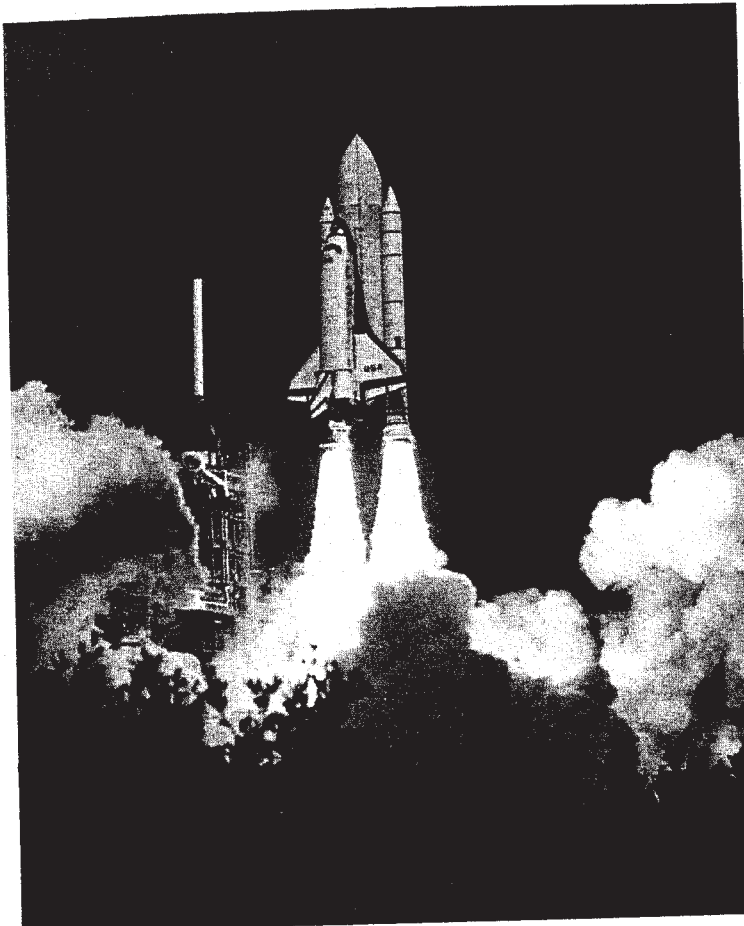


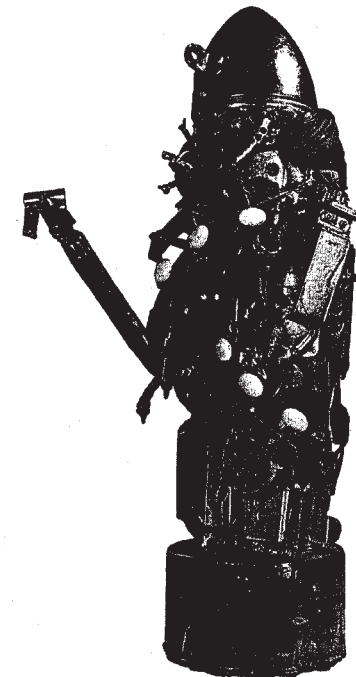
Figure I Space shuttle at lift-off



Source: NASA

has made this same point and he has beautifully illustrated the affinity in our age between painting and physics. Indeed, the overlaps which he demonstrates between the physicist's and the painter's visions are astonishing. The painter's brush and the physicist's instruments take the same measure of a new reality in the late nineteenth and early twentieth centuries. The atom fragments at roughly the same time that non-representational

Figure II Paul van Hoeydonck, *Little Cosmonaut*



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painting fragments the forms of things. It might even be said that matter conceived as fixed points in space is transformed into temporal relations at the same time that time enters the canvas of the painter. Picasso and Einstein see the same thing simultaneously. Applying a recent argument made by the poet and literary critic Frederick Turner, it might be said that 'Picasso' is a higher but less fundamental 'Einstein'. In the pyramidal image of knowledge which Turner advocates, 'the arts and humanities are a more advanced, but less basic, area of study than physics.' Indeed, stated in the most radical way, 'the arts and humanities are higher physics.'⁵ The physicist and painter envision a common reality but in different ways, and at different levels of complexity. The images of art and the events of science converge.

Technology is, I believe, a strong force in this convergence, and indeed in technology the separation of image and event is all but erased. The cosmonaut depicted in Figure II is the body fashioned and invented for the

Lift-off: we are all astronauts

I Abandoning the body

Naked exposure, stripped of clothes and skin, two electric bodies exchange a kiss. Sparks do fly, as we have always known, but here it is no mere metaphor. The kiss inflames and stirs electric circuitry into life. Touching, holding, pressing, kissing radiates, leaps beyond its boundaries, jumps the gap between two beings and fuses them as one. Meltdown at the core!

Here, at the moment of lift-off, the reader is invited to look again at Figure IV. A sun is in the background. It radiates its energy and between it and the kiss a web is generated. These electric bodies, these bodies of fusion and radiation, belong to the stars. They are bodies of atomic children, cosmic creatures.

When we previously considered this painting by Alex Grey, I indicated that its appearance in *Esquire* magazine was accompanied by a quote from the artist. 'The inside,' he said, 'tells me about the outside.' Now in reply to these words I want to say No and Yes. No, because the image itself goes further. It says more. It says the inside is the outside. All is energy and energy is all. Body melts into cosmos. And Yes, because the last four hundred years of the history of the body have been a history of this telling, of an opening of the inside to tell us about the outside. We can appreciate the significance of the latter reply when we know that the appearance of this painting in *Esquire* magazine was accompanied not only by the artist's words, but also by a photo. In that photo there is the artist and behind him the figure of a skeleton. That skeleton behind the artist who speaks these words about the inside and the outside is a witness to these last four hundred years of history. The two who kiss are not alone. They are observed.

Vesalius, whom we shall meet again later, is a witness. In 1543 he created modern anatomy. Before Vesalius the non-living body was a dead body. Dead bodies are buried with rituals of remembrance. After Vesalius the dead body became a corpse. Corpses are designed to be opened for inspection. They are invented so that the inside can be instructive about the

outside. The English physician William Harvey, whom we shall also meet again, is there too. The corpse lies still on the dissecting table. It does not move. Harvey resurrects this corpse. In 1628 he reanimates it by making the heart into a pump. A crude machine in comparison with those electric bodies, but their ancestor nonetheless. The skeleton in the background is a reminder of this lineage. Something of the corpse haunts these cosmic creatures, these electric bodies which belong to the stars.

A The corpse and the cosmonaut

The corpse is present in the figure of the Little Cosmonaut (Figure II). But it is hidden, or better, it has been transformed, re-dressed in the guise of its technical functions. The pumping heart is there and so much more. The eye of optics, the lungs of respiration define this body, a chiasm of physics and physiology. It is the medical body as an artist's dream:

All the natural activities — of hearing, breathing, speaking, and making gestures — are . . . replaced by technical functions. The body has no contact with the surrounding atmosphere; it is protected by impenetrable suits. Van Hoeydonck gave us twentieth-century man as this man created himself: an almost inhuman abstraction, further removed from nature than at any other moment in history.¹

Activity has become function: inspiration and expiration as respiration; communion as ingestion, digestion, elimination. The body is a technical matter, a problem to be solved. I know this body. We all know it. But it is known at a *distance* from life, from the body in its living situations. Vision may be a matter of what meets the eyeball, but seeing never is. The awesome power of the rising space shuttle is a sight which can take one's breath away. But that is a different matter from respiration.

An invented body! A created body! A manufactured body! And perhaps above all else a body without context, isolated from its surrounding atmosphere, a visible body, a spectacle. The inside has truly become the outside when all bodily activities have been rendered visible as technical functions. Like Le Centre Pompidou in Paris, that building with exposed interior, with its pipes and ducts, beams and girders on the outside, this body is exposed for inspection. A spectacle for observation, a specimen: nothing secret, nothing hidden, nothing shamed. Can the Little Cosmonaut blush? Can the astronautic body escape the gaze of an observing eye? The corpse, lying on the dissecting table, is pure spectacle. It is the body exposed in its isolation to the full light of objective consciousness: a blinding, antiseptic whiteness; a body of purity. So too is the body etherized on the surgeon's table, the medical body, the body as object of the medical gaze. Are we all astronauts? We are in so far as we all share this reality of the objective body, the body as

technical function. Baby Fae was given a baboon's heart and it hardly made a difference. A pump was exchanged and her mother said, 'There are a lot of sentimental ways of talking about the heart. The soul of the human is in the brain.'²

The location, of course, is not the issue. The eclipse of the *difference* between the heart as a pump and the human heart, between technical function and human activity, is the issue. Do you think that if for one of those two electric bodies the kiss is a bitter disappointment his/her *broken heart* can be fixed? It is easier to repair a broken pump than it is to heal a broken metaphor, especially when we have forgotten the difference. Without the difference, a heart cannot be broken out of love, or if it can it really does not matter. Without the difference, the broken human heart has become only a metaphor, while the pump that can be broken can be exchanged.

B *Homo sapiens astronauticus*

The body of the Little Cosmonaut is a spectacular body. It is a spectacle, a body of pure visibility, and a spectacular wonder in the sense that it is the same for all. It is an anonymous body, a democratic body, an empty shell. It is the body from which a self has taken flight and in this respect all of us truly are astronauts, perpetually 'in orbit' as Walker Percy says and perhaps also as he says 'lost in the cosmos'.³

A shell! Enshelled according to the artist! And it is true. One can see it. The Little Cosmonaut is enshelled in his/her space suit. Has a metamorphosis occurred? Has the invention, creation, and manufacture of the spectacular specimen body become a reincarnation? Is this body even to be viewed perhaps as a new stage in evolution, 'homo sapiens astronauticus', space man, cosmic woman, a universal creature?

If so, it is a very curious stage in evolution, because the body of the Little Cosmonaut amusingly resembles a kind of hard-shelled bug. The inside which has become an outside is like an exoskeleton. Is the cosmonautic body then a creature which reverses the actual movement of evolution, from the shell on the outside protecting the soft interior of the creature as is the case, for example, with crustaceans like crabs and lobsters, to the skeleton as support on the inside?

A reversal, perhaps, but no mere repetition of an earlier stage. On the contrary, the astronautic body is more a new twist in the spiral of evolution. It is the body turned inside out, re-dressed in terms of technical functions *on the way to being discarded*. It is a first step, perhaps, on a path toward 'exosomatic evolution',⁴ a temporary bridge which initially joins us and machine, and wires us to (as) a computer. As a first step the shell is an external womb and the astronaut in suit and ship a foetus. The closing scenes of *2001: A Space Odyssey* vividly portray this image, as the astronaut David Bowman, floating in an amniotic bubble, is reincarnated as a foetus

against the background of earth. A rebirth of humanity is being imagined here, a rebirth in space, but whether it is apart from earth or still in its shadows remains a mystery. In either case, however, from cybernetics to cyborgs, a new bionic woman and a six million dollar man loom on the horizon — and a new offspring, the boy Daryl in the film of the same name: *D.A.R.Y.L.: Data Analyzing Robot Youth Lifeform!*

Either as shell or embryo, the astronautic body becomes a temporary body on a path which ultimately leads to the abandonment of the body. In the generative fantasies of Timothy Leary, 'We are all neurogenetic robots'⁵ programmed to leave the earth and destined by our genes to shed this skeletal husk of the human body. From the vantage point of the Little Cosmonaut the human body of flesh and bone, blood and muscle has been a necessary but only temporary expediency. Man, says the Nobel geneticist Herman J. Muller, is 'a giant robot created by DNA to make more DNA'.⁶ In this vision, the body which belongs to the earth, which is tied to the earth by the natal bond of gravity, the body which each one of us is, is secondary. It is the genetic code which is primary and which is primarily human. We need to pause for a moment to imagine our reaction to this news. Is it a sudden, sharp sense of alienation from one's own body? Does this news make one feel like an agent of some alien force? Or is the other side a more appealing possibility? Is there some comfort in feeling guided by some higher wisdom, by a kind of universal intelligence coded as DNA?

Whatever one's reaction, no less an authority than Francis Crick, who with James Watson decoded the structure of DNA, gives the fantasy of DNA-programmed departure another twist. He speculates in his recent book *Life Itself*⁷ that the stuff of DNA could have originally come only from the stars. If that be so, then the message coded in our genes is to journey in search of home. The astronautic body, then, is destined to depart. It is a body made by DNA to engineer its departure, the invention of DNA which will allow it to return to its home in the sky. Evolution with a cosmic purpose, blueprinted as the genetic code, and all of us under the same injunction: Little Cosmonaut as E.T. — 'Phone home!'

C *The shadow of the alien*

Crick's speculation, however, has a shadow side. If the astronautic body is DNA's way of redesigning the body to depart earth in search of its original home in the stars, then the earth is not our home. We are, then, in a very fundamental sense, aliens with respect to earth.

Film portrays the mythology of an age. It is a shared myth, a cultural daydream, and as such it is in film that we obtain perhaps the best images of our alien status. In films like *E.T.*, *Alien*, *Aliens*, *Close Encounters*, *The Thing*, *2001*, *Invasion of the Body Snatchers*, and the *Star Wars* series we encounter through the alien figure reflections of who we imagine we once

were or will be. The alien is us, and in the context of Crick's proposition regarding the extra-terrestrial *origins* of life on earth, the alien creature is psychologically an image of an ancestor. In the guise of the alien creature we encounter our imagined heritage. For astronautic man/woman on the journey home, the alien figure wears the face of mother and father, the symptomatic face of our dreams of disincarnation.

But even without Crick's hypothesis, the alien still mirrors our own imagined face. Even if the earth is originally our home and the astronaut in departing is obeying another destiny coded in the genes, as Leary, for example, suggests, the alien is an encounter with an imagined future, with what we imagine we will be. As heritage and destiny, then, 'homo astronauticus' encounters himself/herself in the guise of the alien, and what is most significant in this encounter is the ambivalent character of our technological dreams of departure from earth and abandonment of the body.

The aliens of *Close Encounters*, for example, are decidedly different from those we meet in films like *Invasion of the Body Snatchers* or *The Thing*. In the former the alien is a figure of salvation; in the latter a figure of destruction. Such films, as expressions of our cultural daydreams, enact for us our optimistic hopes for, and pessimistic fears of, technology. Perhaps nowhere else is the ambivalent character of our daydreams more visible than in Japanese science fiction films. The only people on the face of the earth to have suffered the unforgettable fire of atomic war, the Japanese often instill in one and the same alien figure the dread and the hope of technology. A creature like Godzilla, for example, which is spawned by nuclear technology, is destructive and protective at the same time. In so many of these films, humanity looks to this creature for deliverance from some threatening evil, even while this creature itself is something which is feared. Moreover, the attribution of quasi-human qualities and emotions to Godzilla, while amusing and even silly, nevertheless strikes a deep chord in the human soul. It is an effort, I believe, to humanize and hence to tame the dread of technology's monstrous face. It is an effort to scale down the monstrous proportions of technology to human terms.

From the inside which tells about the outside (the corpse), through an inside which has become the outside (the two kissing figures), to a body either discarded as shell or temporarily used as embryo (Little Cosmonaut), the telos of technology's dream to refashion the body is toward abandonment of the body, toward disincarnation. This dream is, however, inseparable from the dream of departing earth. Disincarnation is a moment of departure. We can deepen our appreciation of the dream of technology, therefore, by attending to this moment.

II Departing earth

The images in Figure I and III mirror two prominent possibilities of our time. Indeed, they are the primary images of our age. The space shuttle at lift-off rises against the pull of earth's gravity, and in that powered ascent the earth grows smaller and farther away. In this image and event we have unmistakable testimony that our technological power over nature is, and always has been, a matter of obtaining distance from it. The departure of the shuttle from earth is only the latest, and perhaps most dramatic, enactment of that distance, for distance belongs to technological knowledge as much as nearness belongs to intimate knowledge, to what might be called a knowledge of the heart. To know one's own body as a technical function, to know that the heart is, for example, a pump, requires a measure of distance neither obtainable nor suitable in the context of daily life. Although one may know one's body and heart in this fashion, they are known in this way only on the condition that one withdraws from them, that one places between oneself and the passion of one's heart, which in thirsting for knowledge of the other whom one loves necessarily draws near to that other, a distance which is not a matter of measure but of attitude.

Joseph Weizenbaum, one of the early pioneers of computer technology, portrays this dream of technology as distance in his work. Describing the role played by a group of American scientists in advising the Defense Department during the Vietnam war, Weizenbaum writes:

These men were able to give the counsel they gave because they were operating at an enormous psychological distance from the people who would be maimed and killed by the weapons systems that would result from the ideas they communicated to their sponsors. The lesson, therefore, is that the scientist and technologist must, by acts of will and of the imagination, actively strive to reduce such psychological distances, to counter the forces that tend to remove him from the consequences of his actions.⁸

Weizenbaum's work, moreover, insists that unless such acts of will and imagination occur, unless the distance between us and nature, between us and our own bodies, between us, is recognized, acknowledged, and understood, the final consequence of this power to distance ourselves from our bodies and from earth will quite probably be disaster. His words on this matter are quite direct:

Even physicians, formerly a culture's very symbol of power, are powerless as they increasingly become mere conduits between their patients and the major drug manufacturers. Patients, in turn, are more and more merely passive objects on whom cures are wrought and to whom things

are done. Their own inner healing resources, their capacities for self-reintegration, whether psychic or physical, are more and more regarded as irrelevant in a medicine that can hardly distinguish a human patient from a manufactured object. The now ascendant biofeedback movement may be the penultimate act in the drama separating man from nature; man no longer even senses himself, his body directly, but only through buzzing sounds produced by instruments attached to him as speedometers are attached to automobiles. The ultimate act of the drama is, of course, the final holocaust that wipes life out altogether.⁹

That ultimate act of the drama, to which Weizenbaum alludes, is, of course, the image in Figure III, the fiery mushroom cloud of a nuclear explosion. That act is and would be the ultimate distance. Weizenbaum's words, however, make it quite clear that this ultimate separation is part of a larger web of occurrences which reaches into the fabric of our daily lives. In a sense, he is saying that the bomb is already present in the distance we put between ourselves and our bodies, in the ways in which the body has become, for example, an object of medicine. The bomb is *not* an exterior thing lying outside the circumstances of our living. If it is the final act it is *not* the period of the last sentence in the story of technology. Rather, it is already written into the letters and words, the sentences and the paragraphs which make up the tale. In these everyday acts of distancing, the bomb has already been armed. Indeed, in a sense it has already exploded.

We live in the year 44 PH, the forty fourth year after the atomic bombing of Hiroshima and Nagasaki. The nuclear bomb is a central image of contemporary life. We live forevermore in a nuclear-armed world. Even with total disarmament, the bomb, as Jonathan Schell¹⁰ points out, can never be dis-invented, because we shall forevermore have the knowledge to build it. This one unalterable fact links together the images of Figures I and III. In their connection a deeper sense of technology as departure becomes visible.

A Flight as escape

In Walter Miller's classic science fiction novel, *A Canticle for Leibowitz*, first written in 1959, the two images of space flight and nuclear annihilation are wedded. The world, already once devastated by a nuclear holocaust, has resurrected itself out of the ashes, and after long centuries of struggle it has once again risen to the level of technological civilization. At the close of the novel, however, the world teeters again on the brink of catastrophe, and as the novel ends the sky erupts in fiery explosions as a group of monks, who for centuries had preserved remnants of the ancient knowledge, prepare to depart.

They sang as they lifted the children into the ship. They sang old space chanteys and helped the children up the ladder one at a time and into the hands of the sisters. They sang heartily to dispel the fright of the little ones. When the horizon erupted, the singing stopped. They passed the last child up into the ship.

The horizon came alive with flashes as the monks mounted the ladder. The horizon became a red glow. A distant cloudbank was born where no cloud had been. The monks on the ladder looked away from the flashes. When the flashes were gone, they looked back.

The visage of Lucifer mushroomed into hideousness above the cloudbank, rising slowly like some titan climbing to its feet after ages of imprisonment in the Earth.

Someone barked an order. The monks began climbing again. Soon they were all inside the ship.

The last monk, upon entering, paused in the lock. He stood up in the open hatchway and took off his sandals. '*Sic transit Mundus*,' he murmured, looking back at the glow. He slapped the soles of his sandals together, beating the dust out of them. The glow was engulfing a third of the heavens. He scratched his beard, took one last look at the ocean, then stepped back and closed the hatch.

There came a blur, a glare of light, a high thin whirring sound, and the starship thrust itself heavenward.¹¹

Miller's tale indicates that the fires of lift-off are akin to the fires of destruction. The rocket is, psychologically speaking, powered by the fires of nuclear annihilation. Indeed, the fires of nuclear catastrophe are the symptomatic side of the fires of departure. Wedded in this fashion, departure takes on the character of psychological necessity. On an earth wired for destruction, space flight becomes a means of escape.

As disturbing as it may be to recognize that our departure is motivated as escape, it may be even more disturbing to realize that this connection between departure and destruction also works the other way. An earth from which we *can* depart, an earth from which we *can* escape, is one whose destruction would be less of a catastrophe. To be sure, this is a difficult notion to accept, but consider that something of this motive is already apparent in Francis Crick's perception of the earth as originally not our home. Earth so regarded is already psychologically abandoned. The ground, literally and figuratively speaking, is already prepared for lessening the impact of destruction. I am not saying here that such destruction is intentionally pursued. Rather, I am saying that the possibility of departure from earth is a way of lessening the emotional effects of the fear of its destruction. I am saying that the two images work upon each other, feed upon each other, as it were, creating an emotionally laden vicious circle. Threatened with destruction, as imaged in the nuclear cloud, there is the

need to escape, imaged as space flight. And feeling the need to escape, as promised in the possibility of space flight, it becomes necessary to devalue the earth we would leave behind, to lessen the impact of the loss.

The image of home is perhaps the oldest, deepest, and most powerful image of the human soul. In stripping the earth of this image, we sever its hold upon us and thereby deaden for ourselves the impact of its loss. Initially devalued, the emotional disaster of its loss is somewhat tamed.

This effort is, of course, an illusion, but illusions become necessary when reality is too hard to bear. The destruction of the earth is, for the incarnated human soul, whose entire history is inseparable from and has been shaped by its place on the earth, an unbearable reality. At the most primitive and emotionally powerful levels, the very rhythms of the earth — the tides of the sea, the cycles of the seasons, the rising and the setting of the sun — have been a kind of guarantee of our own continuity. In knowing them, something of us, not individually but collectively, is also known, recognized and acknowledged. In the most extreme circumstances, we have been able to believe that there will always be another tomorrow.

But what if tomorrow when the sun rises there is no living human being to see it? Then the earth which has linked together the generations of humanity falls into a kind of sleep, and we are forevermore forgotten.

The breakers beat monotonously at the shores, casting up driftwood. An abandoned seaplane floated beyond the breakers. After a while the breakers caught the seaplane and threw it on the shore with the driftwood. It tilted and fractured a wing. There were shrimp carousing in the breakers, and the whiting that fed on the shrimp, and the shark that munched on the whiting and found them admirable, in the sportive brutality of the sea.

A wind came across the ocean, sweeping with it a pall of fine white ash. The ash fell into the sea and into the breakers. The breakers washed dead shrimp ashore with the driftwood, then they washed up the whiting. The shark swam out to his deepest waters, and brooded in the old clean currents. He was very hungry that season.¹²

That is the end of Walter Miller's tale. After the bomb and even after departure, for those few who have *perhaps* managed it, there is one final movement in the drama, never to be witnessed, only to be imagined. Oblivion! Consider the tides continuing their relentless pursuit upon the shores! Or consider the sun still rising and setting in its perpetual round! Or the wind without sound blowing its way across barren fields! And consider all this now occurring apart from our presence and even indifferent to our absence! Even the dinosaurs never passed into such complete and total darkness. These things, these simple rhythms of nature, which once were a guarantee, become in the light of the bomb a testament to our oblivion.

There is sufficient anxiety in these considerations to fire wishes, however illusory, to lessen the impact of earth's destruction, to devalue it and thereby diminish its loss, and to prepare for and to pursue our departure.

That we do numb ourselves to this loss has been indicated in another way by Paul Boyer in his recent book, *By the Bomb's Early Light*. Speaking about television, a very concrete and universal expression of our technological world, and speaking specifically about how difficult it has been for this medium to awaken us to the horrors of nuclear catastrophe, he notes that, '*The Day After* had less impact than predicted.' We lessened its emotional effects, devaluing it much as we have devalued the earth to lessen its loss. 'Perhaps,' he then writes, 'the only adequate television treatment of nuclear war would be two hours of a totally blank screen in prime time.' Would we be able to pull off the same psychological trick of devaluation here, with this habit of television viewing so close to home, as we perhaps can do with the earth? Or would we perhaps be forced to admit that our world does matter, even in something as simple as our television habits and preferences? If we could do the latter, then perhaps the possibility of departure, from the earth and from the world we have built upon it, would no longer require that initial devaluation which makes their destruction less of a catastrophe. If the earth and the things of our world could again begin to matter, if we could allow ourselves to feel again the pain of their loss, then the insidious connection between the images of space flight and nuclear annihilation might be broken. Then, threatened with destruction, imaged as nuclear annihilation, the need to escape, imaged as space flight, might *not* lead to that act of devaluation yielding the illusion of a lessened catastrophe. Then, threatened with destruction, we might in the face of the bomb reaffirm our connection to the things of the world and to the earth. Out of distance we might draw closer, to be touched again by these things and by the earth. And in this context, we might recover other motives for space flight, for our journey to the stars. As Boyer, however, asks, of his television suggestion, 'But who would sponsor it?'¹³ And that is, as we shall see, a key issue of technology. Having dominated the earth out of our increasing distance from it, we have come to believe that we are masters, and even creators. And in so doing, we have lost the sense that we are *sponsored*, which means supported, upheld, and already sent on the way. In this respect, we have lost something of the *religious* sense of human life, in the root meaning of that term, the sense that we are already bound, and connected to, and limited by something beyond ourselves. In breaking the bond of gravity we have broken more than a physical restraint. We have broken the spiritual condition of humanity.

The artist Alex Grey again offers us a visual presentation of our theme. Entitled *Nuclear Crucifixion* (Figure 1.1), it disturbingly juxtaposes not only two dominant symbols, but also two different world views. The figure of Christ crucified makes sense within a world where issues of sin,

Figure 1.1 Alex Grey, *Nuclear Crucifixion*, 1980

Source: Stux Gallery, New York

redemption, and salvation belong. The figure of the mushroom cloud of nuclear annihilation belongs to a world which almost completely cancels that symbol and has fallen asleep to those issues. Cloud eclipses cross, crucifying it, as it were, on a fiery cross of hubris, fashioned out of the arrogant and unchecked use of our power. In the clash of these two symbols, however, we may be shocked enough to ask the question of who, then, can *sponsor* a reawakening? Or what? And shocked enough to wonder if such a reawakening, a new genesis of humanity's spiritual condition, is possible in a technological age? From within technology and not outside it, we need to consider whether the dream of technology itself can spur such an awakening.

III Escaping death

In the epilogue to his book *Time of Need*, a reflection on the life of the imagination in our technological century, William Barrett writes that 'That mere leap into space by itself does not signify.' Rather, 'it is as a symbol that it captures the imagination, a symbol of the departure from the earth in which we are all swept along.'¹⁴ In the long journey down the corridor of evolution, along with all the other species of life which have inhabited this planet, we have been nurtured and nourished, sponsored by the earth. Now, having refashioned ourselves in our own image, we stand alone poised to depart, to break free of that natal bond which gave shape to who and what we are. There on the launchpad we can awaken to a new beginning or our final end. Departure can be another step in the history of human evolution or the harbinger of its end. The *event* of departure as *symbol* has multiple possibilities.

Timothy Leary, in a brilliant and hilarious commentary on the sixties, *Neuropolitics*, celebrates the symbol of departure as a new and necessary beginning. 'Space migration,' he writes, 'is the inevitable next step in evolution,'¹⁵ and he has even coined a memorable slogan for our departure. It is S.M.I.²L.E.: Space Migration, Intelligence Increase, Life Extension. Indeed, something of the character of the manifesto marks his words:

We live at the bottom of a 40-mile gravity well. It has taken all of four and a half billion years of terrestrial evolution to produce nervous systems capable of devising a technology with which to climb out of that well and launch migratory-colonization cylinders into space. There is no reason for us to ever climb back down into such a planetary hole again. Our evolutionary mission is to fly free through timespace. The original sin of 'Genesis' is gravity: the fall.¹⁶

Others share this optimism, viewing the continuing tie to the earth as a kind of retardation of the species, as illustrated for example in Isaac

Asimov's now famous phrase, 'planetary chauvinism',¹⁷ which is vividly descriptive and diagnostic of how he perceives those who would temper such optimism. But even without the optimism, there are those for whom the event of departure symbolizes a step which must be taken. In the vision of one like Gerard O'Neill,¹⁸ for example, colonizing the higher frontier of space is the only solution to the four major problems which are a consequence of the limited size of earth. Without departure and colonization, the swelling population of earth will fast deplete our supplies of energy, food, and living space. For O'Neill departure is necessary in order to survive.

O'Neill, Asimov, and Leary characterize earth departure in different ways, but in each characterization there is, I believe, a shadow which is ignored. To discover its presence we need to turn to Barrett once again.

Noting the conjunction in our age of our knowledge of the stars and of the primitive peoples of the earth, Barrett writes: 'The appearance of space man seems secretly timed with the disappearance of archaic man. Primitive peoples are in fact dying off or being drawn into the orbit of civilization so rapidly that in a few years there will be no more left.'¹⁹ What does this disappearance of archaic man indicate about the character of our departure?

The body of the space man, as illustrated in the figure of the Little Cosmonaut, is a body of technical functions, a body created or born in and made for distance from the earth. As a body of departure it is a body apart from the earth. In contrast, the body of archaic man is a body of ritual, a body in intimate connection with the earth, a body which is a part of the earth. And just as we are all swept along in the symbol of departure, just as we are all astronauts, so too do we all remain, at least for the moment, a primitive body rooted to the earth, a body which, if not of ritual and remembrance, still remains at least a body of human activity within the layers of technical functions by which it is enshelled. In this context, then, the disappearance of archaic man indicates a war we are waging against the body of life. This disappearance is perhaps nothing less than a displaced expression of the increasing objectification and medicalization of our own bodies, processes which replace flesh with function.

To displace the body which is a *part* of the earth by a body which is *apart* from it, to displace flesh by function, to wage a war with the body of life, is, however, to symbolize in our departure from earth a dream of escaping death. The archaic body about which Barrett speaks, this primitive body which in ritual performances like burial practices remembers its ties to earth, is a living body. In contrast with a technical body, which can cease functioning, a living body is one which dies. The conjunction of space man's appearance and archaic man's disappearance is, therefore, nothing other than a harbinger of our wish to take leave of a flesh so fragile and so frail, flesh which is always finally heir to death.

Departure as a flight from death is a dream of technological humanity. 'Homo Faber' or 'Technological Man,' as Jeremy Rifkin puts it, 'wants to

overcome death.'²⁰ But that is an impossible dream, in part because in order to escape death our departure from earth would have to be total and complete. As Barrett, however, again notes, although 'one part of our knowledge provides us with the instruments to get free of earth, another part tells us how much, deep down, we are formed of the muck and slime of that same earth from which we can never be quit.'²¹ We carry death with ourselves, therefore, as deeply as we carry earth with ourselves as embodied creatures. We carry death as carnal knowledge. To escape death, then, we would have to do more than simply depart earth, more than simply break that natal bond of gravity between body and earth, that bond inscribed in our flesh by which the earth holds fast its claim upon the body and finally reclaims it. In our departure, we would even have to do more than destroy the earth, because we would still carry within ourselves, within every bone and muscle, within every gesture, a living reminder of our tie to earth. To cheat life of the death we owe it we would have to cleanse ourselves completely and totally of all that, of every touch, taste, and smell of matter, of its stench of corruption. To defeat death we would have to rid ourselves of the scourge of aging and its signs of decay. To conquer death we would have to purify ourselves of all traces of how we matter. Our ascent would have to be an act of purification. Our departure, perhaps reminiscent of the fall but reversed by the will of technological humanity, would have to be as angels.

What we would deny returns, however, as symptom, and in this light the threatened archaic body of humanity, coincident in its increasing disappearance with the appearance of the astronautic body of humanity, struggles to hold a place for death in the midst of human life. It is a symptom of our flight from death, a reminder, therefore, that as carnal creatures we do owe life a death. This body, however, maintains a precarious existence, present as it is on the margins of technological culture and, as Barrett notes, increasingly threatened by extinction. Moreover, this body, a body of human activity in contrast with technical function, is becoming increasingly marginal even within technological culture, as we remake the body in terms of the image and definition of the Little Cosmonaut.

Symptoms ignored, however, do not disappear, and thus the death we would deny only appears elsewhere, perhaps in more virulent forms. For example, are our diseases, especially those of epidemic proportions, symptoms of cultural denials? In a recent book edited by David Levin,²² several investigators from diverse fields propose and examine such a notion, and it is within this context that we may wonder if we have already gone so far along the road of fashioning the body apart from earth, an astronautic body whose shadow side is that of the alien, that the living body increasingly distant from the earth has itself become so alien that it no longer has its natural defenses? In short, is AIDS a cultural symptom of the alienation of ourselves from our bodies, a disease of the 'alien'? As questionable as

this might appear, already we tend to perceive AIDS in this fashion, in so far as we struggle to keep it associated with those whom we would regard as alien to the mainstream of society, to gays and drug users. In this regard, then, do we unknowingly and unwittingly arrange for our diseases to carry the shadow of our culture, and, more to the point here, do we 'choose' and designate victims to suffer our cultural symptoms?

We need not, however, limit ourselves to this suggestion, because the death we would deny is more immediately apparent in another virulent return. In our dream of escaping death by departing earth we have surrounded ourselves with it. We court death even as we would flee it. The earth we would depart is also the earth we have wired for destruction. Thus the death we would escape comes back to haunt us in the shape of the nuclear cloud of annihilation. In this form, the death we would shun embraces us. In this respect, the death from which we would depart becomes the bomb as cultural symptom.

IV Turning the dream

On the launchpad we stand alone and it is there, more than in any place in our present world, that the distance which has marked our technological mastery of the earth is most visible. There on the launchpad we get some rough measure of how far we have come along the long road of evolution toward separating ourselves from the earth and the rest of creation. Truly as astronautic man and woman we stand isolated and apart, the new masters of creation, and it is an *awe-ful* vision. That it promises a new beginning there is little doubt. But that it is equally harbinger of a final end must also be considered, for we have arrived at this point by becoming, in the fine phrase of Loren Eiseley, 'world eaters',²³ energy consumers on a planetary scale.

In attending to the dream of technology we have assumed that technology is humanity's dream. That is quite natural. But what if, as James Hillman notes about dreams,²⁴ we are in the dream and the dream is not in us? Then, perhaps, something which Loren Eiseley has wondered about in one of his more melancholic visions becomes plausible. Suppose technology is the earth's dream? Suppose it is the earth's way of cleansing itself of the 'planet virus' called humanity, of ridding itself of those wishes and dreams which would court its own destruction. 'The fruition time of the planet virus is at hand' Eiseley says,²⁵ by which he means our rocket century. It is, I agree, a fanciful notion. But what if from earth's point of view technology is a dream, an experiment in self-knowledge, which has failed? On the launchpad, alone, at least we have to wonder about technology from nature's point of view. And perhaps *in* that wondering there is the beginning of an awakening, a way in which we can hear the earth's dream and become agents more of construction than destruction. Maybe we need to learn

only how to listen. 'Earth, isn't this what you want: an invisible re-arising in us?'²⁶

V On the launchpad

In this moment of lift-off we have attended to technology as symptom and dream by attending to some of its images. Later, in the final chapter, at the moment of re-entry, we will return to technology as symptom and dream and attend again to its images. In between these two moments, however, we will inquire into how we have arrived at this place of departure, bearing these dreams of distance and disincarnation and their shadow sides of annihilation and a flight from death. To do so, we need to listen to the dreamer, since every dream is dreamed by a dreamer. History will be this dreamer for us, and we will journey through history and attend to the story which has fabricated these dreams, to those historical events and happenings from which the images of these dreams have been woven. Lest there be cause for misunderstanding, however, we shall listen to the dreamer's tale, to these events and happenings of history, with our ear already attuned to the shadows. In other words, we will take this journey already carrying the images of technology as symptom and dream. These images will be the background, the depth, from which we will listen to this tale.

The journey begins in the next chapter with a tale of beginnings, with a consideration of how the dream of mastery through distance originates in the imaginal eye of the artist some five hundred years ago. It is a tale about windows and cameras, a story about vision and the hegemony of the eye. It is a tale, finally, of how the artistic technique of perspective vision, in becoming a cultural habit of mind, transforms the landscape of the world, the geography of the soul.

In subsequent chapters, we will discover how within this landscape of linear perspective vision the self becomes a spectator ensconced behind his or her window on the world, how the body, now divorced from this self, becomes a specimen, and how the world, as a matter for this detached and observing eye, becomes a spectacle. Then, in a final chapter, at the apogee of our journey after lift-off, we will attend to how technology itself, as a story of departure, may also be the possibility of return, remembrance, renewal, a return which is not just a going back home but a coming home, perhaps, with a nod to the poet Eliot, to know the place for the first time.²⁷

The window and the camera

I A window on the world

J. H. van den Berg¹ has written extensively on how the cultural world mirrors or reflects the changing nature of humanity. We who live in the twentieth century differ as much from men and women of the Middle Ages as their world differs from ours. Van den Berg has specifically considered the history of western Church architecture in this way, demonstrating how humanity's changing conceptions of spirituality and the space of the world are reflected in these transformations. Architecture is a visible expression of how a specific historical-cultural era shapes its space and draws its boundaries between the inside and the outside. Church architecture in particular reveals how an age carves in stone its boundaries of the sacred and profane.

Painting also provides this kind of mirror through which we can read the image which an age has of itself and the world. As a celebration of the visible world painting reflects, among other things, not only the ideas which a particular age has about the space of the world and its place within that space, but also the space itself of that world. The canvas records not only the style of the painter but also the style of the world in which he or she lives and paints. A Cezanne canvas radically differs from one by da Vinci, and that difference attests to the different worlds in which each has lived *and* to the different eyes with which each has perceived his world. Between a da Vinci and a Cezanne the human world and the human eye have changed. Painting indicates not only that styles of human perception change but also that the world itself changes.

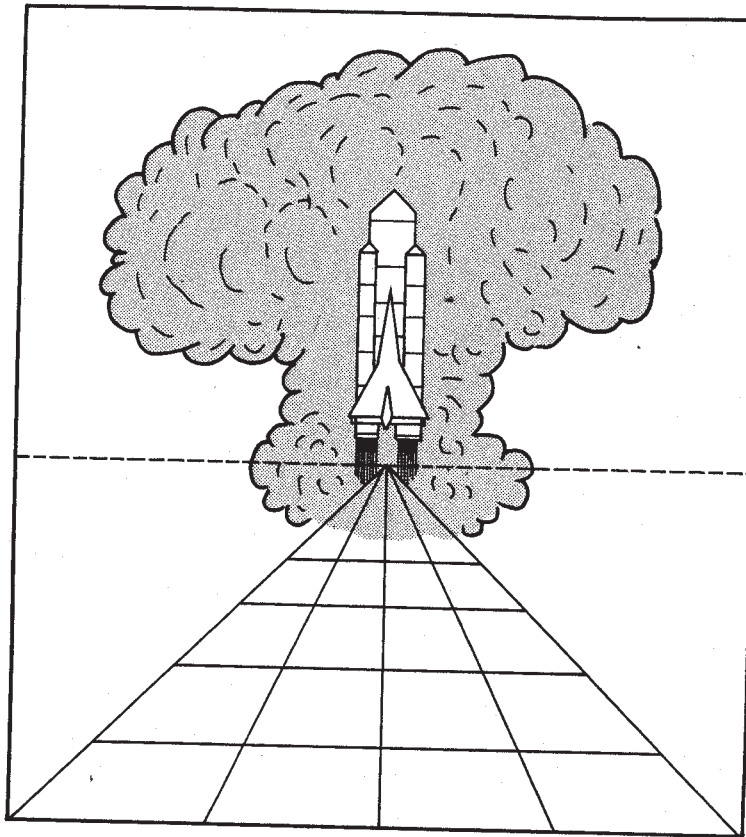
The invention of linear perspective painting in fifteenth-century Italy is one such moment of change, and the tale to be told in this chapter concerns how the invention and development of this artistic technique became the cultural vision which has shaped our contemporary technological world. Linear perspective vision, in the words of art historian Samuel Y. Edgerton, is 'the "innate" geometry in our eyes,'² and although this way of perceiving space is no more natural to humanity than, say, a Picasso canvas in which

multiple perspectives appear simultaneously, the latter remains for us abstract and unreal while the former defines for us what is real and what is natural. Before we know that we know it, we have learned to see the world as a three-dimensional plane where depth is a matter of spatial distance from the viewer and where all objects decrease in size as they recede from the viewer toward a vanishing point. In short, before we know that we know it, we have learned to see the world as if we were focusing through the lens of a camera, or as if we were standing on a railroad track looking at the parallel rails converging in the distance.

What linear perspective vision achieves is a kind of geometrization of the space of the world, and within that space we become observers of a world which has become an object of observation. Linear perspective is a celebration of the eye of distance, a created convention which not only extends and elaborates the natural power of vision to survey things from afar, but also elevates that power into a method, a way of knowing, which has defined for us the world with which we are so readily familiar. It is the transformation of the eye into a technology and a redefinition of the world to suit the eye, a world of maps and charts, blueprints and diagrams, the world in which we are, among other things, silent readers of the printed word and users of the camera, the world, finally, in which we have all become astronauts.

To assign so much importance to an artistic technique invented over 500 years ago may seem, however, to be too bold a claim, the consequence perhaps of too liberal an imagination. And yet that this technique, a way of representing three-dimensional space on the two-dimensional plane of a canvas, has become a cultural vision is beyond doubt. The art historian Helen Gardner notes, for example, that linear perspective 'made possible scale drawings, maps, charts, graphs, and diagrams — those means of exact representation without which modern science and technology would be impossible.'³ And William Ivins, noted cultural historian, supports this view. 'Many reasons are assigned for the mechanization of life and industry during the nineteenth century,' he says, 'but the mathematical development of perspective was absolutely prerequisite to it.'⁴ Finally, as if to secure this point beyond any shadow of doubt, Samuel Edgerton notes that 'space capsules built for zero gravity, astronomical equipment for demarcating so-called black holes, atom smashers which prove the existence of anti-matter — these are the end products of the discovered vanishing point.'⁵ Linear perspective, artistic technique become cultural vision, is central, therefore, to the story of technology being told in this work, and in its invention we shall find something of the origins of those dreams of distance, departure, and disincarnation which have already been mentioned. In continuing our story in this fashion we shall hear how linear perspective vision, in making the eye the world's measure, has transformed the self into a spectator, the world into a spectacle, and the body into a specimen. We shall hear how this vision has become our window on the world. Before we continue the tale,

Figure 2.1 Vanishing point as launchpad to the stars



Drawing by Liota Odom

however, it will serve us well to gather in the image presented in Figure 2.1 the things which have already been spoken. The vanishing point is the launchpad of the modern world. It is there, in that distance and at that point where the figure of the astronaut, already reincarnated for departure, takes leave of the world.

II Linear perspective: some necessary technical considerations

A An opening image

To begin our discussion of some of the necessary technical matters involved in linear perspective technique, let us first familiarize ourselves with our own linear perspective style of vision, that innate geometry of our eyes. To do so, consider the two illustrations of the city of Florence presented in Figures 2.2 and 2.3. The first one dates from approximately 1350 while the second one, known today as *Map with a Chain*, dates from about 1480. They lie on either side of the invention in 1425 of the technique of linear perspective by Filippo Brunelleschi and later codified in Leon Battista Alberti's treatise on painting, *De Pictura*, which was published in 1435–6. Between these two paintings there is a world of difference; between them a new world has emerged.

Perhaps what is most striking about the earlier portrayal is its sense of clutter and confusion. The buildings of the city crowd in upon each other, presenting a multiplicity of perspectives simultaneously. Our eyes cannot find any one point from which to view the city, and in this respect the painting may remind us of a young child's drawing of his or her house, in which front, side, and back views are given all at once. Indeed, from the point of view of the later painting we might be tempted to dismiss this earlier one as naive, crediting to the later view a more realistic presentation.

The later view is not, however, more real, and such a judgement would express only our preference for what has become most familiar. The difference between the two views is not a matter of the real and the unreal. It is rather a difference between one world and another. 'The painter of the earlier picture,' Edgerton says, 'did not conceive of his subject in terms of *spatial homogeneity*.' On the contrary, his painting reflects a belief that 'he could render what he saw before his eyes convincingly by representing what it felt like to *walk about*, experiencing structures, almost *tactilely*, from many different sides, rather than from a *single, overall vantage*.'⁶ In short, what we have with this earlier painting is a rather vivid impression of what it must have been like to live in another, earlier, medieval world. The painting tells us that it was a world marked by time and by the presence of the body in the midst of things. If we find it confusing, then it is because there is time and body in this earlier painting. If we find it confusing, it is because with the advent of linear perspective vision we have managed to spatialize time, to distance ourselves from the body, and to remove ourselves from the midst of things. It is confusing because it is a city which has not yet become for us a spatial landscape mapped by a bird's eye view.

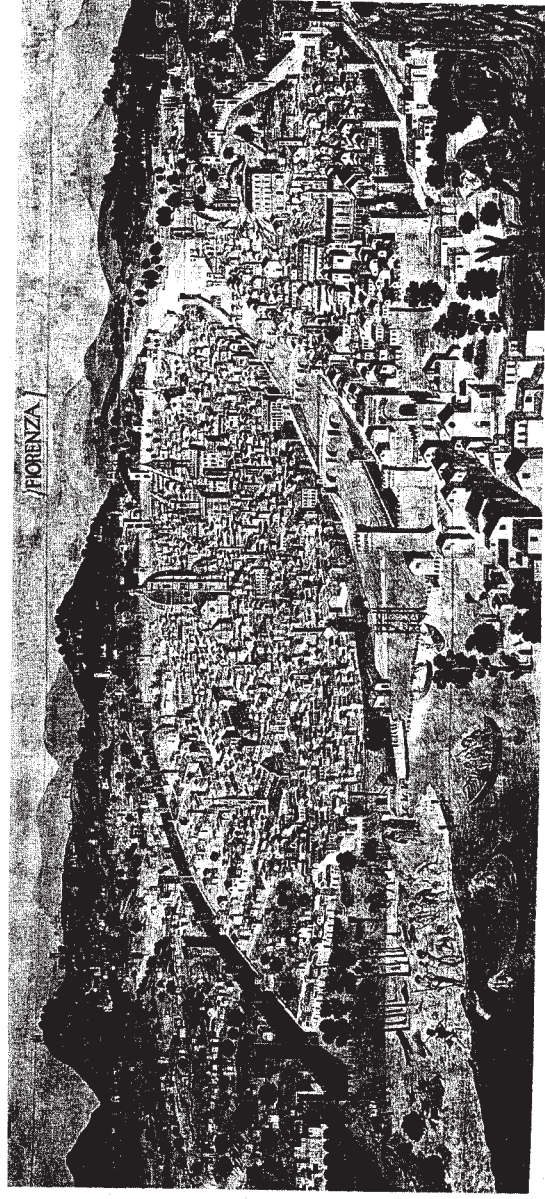
The Florence of 1480 which is depicted in Figure 2.3 is, however, such a city. It offers that bird's eye view above the city, a 'fixed viewpoint' in Edgerton's terms, which is 'elevated and distant, completely out of plastic or sensory reach of the depicted city.'⁷ It is the perspective of the figure in

Figure 2.2 Panorama of Florence, fresco, Loggia Del Bigallo



Reproduced by courtesy of Alinari/Art Resource, New York

Figure 2.3 Map of Florence: copy of the Carta Della Catena, Museo de Firenze Com'era, Florence



Reproduced by permission of Marburg/Art Resource, New York

the lower right hand corner of the painting, the man on the hill above the city with his sketchpad in hand. Is he, perhaps, sketching a map of the city? Of course, we cannot know. But we can know that from his high-altitude vantage point he is a man of distant vision, perhaps the first expression of the self we have become, perhaps even, we might say, the father of the astronaut. Seated there as he is above the city, he incarnates at its birth a new ideal of knowledge according to which the further we remove ourselves from the world the better we can know it. It is an ideal, however, which by definition means a knowledge of the world which is increasingly disincarnate. On the hill above the city only his eyes remain 'in touch' with the world observed below. But at that distance such eyes, unrelated, for example, to ears and hands, can no longer know the words of anger or of love uttered by those *living* in the city.

One looks at this anonymous work painted so long ago and one recognizes a kinship with the perspective it portrays. It is a view with which we are familiar, a perspective which finds a favorable reception in the geometry of our eyes, in the way in which we perceive the world. Closer in chronological time to the earlier view of Florence than it is to our time, it is nevertheless culturally and psychologically closer to us, and anyone who has ever approached a city in an airplane can affirm this affinity. And yet while this later view of Florence manifests that style of vision which defines for us what is real and which we unquestioningly regard as natural, we still retain in our muscles and bones, so to speak, the vision of the world depicted in the earlier view. That earlier view, as Edgerton notes, is, for example, the truth for the tourist arriving for the first time in a strange city with heavy baggage and an unfamiliar hotel address in hand. It is the truth of the city inscribed in one's tired legs, aching feet, and sore shoulders. It is the city measured not by the gaze of the distant eye but by the history of the body. Regardless, therefore, of the distance which we practice and achieve, we remain in our everyday living situations bodily creatures with a carnal knowledge of the world. It persists, this life of the body, in the shadows of our technological vision, forming the underside of our technological world. In treating next a few key points of Alberti's linear perspective technique, we shall hear how the body fares at the origins of this tale of technology.

B Alberti's linear perspective technique

Alberti's procedure for making a linear perspective drawing involves two steps: the construction of a vanishing point and of a distance point. We shall follow his procedure in somewhat simplified form and indicate several conditions and implications of these two steps which have shaped and influenced our sense of body, self, and the things of the world.⁸

1 The vanishing point

The term 'vanishing point' is not Alberti's. It is of more recent coinage. Alberti's term was the *centre point*, which, interestingly enough, was also called in his time the *punto di fuga*, the point of flight. At the outset of our consideration, therefore, echoes of our earlier discussion about flight and departure are heard, and we recall here Edgerton's comment about how our space flight technology is the product of the discovered vanishing point. Perhaps the way in which the first historical and cultural appearance of a phenomenon is named contains a nascent wisdom and genius (or even wish?) concerning its nature and its destiny. We shall hold on to this earliest designation, even though we shall make use of the term which has become the convention.

The construction of the vanishing point is a relatively simple procedure, and Alberti speaks of it in this fashion:

First of all, on the surface on which I am going to paint, I draw a rectangle of whatever size I want, *which I regard as an open window through which the subject to be painted is seen*; and I decide how large I wish the human figures in the painting to be. I divide the height of this man into three parts, which will be proportional to the measure commonly called a *braccio* [approximately two feet]. With this measure I divide the bottom line of my rectangle into as many parts as it will hold Then I establish a point in the rectangle wherever I wish; and [as] it occupies the place where the centric ray strikes, I shall call this the centric point. The suitable position for this centric point is no higher from the base line than the height of the man to be represented in the painting, *for in this way both the viewers and the objects in the painting will seem to be on the same plane*. Having placed the centric point, I draw lines from it to each of the divisions on the base line.⁹

A bit later in the text Alberti adds that a horizontal is to be drawn through the centric point. This line, which today is called the horizon, was termed the 'centric line' by Alberti. It is important to note that this line sets the limit for the height of any object to be depicted in the painting and that it is *fixed* at the eye level of an observer imagined to be standing on a horizontal plane and *staring straight ahead* at the world. This last point means that the centric line, the horizon, is identical with the viewer's eye level, that the centric or vanishing point and the viewer's eye always lie on the same plane. In this respect each of us, as Edgerton notes, is like a viewer who stands at the water's edge and looks out to the ocean. One's eye level is always synonymous with the horizon which rises and falls in exact concordance with one's position, provided the viewer continues to stare straight ahead. Edgerton notes that this concordance of vanishing point and horizon line, the viewer's eye level, was Brunelleschi's most important discovery.