of evolution: "it is often hard to avoid the feeling," Clarke writes, "we are in the grip of some mysterious force or *Zeitgeist* that is driving us out to the planets, whether we wish to go or not" (7).⁵

We might find the film critic W. R. Robinson, contemplating the famous scene in *2001: A Space Odyssey* in which a hominid ancestor's bone/weapon becomes, in a match cut, a spaceship, suggest that we find the edit especially resonant because

³ The original meme is, of course, Tsiolkovsky's: "Earth is the cradle of humanity, but we cannot live in the cradle forever" (quoted in Hartmann, Miller, and Lee 7).

⁴ "Then life found itself stymied on the borders of space," Ehrlicke writes. "There are no biological means where direct application would permit living beings to enter and cross space. It is intriguing to think that life may have answered this challenge by producing a new amphibian—man—whose restless mind reaches beyond the confinements of his biological world. The human brain alone is capable of utilizing certain superior qualities of inorganic matter for entering space" ("Anthropology" 265).

⁵ "Life," Clarke explains, "adapted itself to the land by unconscious biological means, whereas the adaptation to space is conscious and deliberate, made not through biological but through engineering techniques of infinitely greater flexibility and power. At least we think it is conscious and deliberate" (*Coming* 7).

bones—indeed skeletons—were the first technology, containing in germ all the others—including space technology—to follow (Robinson and McDermott 36-37).

We might hear inventor, engineer, architect, and technological prophet R. Buckminster Fuller maintain that "to all who are living in cosmic realism, the immediate inauguration of additional Earth-Moon, around-the-Sun flying formations of our team could not be more humanly normal." For space exploration is every bit as natural "as a child coming out of its mother's womb, gradually learning to stand, then running around on its own legs." The originator of the concept of "Spaceship Earth," Fuller insists that since "the universe is nothing but technology," it follows that Space Age technology "is something that's always been going on." For "we are in space and have never been anywhere else. . . . We are already a space colony" ("Universe" 33).

We might hear a journalist (Oriana Fallaci, in *If the Sun Dies*) describe Earth as a "comfortable" womb and then add "But you can't stay in your mother's womb forever. If you stay there forever, you die, and she dies too" (18).

We might learn that a visionary physicist (Freeman Dyson)—who has himself designed an interstellar spacecraft—believes that "Man's gray technology is also a part of nature . . . nature's trick . . . used by her for her own purposes": "to enable life to escape from Earth . . . to adapt rapidly and purposely . . . spread and diversify and run loose in the universe" (*Disturbing* 235).⁶

We might hear J. D. Bernal explain his theory of the creation of a new, extraterrestrial species, pioneered by the visionary few (the Lavons among us), by citing an evolutionary precedent. "More fish remain in the sea than ever came out of it," Bernal reminds (71-72).⁷

We might hear an historian (Louis J. Halle, in *Out of Chaos*) declare his faith that "there is no other prospect as promising [as space exploration]" for what he conceives as "the mind's mission": "bringing order out of chaos by the progressive enlargement of the world it comprehends." "Once in outer space," Halle insists, "we will have enlarged our horizons as would the dwarf flea if it were to expand its vision

⁶ Though "grey" technology, as Dyson insists, "was, and will remain, essential for making the jump from Earth to space," it was not the first step in that direction. The "green technology of genetic manipulation" came first and was governed by the same *telos*: it should in fact be seen, Dyson suggests, as "another trick of nature, invented to enable life to adapt rapidly and purposely rather than slowly and randomly to her new home" (*Disturbing* 235).

⁷ "It is not the habit of evolutionary processes," Bernal writes, "to transform the whole of one state of living into another. Rather does nature pick some particularly happy development and allow it to expand in the place of and even at the expense of her earlier efforts. If man is to develop into something new, the insistent question is, whether all humanity is going to develop or only a part of it" (71-72). Bernal leaves no doubt as to the proper answer.

from the limits of the single cell to encompass first the leaf, then the tree, then the forest, and then whatever lay beyond" (632).

We might hear a psychiatrist (Patricia Santy) suggest that psychological consideration of the problems of space exploration could most profitably focus, from an evolutionary perspective, on "the concept of separation/individuation from this planet, Mother Earth" (525).

We might also anticipate that the idea of seeding the universe with the human would be given serious consideration:

We might hear Francis Crick defend his theory of "directed panspermia" against detractors by pointing out that we ourselves could and probably will engineer a similar feat itself in the foreseeable future (147-51).

We might find Iain Nicolson (in *The Road to the Stars*) envisioning a future period of our history that he calls the "interstellar humanization era."

We might hear Timothy Leary maintain that bodies evolved in order to transport the "seeds" of life "throughout the galaxies in the form of nucleotide templates." These "seeds," according to Leary, "land on planets, are activated by solar radiation, and evolve nervous systems," adapting themselves expeditiously but only momentarily to "the atmospheric and gravitational characteristics of the host planet, the crumbling rock upon which we momentarily rest" (114).

We might find Clarke (in *Childhood's End*) imagining the very substance of the Earth itself to be only the contents of a seed intended to provide timely sustenance for a new kind of organism, planted (and harvested) by higher beings, ripened through human evolution, and bound for reunion with the cosmos.

We might hear a molecular biologist (Sol Spiegelman) suggest that "DNA invented man to explore the possibility of extraterrestrial life, as another place to replicate" (quoted in Calder 25).

We might hear Dyson proclaim with Lysenko-like faith that the universe will ultimately welcome our cosmic propagation, for destiny is on our side: "The interstellar distances cannot be a permanent barrier to life's expansion. Once life has learned to encapsulate itself against the cold and the vacuum of space, it can survive interstellar voyages and seed itself, wherever starlight and water and essential nutrients are to be found. . . ." Though he recognizes that "there will be problems for life to solve in adapting itself to planets of various sizes or to interstellar dust clouds," none will prove insoluble: nothing "will . . . be able . . . to stop the expansion of life once it is well started. The power to control the expansion will be

for a short time in our hands, but ultimately life will find its own ways with or without our help" (*Disturbing* 236).

We might learn that Frederick Turner, a poet and critic, envisions the "gardening of Mars"—its cultivation as a viable environment via bioengineering, nanotechnology, and terraforming—as a world-historical project. As a replacement for both the great religions and the great wars, the fertilizing and seeding of the red planet will "allow us to pursue beauty and truth on a grand scale," resulting not only in the spread of Earth's ecological diversity to another world but, most importantly, in the "spiritual metamorphosis of the alchemist, of us" ("Life on Mars" 34, 37).

We might find two advocates of the "anthropic cosmological principle," astronomer John D. Barrow and physicist Frank J. Tipler, demonstrating, with supreme mathematical logic, that colonization of the galaxy by means of increasingly sophisticated probes—each capable of constructing, based on new scientific knowledge and technological sophistication, more and more advanced means for wider and more successful dispersal of the human into cosmic niches—is not only economically feasible but a virtual statistical certainty (578-86).

We would not be surprised to find those like Lavon (and Bradbury's Sim) suffering from the claustrophobic limitations of their world and driven by an inexplicable initiative and an almost forgotten memory of a higher calling to pursue a cosmic destiny, declaring their ultimate independence from a planet they have never accepted as home:

We might hear Ehricke advocate escape from the Earth as our species' only hope for survival: "If we insist on operating as one world Neanderthals instead of growing into true polyglobal cosmopolitans, then nothing will save us. We certify our kind as evolutionary failures." The time has thus come, Ehricke exhorts, to expand our "one room apartment into a mansion" ("Extraterrestrial Imperative" 25).

We might hear space colonies expert Gerald K. O'Neill admonish his species (in *The High Frontier*) that now is the time for the species to overcome the silly "planetary hang-ups" and "planetary chauvinism" that keeps it shackled to the Earth and to begin to harvest the riches of space (34-35).⁸

⁸ "We are so used to living on a planetary surface," O'Neill insists, "that it is a wrench for us even to consider our normal human activities in another location. If, however, the human race has now reached technical capability to carry on some of its industrial activities in space, we should indulge in the mental exercise of 'comparative planetology.' We should ask, critically and with appeal to the numbers, whether the best site for a growing advancing industrial society is Earth, the Moon, Mars, some other planet, or somewhere else entirely. Surprisingly, the answer is inescapable: the best site is 'somewhere else entirely.' In a roundtable TV interview, Isaac Asimov and I were asked why science fiction writers have, almost without exception, failed to point us toward that

We might hear a futurist (Adrian Berry, in *The Next Ten Thousand Years*) observe that "through some biological quirk that distinguishes us from other species, we have nearly always had practical and energetic minorities who make the scientific progress that carries forward the rest. Their work is often despised and ignored—until its benefits become apparent, and everyone steps forward to claim them. Nobody knows why human beings, alone among known species, should have the capacity for original thought. But that gift will take him to the stars" (123).

We might hear Clarke argue that the human mind will "stagnate" if "compelled to circle forever in its planetary goldfish bowl": "From time to time, alarm has been expressed at the danger of 'sensory deprivation' in space. . . . I would reverse the argument; our entire culture will suffer from sensory deprivation if it does not go out into space" (*Voices* 4).

We might hear a technology expert (G. Harry Stine, writing in *The Space Enterprise* [Chap. 11]) attempt to persuade us that "the slow realization that we were not trapped on the treadmill cage of our home planet" has freed us from all doomsday thinking; "emerging from the womb of Mother Earth" into the "open system," the "real utopia" of space, "we can become a universal species capable of expanding into . . . and using the universe."

We might expect to find some who, even without definite access to the revealed wisdom of the creators, have nevertheless come to think of humankind in the Space Age as potentially godlike, or at least god-sanctioned, however limited, however infinitesimal we appear.

We might find Stephen Hawking, a theoretical physicist ravaged by Lou Gehrig's disease, setting out to complete Einstein's "unified field theory" and become—despite great physical handicaps—the first individual to totally comprehend the universe. His physical incapacity, it has been suggested, may in fact be the real source of his genius: "His wheelchair gives him a special vantage point for the major preoccupation of [his] mind: the universe we inhabit, how it came into being, how it operates, and how it will end. A totally cerebral human, he demonstrates the power of the human intellect to fathom the universe when the restless mind is set free" (Boslough 13).

We might discover the neoteleological "anthropic cosmological principle" suggest that the very existence of human beings and the human mind is the most important key to understanding cosmic evolution. "It would be hard to imagine a

development. Asimov's reply was a phrase he has now become quite fond of using: 'Planetary Chauvinism'" (35).

faster evolutionary scenario than the one that brought us into being on this planet," a poet writes in a brief exposition of the principle. "There has only just been enough time, under the most favorable conditions, for us to have evolved" (Turner, "Field Guide" 55). As a result, the principle implies, it is highly plausible that we are the universe's only intelligent life and the first to become conscious of the existence of the universe.

We might hear Wernher von Braun console us that not just evolution but the will of God is with us in our quest: "Men must always travel farther and farther afield, they must always widen their horizons and their interests; that is the will of God. If God didn't want it to be so, He wouldn't have given us the ability and the possibility to make progress and to change" (Quoted in Fallaci 231).

We might hear F. M. Esfandiary (aka FM-2030) openly promote divine aspiration for humankind: "contemporary philosophers state that we humans are striving to be god. Others more critical admonish us for arrogantly 'playing god.' They warn of dire consequences." But such criticism is absurd, Esfandiary insists. "We humans do not want to play god or to be god. We aspire to much more" (143).

We might hear the cofounder and president of the "Committee for the Future" (Barbara Marx Hubbard) recommend that humankind should learn to identify "much more with the Creator than with the created" (291).

We might hear A Russian historian (Zheva Sveltilova) insist that "when man conquers the universe, he will learn to believe in self. People who now believe in God will reject him. Such belief won't be logical or natural. Man will be stronger than God" (quoted in McDougall 455).

And we might hear the author of a book called *The Immortalist* (Alan Harrington) argue that, though human beings have always "conceal[ed] from ourselves the existence of our underground drive against the cosmic establishment ("Men must keep it from themselves that they are in revolt against the gods, or 'against nature,'" he writes. "Only by means of this hypocrisy, has our species been able to keep the revolutionary program going. It has enabled man to plot against his gods while he worshipped them"), the time has come to stop dissembling. "The time has come for man to get rid of the intimidating gods in his own head. It is time for him to grow out of his cosmic inferiority complex (no more "dust thou art, and to dust thou shalt return . . ."), bring his disguised desire into the open, and go after what he wants, the only state of being he will settle for, which is divinity" (24, 58).

Would we not also presume that some—like the Proto Para in Blish's tale—would be ready to proclaim, however prematurely, that men are the actual or potential conquerors of the universe?

We might hear Adrian Berry insist that

We cannot reiterate too strongly the dictum of the physiologist Constantine Generales that, although our physical strength is tiny, he can nevertheless learn to use and control forces quintillions of times stronger than himself. If there is some fundamental law that says we cannot, during the course of millions of years, occupy and exploit our entire galaxy of 100 billion suns, then that law is now hidden from us. (168)

We might hear a science fiction writer and editor of the magazine *Omni* (Ben Bova in *The High Road*) guarantee that "colonies and arks in space will transform the human into a truly spacefaring . . . immortal species, able to survive the death of its home planet or even the wreck of its entire Solar System." "Like gleaming pearls on an invisible linkage of radio waves," Bova's crystal ball reveals, "space colonies and arks will spread across the void, carrying the human race to its destiny among the stars" (233).

And we might hear a Hoover Institute fellow and a space scientist and author (Stefan T. Possony and Jerry Pournelle, in "Space Flight and the Longevity of Man") announce their faith that: "[there is] no reason why humanity cannot take part in the evolution of the cosmos." "Human direction of galactic events," they argue, "seems no further beyond our present capabilities than space flight would be to an amoeba—and we are closer in time to the amoeba than we are to our descendents 50 billion years from now" (87).

Some future scholar, working only from partial, textual evidence, might be tempted to suggest that Ian Watson and James Blish be counted as imaginative fathers of the Space Age thinking surveyed here. This contemporary scholar, however, knows of no actual influence. If fiction and nonfiction, imagination and reality, speculative probe and futuristic hypothesis now seem cut out of the same cloth, it is not because the von Brauns, Dysons, Ehrickes, and the likes have been reading "Surface Tension" or mail from god. These memes—whatever their particular form of communication and promulgation—are in the air now, inescapable elements

of the intellectual atmosphere of the Space Age. Science fiction writers, space scientists and visionaries, and conscientious objectors alike breathe them.

That the human mind is now coming to think this way customarily is nevertheless an extraordinary historical and philosophical development: one worthy of a moment's further reflection before we routinize it entirely.

IV

[Science] does not recreate a public world. Indeed it heightens the prevailing sense of unreality by giving men the power to achieve their wildest flights of fantasy. By holding out a vision of limitless technological possibilities—space travel, biological engineering, mass destruction—it removes the last obstacle to wishful thinking. It brings reality into conformity with our dreams, or rather with our nightmares.

Christopher Lasch, *The Minimal Self*

Like the tiny creatures of "Surface Tension," the human species was not directly told by its makers that it was microscopic, and although most of the world's cosmologies and religions contain in their wisdom such a realization, at least in germ (for instance, Jehovah's reprimand to Job—"Were you there when I laid the foundations of the world?"—implies human creatureliness and insignificance), it was not until the Copernican revolution that the real precariousness of our place in the cosmos began to have an existential impact on our self-conception and sense of destiny.

Contemplating the newly discovered seeming infinitude of the universe, Pascal, writing in the seventeenth century, found only cause for terror.

When I see the blind and wretched state of man, when I survey the whole universe in its dumbness and man left to himself with no light, as though lost in this corner of the universe, without knowing who put him there, what he has come to do, what will become of him, when he dies, incapable of knowing anything, I am moved to terror, like a man transported in his sleep to some terrifying desert island, who wakes up quite lost and with no means of escape. Then I marvel that so wretched a state does not drive people to despair. (88; my emphasis)

In the face of such a prospect, Pascal counseled humility: "Let man, returning to himself, consider what he is in comparison with what exists; let him regard himself as lost and from this little dungeon in which he finds himself lodged, I mean the universe, let him learn to take the Earth, its realms, its cities, its houses and himself at their proper value. What is man in the infinite?" (89). Pascal realized that the acceptance of an infinitely large cosmos ushered in a "new abyss" for humankind, so that we feel threatened from all sides. Though humans are infinitesimal in comparison to the universe, we are as well, Pascal reminded, a colossi compared to the infinitely small. We thus stand between "infinity and nothingness": "a nothing compared to the infinite, a whole compared to the nothing, a middle point between all and nothing, infinitely remote from an understanding of the extremes" (89-90).⁹ As a result of our place, Pascal warned, we must not inquire into nature "as if there were some proportion between [ourselves] and her," for even to pretend to do so requires a "presumption as infinite as their object" (90).

Pascal's response to the discovery of the infinite must have been in the minds of those genetic engineers from Earth as they redesigned the human for life on Hydrot. The prospect of the universe's immensity produced in Pascal the religious fear and awe they wanted to avoid in their microscopic heirs. However, we must remind ourselves that Pascal's reaction was not the only one inspired by the new Copernican cosmos. Giordano Bruno, for example, welcomed the infinite universe with true intellectual enthusiasm, as if humankind had at last discovered a suitable challenge to its power of intellect. The church, of course, found Bruno's thinking blasphemous, burning him at the stake in 1600. But Bruno's memes have obviously found fertile soil in a certain kind of Space Age mind.

Humanity's awareness that we are "a nothing compared to the infinite, a whole compared to the nothing" has—in a world-historical irony—produced results precisely opposite to those presumed by the inseminators of Hydrot. For the

⁹ Pascalian consciousness of the infinitely small, originally a by-product of the Copernican revolution, has now taken on a Space Age twist. Now we can browse through a coffee-table volume—Lennart Nilsson and Jon Lindberg's *Behold Man: A Photographic Journey of Discovery Inside the Body*—and be eyewitnesses as a sperm cell penetrates the membrane of an ovum, or watch a gall bladder in action, or, peering inside the eye itself, see ourselves seeing. Now, thanks to David Bodanis's *The Secret House: Twenty-four Hours in the Strange and Unexpected World in Which We Spend Our Nights and Days*, we can experience the opening of starch cells within a cooking potato, enter the tiny niches of a common pin to see the clusters of household bacteria living there, and watch a Velcro fastener close—from the Velcro's point of view. "Let a mite show him its minute body," Pascal writes (89), in preparation for his verbal revelation of the infinitesimal, and in the Space Age this mite returns, though the results are not humbling but horrifying. *The Secret House* offers us terrifying photographs—magnified one thousand times—of the dust mites that inhabit our carpets and furniture, feeding off the dead, flaking skin that perpetually falls from our bodies.

Copernican revolution, the transition from "the closed world to the infinite universe" (Alexander Koyre), has in fact encouraged some, no longer able to tell the difference between what they know and what they want to know, to redouble the human effort to comprehend the incomprehensible.

Contemplating the place of Darwin's conception of natural selection in the larger context of the entire "evolution of consciousness," Owen Barfield has wondered (in *Saving the Appearances: A Study in Idolatry*) what our understanding of evolution might have become if it had not been an outgrowth of, wedded to, reductionistic, positivistic, materialistic nineteenth-century thought. In a similar vein, we must remind ourselves that it is not the spiritual heavens of ancient astrology into which humankind would now embark, but a post-Copernican, deanimated, Cartesian cosmos, explained to us not by religion but by technologically enhanced, scientific cosmology. (*In the Flight from Woman* [105], Stern speaks revealingly of "the interstellar coldness" of the Cartesian system. The formulation is reversible. One might also speak of the Cartesian coldness of interstellar space since the Copernican revolution.) And it is not humankind in general that now contemplates heeding the extraterrestrial imperative. It is not the ancient Greeks, or medieval men and women, or Tang dynasty Chinese, or Native Americans, or Elizabethans who have penned these visions of the future but post-Copernican, Western minds.

As the result of the evidence acquired about the place of Earth in the cosmos by means of a human invention (the telescope), Copernican humanity concluded, once and for all, that the impression given to us by our senses of the nature of things was wrong. Cartesian doubt—a method of investigation designed to protect against the possibility that an "evil genius" is running the world in such a way as to always deceive our understanding—was born in response to the shame of the geocentric error, and the senses and the world the senses perceive have been suspect ever since.

The prime effect of the Copernican revolution was the newly acquired conviction that humankind should (in Arendt's words) "abandon the attempt to understand nature and generally to know about things not produced by man and . . . turn exclusively to things that owed their existence to man." Human reason, long deceived by its reliance on commonsense revelations about the world, thus came to seem "adequate only when confronted with man-made objects" (*The Human Condition* 280-84). *Homo faber* triumphed and remains the ruler still of human

capacity. The Copernican revolution was enacted on its behalf—to put it in power. Its values—its "distinctly modern suspicion toward man's truth receiving capacities, the mistrust of the given, and hence the new confidence in making and introspection . . . inspired by the hope that in human consciousness there [is] a realm where knowing and producing would coincide."—are now becoming the world's values, even in cultures that do not share its historical roots. It is *Homo faber* that would enact the extraterrestrial imperative.

With the coming of the Copernican revolution, *Homo faber* also reinvented itself as a discoverer, the potential explorer of the New Worlds of both the Earth and the infinite. And with this self-invention came "the liberation of man from his cosmic prison, from his ancient servitude and impotence—his liberation from an archaic way of understanding himself" (O'Gorman 87). But such a liberation, as we have seen, loosed the human "into a strange, ungovernable freedom" (Turner, *Beyond Geography* 255-56) and inspired the never-to-be-satisfied and perhaps innately destructive urge to journey beyond earthly limits. Such freedom sanctions the cosmic post-Copernican ambitions I have considered here.

It may well be true, as Kierkegaard, the great analyst of the dialectic of finite and infinite in the human spirit, documented in the middle of the last century, that at the heart of the modern "project" lies dread—the dread Pascal experienced in the face of the terrifying silence of infinite space—and that such dread now fuels humankind's energy. Riding the crest of such energy, we have surmounted our "fear of the outside" and, in a newly conceived leap of faith, actually broken through the "surface tension" of the planet. Now with infinite presumption, fearlessly willing to burn their bridges behind them, even to administer, as a parting gesture, a "scorched earth" policy to the Earth itself, some now dream of entirely abandoning a planet that, in a planned obsolescence, they are anxious to put behind them.¹⁰ We are witnessing, according to a radical critic of technology, the end of humility and the birth of a new, humanistic-with-a-vengeance cosmology. "It is not humility that inspires the new cosmological jargon," Jeremy Rifkin writes, "but bravado." In the Space Age, "We no longer feel ourselves to be guests in someone else's home and therefore obliged to make our behavior conform with a set of pre-existing cosmic rules. It is our creation now" (*Algeny* 244).

¹⁰ "Past a certain scale," Wendell Berry has noted in *Standing by Words*, echoing C. S. Lewis, "the person who makes a technological choice does not choose for himself alone, but for others; past a certain scale, he chooses for *all* others. Past a certain scale, if the break with the past is great enough, he chooses for the past, and if the effects are lasting enough he chooses for the future. He makes, then, a choice that can neither be chosen nor unchosen. Past a certain scale, there is no dissent from a technological choice" (60).

Humanity's whole life, William James observed nearly a century ago, has always been a "quest for the superfluous. Prune down his extravagance, sober him, and you undo him" (104). But what if those wants have become unearthly, their possible gratification now infinitely far off? What if, as prelude, they have created a culture and given birth to a psyche so spacy, so out of this world, that in our life-style and in our very soul we seem "due back on planet Earth"? What if we are unconsciously governed by "the unrealized shame of having failed the world"? Are such wants—which clearly no longer establish us in the necessary —still to be trusted, as James counsels?

"Man is so necessarily mad," Pascal knew, "that not to be mad would merely constitute another form of madness." "He hardly knew," Norman Mailer would write in *Of a Fire on the Moon*, confessing (characteristically in third person) similar Space Age doubts, "whether the Space Program was the noblest expression of the 20th century or the quintessential statement of our fundamental insanity. It was after all the mark of insanity that its mode of operation was distinguished by its logic—insanity was often more logical than sanity when it came to attacking a problem" (20). It may well be that even god cannot decide.