The Social Construction of Space in a Computerized Environment

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Contents:

Chapter 1: Introduction and overview

> The promise of the Information Age is the unleashing of unprecedented productive capacity by the power of the mind. I think therefore I produce. In so doing, we will have the leisure to experiment with spirituality, and the opportunity of reconciliation with nature, without sacrificing the material well-being of our children. The dream of the Enlightenment, that reason and science would solve the problems of humankind, is within reach (Castells, 1998: 359).

This is how Manuel Castells, one of the foremost analysts of the so-called new economy, characterizes the utopian vision of the networked society. Variations on this declaration appear in the writings of the numerous proponents, from Douglas Rushkoff (1994), enamoured with the New Age promises, to the rightist frontier nostalgia of John Barlow (1996). The message is always clear: it is the dawn of the new age, and radical changes will allow humankind to finally realize its potential.

Meanwhile, critics of the information revolution predict dire consequences of the unchecked growth of network technologies. Orwell's *1984* and Kafka's *Trial* are commonly invoked, and the Foucauldian panopticon looms in the immediate future:

> With the thrill of free access to unlimited corridors of information comes the complementary threat of total organization. Beneath the artificial harmony lies the possibility of surveillance by the all-knowing Central System Monad. The absolute sysop[1] wields invisible power over all members of the network (Heim, 1991: 79).

Indeed, the subjugation of humankind does not begin with networking. Even standalone computers (that is those not connected to any networks) present a danger to human

[1]System operator; the network maintenance specialist whose duties often involve supervising the users' adherence to the prescribed code of behaviour—JK.

freedom and expression, and can serve as a means of replacing culture with technical rationality, for the computer

> subordinates the claims of our nature, our biology, our emotions, our spirituality. The computer claims sovereignty over the whole range of human experience, and supports its claim by showing that it "thinks" better than we can (Postman, 1992: 111).

As the above quotes indicate, there is considerable dissent over the valuation of the effects of the new technologies on social life and the human (or posthuman, as the case may be) condition. Most studies, however, agree that the emergence of computer networking is having a considerable impact on the contemporary social institutions and is instrumental in shaping the lives and work practices of people across the globe. Unlike the visions of rosy or apocalyptic future, the acknowledgement of such impact is usually based on the already available technologies:

> Through the introduction of modems, CD-ROM discs and Internet facilities such as electronic mail and electronic bulletin boards, the microcomputer has enabled and encouraged millions of people to change the structure of their stream of social interaction in significant ways (Eriksen, 1995: 187).

That said, it has to be noted that an initial acknowledgement of the computer revolution necessarily means its support in further analysis. David Hakken (1999) cautions that while most cyberspace ethnographers begin by framing their study within the rhetoric of radical change, their analyses tend to support a more conservative viewpoint: continuity of institutions is stressed over shifts in perspective. But even while denouncing the revolutionary rhetoric, Hakken nevertheless speaks of cyborgs and cyberspace, implying that some significant shifts are, in fact, observable. New terms, when encountered in the field, are useful, for they

> provide rich labels for the practices anthropologists wish to investigate. Anthropologists take seriously the term "popular" among our natives (Hakken, 1999: 226).

Labels are not only taken seriously, they are also available in great abundance. Various disciplines and research groups stake out their claims to understanding the new technologies, and taxonomical proliferation adds considerable confusion to an already muddled field. Disciplines interested in researching the social context of computer networking include STS (defined alternately as science, technology, and society or as science and technology studies), SCOT (social construction of technology), NST (new sociology of technology), virtual ethnography, cyberspace anthropology, and many others. The studied field includes IT (information technology, information technologies, or Internet technologies), AIT (advanced information technologies), CMC (computer mediated communication), informatics (as used by Donna Haraway, 1991, and not as a slightly outdated term for information science), new technologies, or simply computerization. The terms are commonly capitalized, suggesting that their purpose is to serve as reusable labels rather than as one-off descriptions.

The picture is very much that of an unstable field, or perhaps of one still in the phase of its formation; there are many competing vocabularies, and no set definitions to refer to. It bears to note, though, that a similar confusion occurs in other fields of social science as well, though perhaps on a slightly lesser scale. Contemporary human social activity is studied, largely within the same settings and often using very similar frameworks, by anthropology, cultural studies, ethnology, organization science (or organization theory), social psychology, and quite a few other disciplines. The jumble can be made easier to understand if one considers the contemporary human being (the domains of both anthropology and psychology) as immersed in organized (hence organization science) social life that both shapes and is shaped by culture (studied by cultural studies and ethnology), but it still is not clear to what extent each discipline offers a distinct perspective on the researched phenomena, or if there is a difference in the phenomena studied. It makes more sense to assume reasons related to the institutional makeup of the

disciplines rather than the research matters—practitioners of different disciplines are interested in preserving their disciplines, faculties, and taxonomy. Accordingly, it is probably futile to expect taxonomical convergence in the studies of new technologies: there is simply not much to be gained in negotiating common nomenclature, especially as the different approaches remain mutually comprehensible.

The multitude of labels given to studied phenomena certainly attests to the large research interest in the social impact of new technologies. The scope and the focus of the resulting studies varies, ranging from global overviews of the networked society (e.g. Zuboff, 1988; Castells, 1996) to the examination of online communities (e.g. Rheingold, 1991; Rehn, 2001) to analyses of new forms of interaction (e.g. Turkle, 1995/7; Markham, 1998). One thing these very diverse studies have in common is the acknowledgement of the reorganization of spatiality within computerized settings. This point might, of course, be tangential to the researched phenomena, or even not be explicitly discussed by the author. Alf Rehn (2001), in a fascinating and insightful study of the gift economy of free (illegal) software distribution, i.e. warez, uses the name Warezonia to describe the object of his research, an online community engaged in the procuring, cracking and providing illegal programs to each other and the public at large. While Rehn explains that he is treating the Warezonians as an exotic tribe, and examines the use of the word "scene" to describe the Warezonian culture, he never deigns to explain why he chooses the geographical sounding name of Warezonia to describe the sociotechnical network that he analyses.

Manuel Castells, whose massive, three-volume study deals at length with the global spaces of capital and information flows, sees the changes in spatial arrangements as an inevitable consequence of any social change:

> Space is the expression of society. Since our societies are undergoing structural transformation, it is a reasonable hypothesis to suggest that new spatial forms and processes are currently emerging (Castells, 1996: 410).

The idea of the primal importance of space for the constitution of society is usually seen as originating from the work of Henri Lefebvre (1974), who postulated the study of space as a necessary foundation for understanding any society. Thomas Eriksen, shrinking from such generalizations, nevertheless describes spatial thinking as fundamental for at least the western way of conceptualizing the mind.

> The history of western (to accept that limitation) concepts of consciousness has been, exclusively, a history of metaphorical thinking in which spatial values have been attributed to minds. Whether you think of consciousness as a light (the *lumens naturae* of Cartesian philosophy or the sparkling light bulb of comic strips), a patriarchal helmsman or pilot (a metaphor dear to Renaissance poets and moralists alike), a mirror (or even a mirror-like *tabula rasa*) or, in the postmodern fashion, a nexus (a neural net, a computer web or the 'architecture' of a chip), your discourse will invoke spatial metaphors (Eriksen, 1995: 253).

Despite the widely acknowledged centrality of space for social interaction, the studies that examine the issue of spatiality tend to deal with it in a very restricted fashion—usually by limiting themselves to study of either online or physical surroundings, rather than developing a comprehensive analysis of spatiality. Thus, for example, when Steven Jones insists that

> community relies on what I previously referred to as "inhabitance," as being not just in the same place at the same time in interaction with others but as being *a part of* that place, as if one is a part of the landscape (Jones, 1997: 16),

he understands place and landscape as necessarily physical (that is, not virtual) phenomena. Consequently, in the comparison of a game of checkers played on a porch and the same game online, the latter comes out as deeply flawed. It is an attempt at restoring the feeling of a game played in a social setting, but

> this is an unsatisfying restoration because it is entirely made by us. There may be a game of checkers, there may be talking, but there is no porch, and thus there is no horizon, no landscape, no setting, no perspective (p. 32).

What Jones neglects is the simultaneous coexistence in both online and physical settings—the players may well sit on their own porches, embedded in the surrounding landscape, while at the same time using their laptops to participate in an online game. The perspective, the horizon, and the landscape might not be shared among players, but it does not remove their significance. At the same time, the act of sitting on one's porch does not invalidate participation in an online game.

This example is just an illustration of the shortcomings of a piecemeal approach to spatiality. Another, related issue concerns the body of the computer user. Regardless of the online interactions one is engaged in, the immediate physical surroundings still have to be dealt with. This includes paying attention to how comfortable the chair is, how much room there is for setting down one's notes and lunch, and how much does looking at the monitor screen tire one's eyes. As Annette Markham maintains, regardless of the network users' attitudes towards their bodies,

> their experiences still are located in the place where they live the most visceral parts of their lives, the body.... Everywhere I went online, I saw the body as a privileged site for experience. It is, after all, where we live as breathing organisms (Markham, 1998: 215).

Interestingly, Markham sees consciousness as located in the body, following a Cartesian mind/body split that will form a major theme in my analysis. For my research agenda is shaped by the lacunas in the presentations of space summarized above; I set out to study space as it is constructed in a computerized environment. This framing allows me to bypass the usual choice between researching cyberspace and physical space, and to treat them both as parts of a more general issue of spatiality.

It does not mean that I am ignoring the tensions inherent in subdividing human experience into easily separated spaces. As Bernward Joerges notes, the sociologist of technology

> generally celebrates 'aporia'—ambiguity, anarchy, contradiction, difference, discontinuity, discord, disparity, indeterminacy, irony, paradox, perversity, obscurity, opacity—in a word: chaos (Joerges, 1994: 101).

The tensions between various institutions provide the foremost means of examination and critique of the prevalent notions. In my case, the division between cyberspace and physical space serves as an entry point for an analysis of how space is constructed and maintained in computerized settings. For on the one hand, there is the unbridled freedom of movement evoked and promised by such expressions as *information superhighway, surfing the web,* or the everpresent *cyberspace,* clashing with the motionless body sitting in front of the computer. On the other, there is the embodied user sitting largely motionlessly and staring at the mostly two-dimensional text and graphics displayed on a flat (flatter with each new generation) monitor screen. Perhaps the most obviously spatial feature of the network as seen from that point are the kilometers of cabling connecting the networked computer, as well as, on a smaller scale, various peripherals (mouse, keyboard, printer) to each desktop computer. The two visions are not easy to reconcile, yet as the user participates in both at the same time, their interplay and interdependence are necessary to map out in order to understand the space, or spaces, constructed in a computerized (and networked) environment.

The discord between cyberspace and physical space, while it stands out as the driving force behind my analysis, is not the only anomaly, to borrow Thomas Kuhn's (1962/8) word, pointing me in the direction taken in this work. The discrepancy between the wondrous technologies promised to appear in the near future by the enthusiasts of rapid sociotechnological transformation and the buggy and often counterintuitive products actually offered at the moment is another. It is compounded by my own love of gadgets

coupled with a deep distrust of the discourse of social liberation through technological progress. Finally, there is the ultimate irony of my writing this thesis on an old, beat up laptop without an Internet connection simply because my newer, much more advanced computer (boasting broadband Internet access) distracted me with its many time-wasting lures whenever I attempted to use it for writing. To be fair, though, I need to admit to using the new computer for spell-checking and formatting the text, that is tasks requiring much less creative input on my side.

Structure of the work

In chapter two, I discuss the epistemological and methodological issues connected with my work. I situate my study in the social constructivist research tradition, and within the field of science and technology studies. I examine the implications of the Actor-Network Theory approach, and particularly the advocated casting of computers (as well as other non-humans) as social actors. I also explain my choice of the field material, the methodology used in its collection, as well as the choice of using science fiction literature and films to shine light on the context of the research.

Chapter three shifts towards a review of the available literature regarding the main concepts of my study, including academic texts as well as science fiction. I start by looking at the widely used, though nebulous idea of cyberspace. I examine the numerous conflicting or downright contradictory definitions used to describe it, approaching it as a useful, but not yet institutionalized concept; being still in the making is one of the reasons why it is so interesting. One characteristic common to many descriptions of cyberspace is its presentation as a venue for experience unmediated by the user's physical body, which is assumed to be left behind, before entering the virtual world. Another interesting strand of thought connects cyberspace and the mythic, or sees the former as an expression of spirituality—for example, Michael Benedikt (1991a) likens the possibilities offered by

computer worlds to the biblical New Jerusalem. These two themes come together in the presentation of a journey through the virtual realms as an out-of-body experience.

In the next section I move towards the flipside of cyberspace—the physical, or corporeal, space. Physicality, while excluded from the discourse of cyberspace, remains an important consideration in examining space around computers. It is worth stressing that I treat physical space as a social product, and not an outside factor that must be contended with. Thus, it is the construction of physical space around computers that I want to study, and the practices leading to the creation of contemporary spaces. The main point of the chapter deals with the distinction between place and space proposed by Yi-Fu Tuan (1977) and analogical to Giles Deleuze and Félix Guattari's concepts of deterritorialization and reterritorialization. In this typology, place represents the sedentary form arising from the need of security and rootedness, while space is characterized by mobility and nomadism, the expressions of the desire of freedom. Both converge in the form of the contemporary city, i.e. the physical site for most computerized environments. On the one hand, the city consists of highly immobile buildings and infrastructure, on the other, it is the locus of various flows—of people, goods, capital, and information (not to mention the often immense amounts of waste).

I treat the virtual space (cyberspace) and physical, or corporeal, space as separate entities because that is the way they tend to be treated in the Western culture. But the two are impossible to keep completely apart. Much like other seemingly impervious barriers, they need constant work to keep them segregated, and chapter five examines the notion of a boundary, with particular stress given to the apparent rift between the corporeal and the virtual spaces.

Chapter six deals with the human body, perhaps the most visible case of spatial separation, and instrumental to my research. The body has been posited in dichotomic opposition to

the mind already by Descartes; this separation formed the basis of the modern modes of ordering, and can still be found as an implicitly assumed distinction in many contexts. The same dichotomy is subsequently mapped onto the relations between humans and machines, with machines taking place of the supremely rational mind. A more careful analysis, however, reveals a complex web of relations that is made to appear as a rift between the two only through laborious reinforcing of perceived differences, as well as denying commonalities.

The next three chapters are based on my field study, each dealing with a distinct part of the study, based on different material and utilizing a different approach. The first part, described in chapter seven, comprised of analysing the discourse of Polish computer magazines, and examined spaces presented therein. It turns out that to speak of only two spaces, that is the virtual and the corporeal, would be to ignore the rather marked differences in the spaces appearing in the field. Namely, in the discourse of computer magazines, it is possible to discern a third space, which I call the technical space. The Cartesian dichotomy of body and mind is replaced by a tripartite model composed of the body (corporeal space), mind (technical space), and spirit (virtual space). Rational thoughts are separated from emotions and tied together with technology, whereas the emotions and imagination comprise the virtual worlds. While traces of the human body are present in all spaces, its physicality and messiness is actually excised from the corporeal and technical spaces—these are presented as sanitized and disciplined, while wild cyberspace contains the disorder and unruliness usually associated with human physicality.

The second part of the field study consisted of collecting and analyzing short stories based on full-page advertisements in computer magazines. These show a somewhat different ordering of space. Rather than as a collection of distinct spaces, the settings set out in these narratives are better organized on a plane described by two axes, one running from corporeal to virtual, the other from abstract to personal. But even the oppositions of

corporeal/virtual and abstract/personal turn out to be a convention, as exemplified by a story which manages to blend all the seemingly opposed qualities in a largely coherent (narrative-wise) setting. The stories are also notable for their treatment of the technical space, which is alluded to negatively in a few narratives, but is never used in describing the story's setting.

The final part of my field research is presented in chapter nine. It is a study of computer programmers, consisting of open interviews, direct observation, and shadowing. My interviewees almost uniformly deny the existence of cyberspace, at least as a factor in their daily experience. Space as such is also deemed irrelevant by many. That does not, of course, mean that discussion of space is irrelevant in regards to computerized environments, nor that space is not actively constructed by participants in such settings. Indeed, both interviews and observations provide numerous examples of how space is constructed, delineated, and used in various action nets and for various purposes—to mediate cooperation, establish groups and privacy, or delineate channels of communication. But no stable construction of separate spaces emerges from these practices, and none of the models considered so far comes close to ordering the variety of spaces created by computer programmers.

The final chapter reflects on the results of my study. It is obvious that in the end, I am left with no definite account of spaces in computerized environments. Three different approaches leave me with three different orderings, and none of them can be touted as the most accurate or the most complete. At the same time, the different viewpoints they represent allow for a more nuanced description than any one method would allow. What can be said, though, is that the boundary between the physical and the virtual cannot hold up to closer scrutiny. Discourses and practices routinely cross the very barriers they strive to enforce, or use spaces denied by the actors. Thus, instead of the rift, posited earlier, it is more useful to talk of interstices (to borrow yet another term from William Gibson). Rather

than a single boundary, there is a network of connections and differences that can be declared a barrier or a transition only through translation and interpretation.

Chapter 2: Methodology and theoretical considerations

Socially constructed reality

The title of this study already hints at my perspective in examining space around computers and computer networks. It follows Peter Berger and Thomas Luckmann's (1966/83) argument in *The social construction of reality*, that reality is never available for unmediated access.

> Because of this, and any attempt to make sense of it involves a hefty amount of interpretation as well as negotiating meanings with other social actors, whose actions and intents also, of course, need to be interpreted (Schütz, 1967).

How far the interpretation is grounded in any external reality is for some a hotly contested issue, and for others largely irrelevant. The latter position is taken by this study. Discussion on the limits of interpretation, while often highly entertaining (e.g. Eco, 1992), is possible only through abstracting the social work of sensemaking out of its context and imagining a situation in which various, highly social, constraints on the possible interpretations *could* be abandoned. Such speculation contributes little, if anything, to the task of understanding reality construction as an everyday chore, constantly repeated in circumstances where the range of acceptable meanings is limited. Precisely because it is impossible to test the limits of possible interpretation in any way other than (rather silly) thought experiments,[2] I tend to agree with Richard Rorty (1980/94) that the belief in the existence of an extrasocial reality is a matter of personal faith that can have no impact on research, the issue being experimentally undecidable.

[2]Umberto Eco (1992) mulls over the possible use of a screwdriver as an earwax-cleaning device, and Barbara Czarniawska (2003) reports a discussion on jumping from a high tower.

Actors: human and not

What is important, though, is that construction of reality, that is making the world intelligible, is a social process. Communication and organizing are central to establishing incontrovertible facts as well as to choosing one possible interpretation over another—as Steve Fuller maintains, all epistemology needs grounding in the social world.

> For even though the social world may appear to be a confusing place from which to deliver epistemic judgements—certainly more confusing than the privacy of one's study—it is nevertheless the *normal* (and probably the *only*) place in which such judgements are delivered (Fuller, 1988/91: 3)

If epistemology is to be regarded as rooted in the social world, the issue of delineating sociality assumes utmost importance. Here, a considerable amount of confusion centers on the question of what actors are involved in social processes. Traditional sociology sees only humans as full-fledged actors, relegating environment, tools, and institutions to the realm of objects or concepts, entering the social processes only through being acted upon. Yet the differences responsible for such a dichotomy tend to disappear when examined more closely. The so-called objects are capable of influencing other actors' (be they human or not) behaviour; their presence can also introduce complexity and uncertainty into the situation, much as the appearance of additional human actors. A microscope can play a decisive role in determining the existence of microbes, while operating procedures determine scientists' conduct in the laboratory. Because this approach undermines the division between the social and the technical realms, some researchers prefer the word "sociotechnical" (Law, 1991) or talk about constructivism without any qualifiers (Latour, forthcoming). As it is important for me to stress the interaction between various actors involved in constructing space, I prefer to talk of social actors, networks, and construction, while emphasizing that the "social" involves aspects often perceived as technical, material, or economic.

One difficulty stemming from the recognition of non-humans as social actors is that social interactions become very crowded scenes—the multitude of entities possible to discern becomes a serious problem for making sense of any social relation. For that reason, it is possible (and necessary) to treat groups and amalgams of various actors as singular entities, i.e. as actors in their own right. The most obvious example are organizations, but any grouping of human and non-human actors can be thus grouped together. On the other hand, N. Katherine Hayles (1999) argues for seeing humans as compound entities, consisting of a multitude of agents coordinated by a single consciousness. Of course, even everyday objects usually consist of numerous parts, as well as being imprinted with various standards, norms, and regulations (Joerges and Czarniawska, 1998). Actors can thus be seen as nodes in social networks or as complex social networks all by themselves.

Bruno Latour (1987) borrows Richard Whitley's (1972) use of the cybernetic metaphor of a black box to describe the possibilities of analyzing this conundrum. A black box is an instrument known only for its inputs and outputs, not its internal structure. Any social actor can be similarly viewed either as an integral whole playing some role in the social processes, or examined closely and seen as an amalgam of other social actors (who of course, can also be treated as black boxes or explored in depth). Dismantling black boxes is a time-consuming and difficult task, and it can be undertaken only to a certain extent and in regards to some of the actors. Much like the aeronautical black boxes—the flight data recorders (also named after the cybernetic concept), the social ones can be opened only in dire circumstances. As it is unfeasible (and impossible) to unravel any social network completely, one is forced to stop at some point, and examine only some actors closely, while treating others only cursorily. In my study, I concentrate on the spaces encountered around computers and, consequently, on unravelling their structure and the relationships in which they are constructed, while treating other actors as discrete entities. Yet I am conscious that the recognition of particular actors and not other possible ones is a choice

on my part, dictated by my research interests, rather than an inherent feature of the studied field.

There is another aspect of differentiating between various actors, largely ignored in the sociological theorizing. For while there is no significant difference between the human and non-human actors in terms of agency, there are some important variations in regards to communication—after all, the possibilities of my (that is a human actor's) communication even with a computer (a quite sophisticated non-human actor), although considerable, are rather limited when compared to my ability of communicating with other humans. This does not necessarily imply a hierarchy of escalating communication powers, only a variety of communication skills and abilities available to different actors. After all, the said computer is able to communicate with another computer, a printer, or a scanner in ways that remain beyond my capabilities.

Still, this variety structures both social practice and research prospects. As communication is central to social action, relations tend to be structured along its lines. François Cooren (1999) argues that processes of organizing, the basis of any concerted action, are structured directly through processes of communication. Organizing is seen here as the creation of collective agency, and thus of collective actors. As I have shown before, though, delineation of particular actors always depends on the interpreter's perspective and aims. For that reason,

> there are as many *organizational processes* as *actors.* Each structure or organization is nothing other than the *imposition of a description* that helps us make sense of the situation (Cooren, 1999: 189; original emphasis).

I would argue that there are as many processes as narrators, rather than actors, but the point remains that it is only through description, or interpretation, that any structure can take shape. Given the scope of possible differences between interpretations, it is not surprising that human actors tend to form the most important nodes in action networks

when looked at from their own perspective. This has an impact on any social research, for the latter needs to deal with the limitations of communication. Research relies on gathering information, insights, and reflections from the varied social actors, and this task is the easiest (and usually the most productive) when those actors are human, because of the broad possible range of communication. While there are some highly communicative non-human actors, most notably texts of various kinds (as well as videotapes and other recordings), none of them allow for as intensive interaction as the human actors. Not surprisingly, texts are widely recognized as being crucial for the construction of social life; Jacques Derrida's (1972) proclamation that there is nothing outside the text and Richard Harvey Brown's (1987) proposal to view society as a text can serve as testaments to the recognized importance of these non-human social actors. Computers, equipped with graphic user interfaces (GUI) and boasting whole new languages invented for communicating with them, are also very communicative non-human actors. No wonder, then, that Marie-Laure Ryan (2001) conflates texts and computers in presenting virtual reality as a model for contemporary and future narratives—in effect, merging the two highly communicative kinds of non-human actors.

The issue of attributing, or recognizing, the agency of non-human actors in social networks leads to some difficult considerations. Is this position akin to animism, wherein ghosts literally inhabit machines, and every object follows its own agenda? David Hess (1997) reports that Michel Callon, one of the staunch proponents of the recognition of non-human actors (1991), when confronted with this very question, explained that he never believed in any actual agency exhibited by the non-humans, only in its attribution (and thus bestowing) by the humans during social interaction. To me, such reservation is not necessary, and needlessly muddles the picture. Of course, agency is another social construct, but it is attributed as much to the human as to the non-human actors. Thus, it seems feasible to see the world as full of different actors, all deriving agency only from the

relations in which they are embedded. The ghost is indeed absent from the machine, but only because an actor does not need an animating spirit to become active, not from the lack of the machine's social activity.

The refusal to acknowledge a difference between humans and non-human actors is directly related to the principle of symmetry, a research guideline first advocated by the members of the strong program of the sociology of knowledge, most notably Barry Barnes (1974) and David Bloor (1976). The principle of symmetry states that all phenomena should be studied in the same way, without introducing an a priori judgement of their inherent differences. Its original application has been to allow for studying scientific knowledge without recourse to an extrasocial notion of truth, but it has since been extended to apply to any situation in which it is possible to use a common approach to various studied phenomena, even (or especially) if they appear to be inherently varied.

A stance that I adopt originates not only in the thought of my epistemological ancestors, but also in my unwillingness to treat the computer, the principal non-human actor in my study, as "just a tool." This rather dismissive expression appears very often in popular written and spoken discourse, but also in some academic sources (e.g. Bolter, 1984; Dent, 2001). Sherry Turkle (in Papageorge, 2003), long involved in ethnography of computer users, explains that the sheer popularity of that dismissal, coupled with apparent emotional engagement involved in interaction with the machines (most often, the derogatory phrase is accompanied by insights and comments indicating the computers' important and formative participation in any relation), singles out the interaction of humans and computers as an interesting research phenomenon. My own research (Kociatkiewicz, 1998) leads me to believe that the apparent put-down forms a means of asserting one's superiority and command over the intimidating and often recalcitrant non-human actor. Similarly, when Sherry Turkle (1991) acknowledges the tool metaphor, she goes on to ask if the computer is more like a hammer or a harpsichord. Her opinion sides with the latter—

i.e. an instrument of self-expression rather than a straightforward implement that every user should be expected to approach more or less the same way. Lucy Suchman (1987) proposed to view computers as interactive artifacts, capable of complex responses to the user. In other words, they resemble more of an articulate social actor, routinely entering complex relationships, than a simple prosthesis, strengthening and extending their users' abilities.

The lack of inherent differences between various actors does not imply they are indistinguishable, or interchangeable. Not only are they enmeshed in different social networks, but they are also treated differently by other actors. Although Steve Woolgar (1991) worries such treatment might simply be an expression of prejudice, it is definitely present and should not be ignored by the researcher. This, together with the communication advantages mentioned above, are the main reasons why my study is still focused on the human actors involved in constructing space. I am interested in the computerized environment as experienced by the human actors, and the anthropocentric perspective, much like the one assumed by the actors' themselves, allows me to get closer to their experiences.

Then again, my approach does not privilege all human actors over all non-human ones, but focuses on a specific group, that of computer users.[3] In doing this, I sidestep the criticisms levelled by Macgregor Wise (1997) against the research practices of Actor-Network Theory[4] scholars such as John Law or Bruno Latour, namely that their investigations are concerned with the system builders, the actors in power, and fail to address the marginalized, the oppressed, and the voiceless. Latour and Law's ethnographies are intent

[3]I am not concerned about how many human beings are actually computer users (increasingly large amount, to be sure). What matters to me is that I study these actors through their identity (or role) as computer users, rather than through any other identity that might be used in their social interactions.

[4]Actor-Network Theory, or ANT is a term popularized by John Law (1994),and commonly used to describe the approach similar to the one outline here. The name does carry its share of problems (Latour, 1999a), but is the most widely recognized one for this perspective.

on building their own hero narratives, and the actors who turn out not to be heroic are written out of the picture, claims Wise. Yet he also asserts that the problem lies not so much with the perspective as with the research interests of its proponents. My study concentrates on the end-users of computers,[5] a group not distinguished by any significant power. At the same time, though, all actors are endowed with the power of shaping reality. Psychologists subscribing to the Personal Construct Psychology school (Burr and Butt, 1992) insist that all actors ultimately define their own reality. Seen this way, all actors are heroic figures, and this is how they appear in my story—as active constructors of space around them; I view the computer users as self-possessed agents engaged in social processes. In Latour's terms, I black-box these actors, concentrating my attention on their activities of spatial construction, rather than on how agency comes to be attributed to them.

As I have already mentioned, my aim is to examine both the social interactions surrounding space construction and the users' experience of the processes involved. By experience, I understand not just a collection of sensory input, but a meaningful and expressible structure such data is arranged into. Kenneth Gergen (1994/7) argues that its form is invariably narrative, using a very broad definition of the narrative as any temporal embedding. Every event is conceptualized in some relation to the past and the future, and thus narrativized. Other researchers, like Yiannis Gabriel (2000), prefer to use the term narrative much more narrowly, as needing a clearly delineated plot. Seen this way, narrativity becomes only one of the possible forms of expressing experience; painting, music, and even some forms of writing, such as straight description, or a chronicle (White, 1980), are seen as non-narrative.

[5]Who, like the programmers described in chapter nine, can be also creators of software used by other end users.

The confusion is heightened by the debate on the narrative's ontological anchoring, much as in the case of the discussion on the existence of outside reality. Some, like David Carr (1986/91) see in it the deep structure of the only reality humans have access to, others, like Hayden White (1987/9), view it as an arbitrary (but ingrained in our culture) way of making comprehensible the chaotic jumble of events.

The resolution of the latter dilemma has no bearing on my research, but the decision of what counts as a narrative does. In the broad sense, all my research concerns narrativity, though in various forms ranging from advertisements to self-description to storytelling. In the narrowest sense of the term, my study still involves narratives, but not exclusively. Computer press advertisements rarely feature a plot, but they nevertheless help to define the spatial relationships in computerized spaces. Observation data and explanations received from computer users offers the most direct description of the examined spaces. But stories, be they in the form of science fiction or parables inspired by advertisements, offer not only the overt message easily delivered by other means. They

> also transmit *tacit knowledge:* they describe knowledge without analysing it, thus tapping on more than an explicit message characteristic for paradigmatic teaching (Guillet de Monthoux and Czarniawska, 1994: 9).

The form of this thesis also needs to be considered. On the one hand, it is written largely in accordance to the tenets of the academic genre, a convention aimed at eliminating, or at least occluding the narrative aspects of research. On the other, I am interested in presenting an interesting account of how the computerized spaces are constructed, and such an account can easily be called a story. This is another reason for complementing my analysis of the scientific literature with close reading of science fiction literature and film, considered as other stories of space and technology.

Research structure

The study consists of four complementary approaches towards the construction of spaces in computerized settings: close reading of science fiction literature on the subject, analysis of computer magazine discourse, collecting and examination of stories based on computer advertisements, and observation/shadowing in an IT company. The resulting variety can be called a combination of methodological and data triangulation (Konecki, 2000), even though the name implies using exactly three methods—I use different methods, and focus on different aspects of the studied field, to approach basically the same "problem," or rather just the same subject. Numerous authors (Silverman, 2000; Hammersley and Atkinson, 1995/2000) are quite sceptical of any triangulation in social research—while certainly an important part of the researcher's repertoire, it is likely to create just as many problems as benefits. Most notably, the assumption that the use of multiple methods automatically generates more accurate or insightful results is untenable—it is just as likely to lead to confused and unreliable analyses. The definition of the research subject is often the source of mistakes, as any vocabulary depends largely on context—it is difficult to specify exactly the same problem within different methodologies, and thus the researcher can end up attempting to conflate perspectives dealing each with a slightly different subject matter.

One aspect of using four different methods as well as varied material is that the results are not easily reducible to a single model or theory. For that reason, I do not try to unite the four approaches, but rather present them as largely separate, each providing a different view of the spaces constructed around computers. The examination of science fiction literature forms a preamble, while the three analyses engaging field material expand upon different aspects of the issues highlighted in the theoretical portions of the thesis, and cumulate to form a more nuanced understanding of these concepts. In the end, I am looking not for a single coherent perspective (and triangulation would indeed not help me

achieve one), but for a series of reconceptualizations that show locally constructed spaces, where the locality can be just as well understood to mean a single office as a single discourse. The first part of the study deals with the latter.

Fiction in social research

The use of fiction in social research has both a long tradition and many contemporary advocates. Thus, for example, Maria Ossowska (1956) used Daniel Defoe's *Robinson Crusoe* to examine bourgeois morality. Anthropologists since Malinowski and Mead have been using interpreting exotic cultures through their myths. More recently, Barbara Czarniawska and Pierre Guillet de Monthoux (1994) argued for considering novels as a source of insights into contemporary and historical organization and management practices. Nelson Phillips sees narrative fiction as both a valuable source of data and an important way of writing up social science research, and goes on to question the very distinction between a writer and a scientist, as

> social scientists often do what writers do: they create rather than discover, they focus on the unique and individual, they use illustration and rhetoric in an effort to make their case (Phillips, 1995: 626).

In order to benefit from the cultural richness of fiction and at the same time to anchor the research in the lived reality, Robert Hopper (1998) proposes using a mixture of fictional and factual accounts as study material. This is the approach I take in this work, complementing the close reading of science fiction narratives with a tripartite field study.

Science fiction

Science fiction, though often regarded as trashy literature lacking in artistic merit, has continued to enjoy considerable commercial and popular success ever since its beginnings somewhere in the nineteenth century (Aldiss, 1973), as a literary as well as cinematic form. It is not unreasonable to link its continuing success to the rapid development of

technology throughout the last two centuries, as the themes of science fiction often include reflections on the role of technological shifts in the organization of social life.

> The technological ramifications of these changes also imply a sense in which what it means to be human is also brought into question. SF has a long tradition of moralizing about a monstrous version of scientific rationalization that corrupts and destroys fragile humans (Parker et al, 1999: 581)

Conversely, science fiction also teems with technological utopias (or at least societies with a utopian relationship with technology), as integrating technology into both the setting and the plot remains the staple of science fiction. This fascination with the meeting between humans and advanced technologies is the prime reason for why I turned towards SF and not any other genre to look for insights regarding computerized spaces. Its significance is compounded by the reciprocity inherent in the relation—science fiction not only comments on existing or extrapolated technology, but can also be credited as an inspiration for technological development (Pohl, 1994). Such inspiration lies, however, not only (or even not primarily) in serving novel ideas, but also in providing myths for technological projects to draw on. The prototype space shuttle was named *The Enterprise,* after the spacefaring ship from *Star Trek,* the show also said to have inspired the development of cellular phones (Parker et al, 1999). Most notably in regards to the subject of this study, William Gibson's (1984) *Neuromancer* has been immensely influential in shaping both the popular images of computer networks as well as the direction of research regarding such networks. Accordingly, his work constitutes a major point of reference in my study. Not all ideas presented in science fiction are groundbreakingly new, of course, nor are their conceptualizations always particularly novel. But novelty is not a prerequisite of usefulness, and it is the widespread ideas that represent the dominant viewpoint. This is particularly noticeable in science fiction, priding itself on its appreciation of original settings while at the same time holding on to many contemporary institutions—the suspension of disbelief is never total, and is in fact always dependent on the assumptions

that some basic rules will not be called into question (Brooke-Rose, 1992). Science fiction is not any different in that regard, as Francis Spufford (1996/97) explains:

> Science fiction, by nature, offers both surprises and guaranteed pleasures. SF, no matter how good it is or how individual, tends always to hold out more specific and more predictable promises to the reader than fiction *per se.* To a much greater extent than the literary novel, it allows you to select the pleasures you plan to have in advance. This concentration, this extra single-mindedness, is what makes it the pre-eminent form in the culture for exploring ideas that are 'good to think' (p. 277/78).

While I disagree with separating science fiction from literary novel (though of course, novel is not the only form which science fiction takes) and certainly from "fiction *per se,"* Spufford's point about the interplay between genre constraints and creativity is certainly valid. But while formal and literary innovation in science fiction narratives is limited, there is much freedom and variation in depicting the subject most interesting in regards to my study—the meeting point between humans and new technologies. Bruce Sterling, another noted science fiction author, glorifies this possibility in presenting the genre as the holy fool, or the wise court jester:

> If poets are the unacknowledged legislators of the world, science fiction writers are its court jesters. We are Wise Fools who can leap, caper, utter prophecies and scratch ourselves in public. We can play with Big Ideas because the garish motley of our pulp origins makes us seem harmless (Sterling, 1995: 9).

A brief note is needed here on the delineation of the genre I use for the purposes of its study. There is no single coherent definition available, and I shall not attempt to procure one myself. This would be particularly difficult if I tried to extricate science fiction from its sister genres of the fantastic: fantasy and horror. While it is possible to make the separation in principle, e.g. based on the idea that science fiction settings do not suspend or break the laws governing reality as known at the time of writing, such definitions invariably fail when confronted with real works and authors. Additionally, a sociological separation of the

authors or readers of each genre is similarly unfeasible, as both the readers and the writers of all genres of the fantastic intermingle freely.

Accordingly, while I concentrate on the works unambiguously coded as science fiction (by the authors, publishers, or critics), I also turn to the related genres whenever it seems they might provide me with additional insights into the researched ideas. Moreover, the only sub-genre of science fiction I single out is cyberpunk, the most relevant for my study subject. Even then, I use the designation loosely, and do not even attempt to come up with its definition.

The mostly literary movement known as cyberpunk (although some films can also be classified as belonging to that category, most notably *Blade Runner* and *Matrix*), whose members include William Gibson and Bruce Sterling, came to light in the early 1980s, and has remained as one of the recognizable sub-genre of science fiction. The most important innovation of cyberpunk was to anchor the work's reality in the props of contemporary everyday life. These props include pop-cultural icons as well as the ever-present and increasingly sophisticated consumer-grade technology. Unlike in most preceding science fiction, the technology of cyberpunk worlds does not exist in isolation from its social context, but is presented as completely enmeshed in advertising, economics, and popular culture.

> [C]yberpunk authors constructed works that moved seamlessly through the realms of hard science and pop culture, realms that included chaos theory and Madonna, dada and punk rock, MTV and *film noire,* Arthur Rimbaud and Lour Reed, Arnold Schwarzenegger and Oliver North, instant reruns and AI (McCaffery, 1991a: 12-13).

Such stylistic developments undoubtedly contributed to the cyberpunk's critical and marketing success, but do not by themselves mark it as an important genre for my analysis, even if the grounding in the current cultural context singles the genre out as

useful for providing tacit knowledge on some aspects of the contemporary culture. What sets it apart in regards to my study, however, is that "[c]yberpunk presents visions of the future based on the extensive application of the word cyberspace" (Cavallaro, 2000: 14).

In other words, together with its predecessors, most notably William Burroughs (1964/92) and J.G. Ballard (1969/2001), the cyberpunk genre offers the first accomplished intimations of living in a networked, computerized society. As such, it is an invaluable source of insights and propositions about the spaces such environment might engender and promote.

Cyberpunk is largely regarded as a 1980s phenomenon, and the question might arise if it really can be helpful in terms of making sense of the impact of the so-called new technologies (Kember, 1998; Colucci, 2002), many of which appeared and became popular only throughout the 1990s and 2000s? After all, not only wide area networks were largely confined to research and military applications at the time the bulk of the cyberpunk canon was written, but also the then cutting edge technology used in these systems did not come even close to duplicating the effects envisioned in cyberpunk novels; in fact, even today's computers are far from achieving most of these results.

The answer lies not only in the cyberpunk works themselves, but also in the possible ways of reading them. It depends on the assumed relation between the work of fiction and its surrounding social reality. Slusser et al. (1983) extolled the virtues of examining such a link, and although the thrust of their argument has been towards using the context of the work to inform the critical analysis of fiction, the converse also applies: works of fiction can be used as a means of analysing social phenomena. The possible utility of such analysis is tied to how the issue of interpretation is approached by the researcher. The two most popular theories of interpretation call either for anchoring the analysis in the context of the work's creation, or for examining its relevance in the contemporary setting; they

corresponds largely to seeking what Umberto Eco (1979) calls *intentio autoris*, that is the author's intent, and *intentio lectoris*, the intent of the reader.[6] In the former case, the researcher/critic strives to recapture the original milieu of the analyzed fiction, or its message as envisioned by the author (most theological Bible studies fall into that category). In this vein, Sandra Gilbert (1983) examines the nineteenth century gender relations through H. Rider Haggard's *She,* and H. Bruce Franklin (1983) sees the American hopes and dreams (as well as some cautionary voices) of 1939 reflected and crystallized in the science fiction fantasies of the period.

In the other approach, the researcher aligns him- or herself with the reader rather than the author. The aim is to discover correspondences between the analyzed work and issues current for the researcher. This is the easiest (and probably most fruitful) with non-realist and non-mimetic fiction, which eschews strong links to the author's milieu, or when the temporal distance between the author and the critic is not overly large. Fairy tales, thus, lend themselves very well to such examination (cf. Bettelheim, 1975/85), as do narratives of alternate history (Warf, 2002), which thrive on disrupting established chronology.

Science fiction that does not deal with reworked history presents a bigger problem—on the one hand, it is non-realist and non-mimetic, on the other, it often strives to remain abreast with the current scientific and technological developments (Kitchin and Kneale, 2002). The desire to follow either the technical groundings or broader and less specific concepts should thus influence the critic's choice of an author- or reader-centered analysis, as should the chosen timeframe—studies concentrating on the contemporary situation have little to gain by charting the changes in the genre throughout the years.

[6]Eco's work highlights the third interpretation, that of *intentio operis,* that is the intent of the work. But it seems the concept, located inbetween the author and the reader, would take different forms if approached historically and ahistorically, and is thus not useful for the distinction I am making here.

My own study tends towards reader-oriented approach, as I have no interest in the context of creation of the works I analyze, nor in their original relevance; I am interested in the spaces constructed in computerized environment here and now, that is in Poland in the early 2000s. Thus, I don't treat science fiction films and literature as evaluating the state of affairs perceived by their authors, but as an exploratory genre that can provide fresh insights into the possibilities of conceptualizing computerized spaces. For that reason, I am not concerned about the sources of inspiration which helped science fiction authors in realizing their vision, or about these authors' familiarity with the technical details they described. For example, William Gibson is said to have written *Neuromancer,* the most influential novel in terms of shaping the cultural images of computer networks, while having next to no knowledge of computers:

> When I was writing *Neuromancer,* it was wonderful to be able to tie a lot of these interests into the computer metaphor. It wasn't until I could finally afford a computer of my own that I found out there's a drive mechanism inside—this little thing that spins around. I'd been expecting an exotic crystalline thing, a cyberspace deck or something, and what I got was a little piece of a Victorian engine that made noises like a scratchy old record player (William Gibson in McCaffery, 1991b: 270).

It is, of course, impossible to tell what *Neuromancer* would have been like if Gibson had known more about computers at the time of its writing. It could have been more, less, or just as influential—Gibson himself claims he wouldn't have been able to romanticize computers that much, but it is only his guess. The main point is that the knowledge was not necessary to write an enormously important novel, much as it is not necessary in order for such works to be interpreted in the light of the developments in available technologies. Accordingly, the development of new technologies does not invalidate cyberpunk's relevance for analysing the construction of computerized space, as the latter depends on the very relation between actors and technology that are explored in cyberpunk fiction.

Another testament to cyberpunk themes and aesthetics' continuing applicability to contemporary cultural situation is its the genre's sustained popularity, evident e.g. in the success of 1999 film *Matrix,* which retained much of the cyberpunk subject matter (the meeting between humanity and technology, taken there much more literally than in most novels) and style, while updating the available technology.[7]

Though I ignore most of the historical details of the analyzed works' creation, I am not completely oblivious to the changes undergone by science fiction throughout its history, and I do take note of some of the important trends (such as the emergence of cyberpunk, or the move away from exploration of space as the staple theme of science fiction). In a few cases periodization does offer obvious clues for interpreting the notions appearing in the work (such as Edgar Rice Burroughs' science fiction, written and published alongside adventure stories in the pulp era of the early twentieth century), and I include such pointers in my analysis. Mostly, though, I consciously avoid the extranarrative influences on the world described in the work, concentrating rather on the reasons and explanations stemming from within the presented setting.

The foremost aim of my review of fiction and academic literature is to provide background for further analysis of the computerized spaces. This background includes examination of the main concepts of my study, the most basic of which are cyberspace and physical space. In those explorations I do not seek final definitions of these notions, but rather starting points that can be used as a basis for pursuing further interpretations. I start from the popular and established notions, engaging the multiplicity of their meanings and contradictions. By highlighting these tensions, I am able to examine issues that are usually just shrugged off in much the same way as computers are dismissed as "just a tool." In

[7]The late 1990s explosion in mobile telephony is reflected by the foreground role played by phones in the film; together with computers they form gateways between corporeal reality and cyberspace. In a way, this updates and reworks Jeremy Stein's (1999) description of the phone network as a precursor to contemporary virtual spaces.

Deleuze and Guattari's (1980/8) terms, I welcome the lines of flight, that is the possibilities of reflecting on, and perhaps exploding, even the most entrenched institutions. The field study part of my research is dedicated to just such a task.

Magazine discourse

I begin the field research part of this thesis by examining the discourse on space present in Polish computer press. The study involves an analysis of 88 total issues of 7 different monthly computer magazines. Three of these (by far the most popular ones) were studied across a two and a half year span (from January 1998 to May 2000), one (the most enthusiastic towards the computer as a culture-changing medium) during the whole 1998 (I have been unable to locate any issues from 1999 or later, so that magazine might have gone out of business), and single issue each of three more magazines.

Method-wise, I turn towards cultural studies, and draw upon the techniques of the variously named textual analysis (Denzin, 1992) or cultural analysis (Kostera, 2003) to show how and what spaces are presented in the magazine discourse. This is the most abstract part of the field study—not only do I examine a quite general discourse, aimed at a wide audience (*PC World: Komputer,* one of the magazines, boasted an edition size of 140,000 copies in 1998). In my analysis, concentrate on both pictures and photographs in the magazine as well as the text, looking for language and images that could be associated with spatiality. The images include advertisements (which I also use for the second part of the study) and illustrations accompanying various articles. In my analysis, I start out with concepts brought in from the theoretical section of this study, I also look at the changes and reinterpretations necessary to reflect the computerized spaces as presented in the magazines.

Short stories

The second part of my field research sees a return to the narrowly defined narratives, for there I examine stories inspired by computer magazine full-page advertisements. It also lies midway on the trajectory from the rather abstract spaces of the magazine discourse towards the personal spaces of IT specialists' work lives analysed in the third part of the field research.

Story collection is a technique employed to examine the use of such concepts as power (Czarniawska and Kranas, 1990), gender (Czarniawska and Calás, 1998), spirituality (Kostera, 2001), and control (Kostera, 2002). The technique involves eliciting short stories on a given topic from a number of study participants. The actual ways of asking for a response can vary widely—in the studies cited above it ranged from giving a topic to providing a beginning of the story the participants are then supposed to finish, or simply asking for impressions and interpretations of a prewritten story.

The technique can be very effective for fleshing out vague, but well-known (at least to the researched) concepts, much as the list of topics provided above suggests. My own preoccupation with spaces fits that very well, yet I felt I needed to create stronger ties between the stories and computerized spaces. I also did not want to give any more input from myself, having already presented my interpretations in the first part of the field study. I came up with the idea of using full-page advertisements as the focus of the story for the participants. They were informed that the ads came from computer magazines, and that I was interested in studying space in computerized environments. They were then asked to see the illustrations (one per story) as pictures they found in a novel they haven't yet read, and then come up with a synopsis of the said novel—in other words, to summarize a novel that could have such a card for an illustration.

The study participants were mostly students of management, all of them computer literate. They were chosen not only for the ease of access, but also because they tended to represent a position neither within nor outside the world of computers. They formed yet another middle link between my outsider perspective used in the analysis of magazine discourse, and the programmers presented in the third part of field research.

All in all, I collected almost 60 stories which I analyze in chapter seven, following much of the same techniques like the ones I used for the computer magazines. I also draw upon Yiannis Gabriel's (2000) research on organizational storytelling for additional insights into the short, ad hoc narrative forms.

Shadowing and observation

In the last part of the field study, I actually entered the constructed spaces, in the course of non-participant observation and shadowing, complemented by interviews. Shadowing (Czarniawska, 1998; Kostera, 2003) is a technique in which the researcher follows the observed subject throughout his or her work day, trying to get a relatively complete sense of the setting of that person's work, and the social processes it involves. Obviously, this is done only with the research subject's full agreement.

I received the permission to shadow a programmer working in a company producing custom databases, mostly for corporate clients. Because that person's work turned out to be not only stationary, but also carried out in a room occupied by other people as well, I was able to combine shadowing with observing those people. While I was up front about my interest in the whole organization, my primary identity at the company was of a person shadowing the one programmer. This proved quite beneficial for my study, as the other IT specialists did not feel under scrutiny and found it rather easy to ignore me. The person I shadowed seemed somewhat more constrained by my presence, at least initially. He had known me from before the study, though, which I think made him less self-conscious about

being constantly watched. Nevertheless, shadowing is emotionally draining to both the observed and the observer.

Observation and shadowing were complemented by eleven open, unstructured interviews with various programmers, eight of which were also employees of the company in which I conducted observations. Whereas interviews tend to be used simply because they are the default qualitative research method (Silverman, 1998), my own choice was dictated by the subject of my study. I wished not only to see the practices of space construction (for which the shadowing and observation were the best methods), but also to learn of the sensemaking and reasoning involved in such construction. Only interviews could provide me with insights into that.

Writing

Finally, I would like to add a note about my own use of rhetoric and style in constructing this thesis. Obviously, I place it within the academic genre, and try to maintain most of the conventions regarding such writing, while attempting not to fall into the common trap of ponderous and cumbersome proclamations (Golden-Biddle and Locke, 1997). At the same time, I am also interested in preserving the words and language of those I met in the field, as well as presenting as much field material as possible, giving the reader a possibility of checking at least some of my interpretations. The parts of this work dealing with fieldwork are thus interlaced with interview quotes, as well as with scans of analyzed images. The latter also provide an aesthetic addition to this work, breaking the monotony of the text.

In the end, I just hope that my style choices help me to tell the story assembled through my research, the story of various spaces and their volatile boundaries centering on networked computers.

Chapter 3: Cyberspace: the world beyond

Computers and computer networks are quite often described in spatial terms. This is evidenced not only in the notion of cyberspace, but also in metaphors and expressions such as “surfing the net,” or “travelling the information superhighway.” Regardless of whether one treats it as an actual space or as a metaphor, spatiality is firmly present in the discourse of computers.

Space and time

Perhaps computers are not unique in this respect. Organization theorist Richard Boland pointed out with disdain the primacy of space in conceptualizing thought, claiming that it fails to account for the narrative structure of human thought, irreducible to any spatial structure or metaphor (2001). Conversely, Michel Foucault (1967/86) described historicity as the preferred mode of nineteenth century thought, and predicted the rise of spatial thinking, alone capable of doing justice to the contemporary modes of life.

I believe that the opposition between spatiality and narrativity is misleading, and the acknowledgement of temporality and storytelling as constitutive to our experience does not need to lead to negation of space, or even to diminishing its importance. But for narration to coexist with spatiality, the embodied, unruly humans inhabiting spaces of experience need to be acknowledged, instead of concentrating solely on the conceptual space filled with idealized models and concepts. This consideration is, as I shall demonstrate, quite often ignored in the discourse of cyberspace, leading to a gaping rift between the utopian hype and users’ experiences. This, though, is not the only gaping rift that I will have to contend with in this study—the other one, the abyss between the physical and the virtual space, is probably even more important here. But before I turn to examine this rift, I want to take a look at the spaces perceived on both sides of this divide. Of these, one is often termed cyberspace, or virtual reality.

Definitions of cyberspace

Delimiting meanings of the concept of cyberspace is a very problematic endeavour, as it has increasingly

> become a catch-all term for everything from e-mail to GameBoy cartridges, as though each computer screen were a portal to a shadow universe of infinite, electronically accessible, space (Markley, 1994: 434).

This wide an understanding of the term is obviously important for realizing the cultural importance of the idea, but it is hardly useful for understanding anything more than its all-pervasiveness. A more restrictive definition, proposed by Michael Benedikt, sees cyberspace as "a globally networked computer-sustained, computer-accessed, and computer-generated, multidimensional, artificial, or 'virtual' reality" (1991b: 122). Warren Smith distinguishes between virtual reality, understood as computer systems striving to provide a complete sensory experience to their users, and cyberspace, a more general term for "digital experiences—for example, interacting through e-mail or navigating the internet" (Smith, 1998: 233). Otto Imken (1999), on the other hand, sees in cyberspace only a small graphical subset of the global computer network which he dubs the Matrix. Mike Featherstone goes in the opposite direction, and equates cyberspace with computer mediated communication, defining both as:

> a cluster of different technologies, some familiar, some only recently available, some being developed and some still fictional, all of which have in common the ability to simulate environments within which humans can interact (1995: 5).

He then proceeds to enumerate three different kinds of cyberspace, one of which happens to be the virtual reality. In yet another twist, Mark Stefik (1996) sees in cyberspace just one of a number of metaphors used to conceptualize the Internet, the metaphor of Digital Worlds. The other possible imaginings of the Internet examined by Stefik are the Digital Library, the Electronic Mail, and the Electronic Marketplace. Additionally, he uses the term

Information Superhighway (or I-way) as a synonym for the Internet. Understood this way, the concept of cyberspace is limited to "just" the Internet, and does not include any computer networks or virtual realities unconnected to that global net.

Clearly, no single ordering scheme has so far prevailed, and the tags "virtual reality" and particularly "cyberspace" are arbitrarily assigned to variously sized subsets of the field of computer mediated communication, that is computer networks and their use as a whole. Rather than adopting one of the conflicting academic definitions or imposing my own definitions and thus staking out my field of study (excluding understandings falling outside this delimitation), I shall instead accept the broadest possible definition of cyberspace and virtual reality (treating them as synonyms), and look for possible understandings of these spaces as presented in literary discourse and science fiction films. It may seem strange that much of my attention remains on printed media when cyberspace is often seen as their nemesis, supplanting and replacing print culture. Yet Robert Markley (1994) astutely notes that cyberspace is itself very much a product of literary works—it has been popularized and brought to capture popular imagination mostly through printed matter—cyberpunk fiction, magazine articles, and academic publications. It is cyberpunk that constitutes the direct link between virtual reality and science fiction, but the connection between the two goes much farther than just this subgenre. Additionally, the most common tool for communicating with computers is the keyboard, and much of the data supplied by computers remains in written form. And it is not just *cyber*space that I shall need to consider, for other spaces surrounding or containing computers also fall within the domain of my research.

Science fiction spaces

Throughout the last few decades, an important shift has occurred in science fiction's treatment of space. In older stories, the space of science fiction was invariably the outer

space, and technological progress was synonymous with devising means for interplanetary or interstellar travel. Indeed, Robert Heinlein, one of the most prominent SF writers in the forties and fifties has been credited with formulating the so-called "future history," a set of guidelines of what the future of humankind should look like (Gunn, 1979/87). Humanity was expected to find means for leaving Earth and, soon afterwards, the solar system. The Moon, as well as nearby planets were to be colonized, followed by expansion towards other stars and the rise of a galactic empire. These hypotheses served as a backdrop for the majority of SF stories of the period, which does not mean that all these stories shared the same milieu—SF always invited alternative futures. But different futures were regarded as less fortunate for humankind, as deviations from the "right" path delineated by the "future history." This attitude coexisted nicely, fed upon, and fostered the space race crowned by the Moon landing in 1969. From today's perspective, (hu)mankind's giant leap seems somewhat premature, followed as it was by a hasty withdrawal from the Moon and a stalling in space exploration. Some work continues to be done on this front (the International Space Station being the most visible project), but the enthusiasm and funding surrounding Yuri Gagarin, John Glenn, and Neil Armstrong was never recaptured. The recent crash of the Columbia space shuttle seems to have served to further curb the public interest in developing the space program. Science fiction proved not much more loyal to the vision of the journey towards the stars than the rest of the populace, and proceeded to find other space suitable for exploration. Indeed, the year 1969 was particularly significant, in that it also saw the beginnings of ARPANET, a protoplast of the current champion of cyberspace, the Internet. But the idea of cyberspace (as well as the word) did not appear until 10 years later, with the emergence of the cyberpunk movement, which culminated in the publication of William Gibson's seminal novel *Neuromancer* in 1984.

Prelude to cyberspace

Before I turn to analyzing the visions of cyberpunk discourse, though, I would like to examine some of the ideas and assumptions behind the idea of cyberspace. As I have already mentioned, human thought tends to be conceptualized as a spatial concept. Robert Rawdon Wilson further elaborates on this point:

> The history of western (to accept that limitation) concepts of consciousness has been, exclusively, a history of metaphorical thinking in which spatial values have been attributed to minds. Whether you think of consciousness as a light (the *lumens naturae of* Cartesian philosophy or the sparkling light bulb of comic strips), a patriarchal helmsman or pilot (a metaphor dear to Renaissance poets and moralists alike), a mirror (or even a mirror-like *tabula rasa*) or, in the postmodern fashion, a nexus (a neural net, a computer web or the "architecture" of a chip), your discourse will invoke spatial metaphors (1995: 253).

Computers, which have long been anthropomorphised as thinking machines (Prasad, 1995), have naturally inherited a deeply spatial mode of discourse. What is important here in connection to the vast majority of computer related discourse is its particular understanding of the spatiality of thinking.

Sherry Turkle (1995/7) coined a wonderful phrase to describe how environment features in the way human beings tend to think—they use "objects to think with," which are manipulated both physically and mentally, and form a powerful device for enhancing our ability to come up with new ideas and solutions to problems. Indeed, the objects need not be all material—toying with concepts and metaphors also constitutes a way of thinking with objects. But it is important to note that there is no inherent difference between playing with an idea and with a piece of paper—both can be used in a very similar way as a component of the thinking process. Antonio Strati (1999) developed similar ideas under the concept of organizational aesthetics, stressing the importance of tacit knowledge, of

hands-on experience, of skills and abilities that cannot be thought of in a way different and separate from actually doing them.

The idea of tacit and embodied knowledge seems to be missing from the cyberspace discourse. But to understand how and why it got excluded, one needs to take a look at the roots of the whole metaphor of cyberspace, which is, after all, a way of thinking of computer networks in spatial terms. As was to be expected, there are several genealogies of the term. In one of them, Frank Davis (1998), presents cyberspace as originating from the concept of a forest of thought, introduced in middle ages by a Catalonian scholar, Ramon Lull. This forest constituted a schema for ordering and cataloguing entirety of knowledge, represented as leaves and trees in an imagined wood. Now let us compare it to another description:

> Cyberspace is a completely spatialized visualisation of all information in global information processing systems, along pathways provided by present and future communications networks (Novak, 1991).

The two visions are so close together as to warrant being considered identical, which prompts us to closer examine the concept of mind-space and characteristics thereof. Jorge Luis Borges gives perhaps its finest visualization in a short story entitled "The Library of Babel," the roots of which can be traced back to Ramon Lull's writings (Gunn, 1982/88). Writes Borges:

> The universe (which others call the Library) is composed of an indefinite, perhaps infinite number of hexagonal galleries. In the center of each gallery is a ventilation shaft, bounded by a low railing. From any hexagon one can see the floors above and below—one after another, endlessly. The arrangement of the galleries is always the same: Twenty bookshelves, five to each side, line four of the hexagon's six sides (1941/99: 112).

The Library is indeed global; in fact, it is literally universal. The world Borges depicts is constituted by and obsessed with information; the information itself is largely nonsensical,

as it consists of every possible book, without preference as to quality, relevance, meaning, or style. It comes as no surprise that cyberspace is often conceived of in terms reminiscent of the Babel library—as an ultimate (and ultimately useless) database, filled indiscriminately with valuable and worthless information, offering no reliable ways of sorting one from the other.

Borges' vision is characteristic in yet another way—his library, although inhabited by embodied humans, is a place of purely intellectual pursuits. Bodily needs are attended to through the use of "two tiny compartments. One is for sleeping, upright; the other, for satisfying one's physical necessities" (ibid.: 112), but they comprise a mere distraction from the pursuit of knowledge contained in the books. Physical conflict occurred (up to and including murder), but its source lay invariably in the interpretation of the books filling the Library. Emotions did not play a large part in the characters' lives, which were driven instead by intellectual disputes and scholarly disagreements. This preoccupation with "pure" information, unburdened by its physical manifestation, is yet another similarity between Borges' vision and the discourse of cyberspace.

Here, if I am to retain the earlier metaphor of the forest of thought, I need to reconceptualize and narrow down this vision somewhat. The forest is not a tangled mess of leaves, trunks, and branches, filled with smells of earth and decaying leaves, pierced by an occasional rustle or bird-cry; rather, it is a veritable Versailles of information, where no bush stands out of place, no branch bends the wrong way, and indeed—all leaves are firmly attached to the appropriate plants. This does not need to imply that the ordering is particularly thoughtful, only that it is carried in a very orderly way. Borges' story still serves here as a remarkable parallel—in the Library of Babel, the spatial ordering of books is impeccable. It is the organization of their content that remains, utterly chaotic. It is worth noting that, as usual, Borges' story draws from the author's experience of working as a librarian as well as from his considerable imagination—in an afterword to *Aleph,* he

mentioned a book classification system based upon "a code I have entirely forgotten save for the detail that God can be found under the number 231" (1949/99: 288).

God is indeed quite at home in a complete ordering carried out in accordance to some inscrutable and incomprehensible rules, and cyberspace forms the contemporary soul-space, claims Margaret Wertheim (1999). She also provides a different genealogy from Davis', seeing the first roots of the cyberspace in the mystical visions of afterlife. Michael Benedikt (1991a) seconds her in finding spirituality in the digital spaces, and equates cyberspace with New Jerusalem, the Heavenly City. Its defining characteristics include

> weightlessness, radiance, numerological complexity, palaces upon palaces, peace and harmony through rule by the good and wise, utter cleanliness, transcendence of nature and of crude beginnings, the availability of all things pleasurable and cultured (p. 15).

Unlike the science fiction visions presented below, Bendedikt's cyberspace offers neither bodily participation nor compensation for the lacks and shortcomings of bodily space. Instead, this vision forsakes hopes of bodily ascension and prepares us for entering the Heavenly City with our souls alone. This, actually, provides a common point to Wertheim's and Davis' origin stories for the idea of cyberspace; whether regarded as a shelter for the mind or for the soul, virtual reality has apparently nothing to do with the human body; the spaces of mind and of soul are unified in their denial of the earthly body, the denial which plays a prominent role in the discourse of cyberspace.

But it should be remembered that Borges' need not be the only interpretation of the world-spanning library; Terry Pratchett (1992/3) posits an obvious derivative of the Babel Library in his *Discworld* series—a magical L-space connecting all the libraries across time and space. His image is however, anything but sterile—not only the Librarian in the form of an orangutan keeps swinging through the bookshelves, but the magical books have the life of themselves, ready to snare the unwary passer-by. And of course, there is the issue of

medieval libraries and reading rooms having been full of din and racket, as reading was a noisy and social activity.

Cyberspace proper

Vernor Vinge's (1981/7) novella *True names* is usually credited as the first appearance of the concept of cyberspace in its fully articulated form, although the most often quoted definition comes from *Neuromancer.* The novel chronicles a group of shady characters' attempt to free an AI (artificial intelligence) from corporate control. In the tradition of caper novels, these protagonists are hired by a mysterious mover who stays out of limelight. In a science fiction twist, this organizer turns out to be another AI. Both the words cyberspace and matrix are used in the novel (though the former much more often), and that space is described as "consensual hallucination" (Gibson, 1984: 51); the phrase has been endlessly repeated ever since. Nevertheless, while it conveys the image of psychedelic lights and inhuman forms available to multiple users from around the world, it does not begin to express the range of meanings ascribed to the matrix in Gibson's writings. First of all, it is a glittering space full of clandestine data, a universe far removed from the unpleasantries of the body. It was thus ironic (and the irony seems intended by the author) that certain bodily requirements were needed to access it, and Case, the main character, despaired because a nerve-crippling injury kept him from this disembodied paradise.

The biblical parallels with the banishment from Eden are obviously in order, and indeed, in Gibson's subsequent books set in the same setting as *Neuromancer* (*Count Zero,* 1987 and *Mona Lisa overdrive,* 1988), the matrix becomes increasingly presented as a mystical entity. The mysticism easily overshadows its early description as a hallucination. In *Neuromancer,* it is hinted that extraterrestrial entities can be contacted through cyberspace. In later novels, artificial intelligences of the matrix become voodoo gods, *loas,* who roam cyberspace in pursuit of their inscrutable goals. James Kneale (1999) provides

an interesting reading of *loas* as AIs' representations misconstrued by people who fail to understand the net, but as even the most knowledgeable characters in the novels seem to perceive the matrix as a mystic and mysterious experience, I find this interpretation less than convincing. Gibson's is not the only mystical reading of the cyberspace; other authors have also interpreted its imagination-gripping force as an indication of its mythic quality. Agnieszka Myszala argues that

> the voodoo religion [in the matrix - JK] seems to fill the spiritual vacuum generated by the disappearance of God and sacrum from the human everyday urban existence (1998: 98).

The mythic themes appear even more strongly in Marge Piercy's feminist cyberpunk novel *Body of Glass*[8] (1991/2). The book retells the story of the Prague golem in a science-fictional, postapocalyptic setting; Jewish women of three generations take care of, and nurture a synthetic being created by a male scientist to protect a Jewish settlement. The novel can be read as a commentary on patriarchic social relations, as a recasting of Jewish mysticism for a technological setting, but also as a presentation of cyberspace as a make-believe world where will and imagination shape reality. It is the latter reading that is the most relevant for my study. The virtual space of the novel remains realist: characters remain human beings (though they can shift their shapes if the situation demands it), secret entrances are disguised as waste dumps, and distances are measured in kilometers, even as one character observes, "[r]emember, space isn't real here" (p. 363). It is a virtual reality of empowered human subjects who enact their fantasies while retaining their identities, much unlike Gibson's characters reduced to disembodied points of view traversing unreal space. The mystical aspects of the make-believe world of Piercy's cyberspace are reinforced by ritual purification undergone before entering the Net:

[8] Published in the U.K. as *He, she, it.*

> Now Malkah removed the two small garnet [earrings] and placed them like red eyes before her. She washed her hands together in her lap, another gesture Shira had often noticed in others about to connect. Shira herself always sat very still before connecting. She had been taught the common disciplines to quiet her mind before projection (p. 524).

In cyberspace, characters' actions become aligned to mythic themes—overcoming obstacles through imaginative shapeshifting replays an ancient Indo-European myth of the wizards' (or gods') duel, in which antagonists alternated in assuming powerful forms, suitable for besting the current shape of the opponent (Kempiński, 1993). It has to be noted that *Body of Glass*, in its re-examination of Jewish mysticism, is all riddled with mythic references, and cyberspace offers only an intensification of this element, rather than introducing it into a world normally devoid of mythic qualities. At the same time, this intensification is significant enough to warrant the description of Piercy's cyberspace as a mystic, mythical place.

Famous science fiction writer, Roger Zelazny's last novel, *Donnerjack,* cowritten with Jane Lindskold (Zelazny and Lindskold, 1997), takes the notion of cyberspace as the space of myths much more directly and literally. Once again, the reader is offered a realist vision of the digital landscape—hills, forests, mountains, and digital animals constitute Virtù, a realist cyberworld, paradoxically less technological in its outlook than its physical counterpart, Verité. Soon enough the reader discovers that Virtù taps directly into mythology and the spirit world, allowing for the existence of gods, ghosts, and anthropomorphic Death. Identity here is even more stable than in Marge Piercy's work, as immutable bodies provide a strong link between the character's actions in and out of the virtual reality. Indeed, body is of utmost importance in this novel, as one of its central themes involves a bodily crossing of the boundary between the physical and the virtual, between the analogue world of Verité and the digital spaces of Virtù. This motif, particularly significant for my exploration of the boundaries between cyberspace and bodily space, features also

in William Gibson's latest novel, *All tomorrow's parties* (1999/2000), and will be discussed in more detail in chapter six.

To have the ability to mold one's appearance in cyberspace need not always be as empowering as it is in Marge Piercy's novel; "Wolves of the Plateau," a short story by John Shirley (1989/91), provided a counterpoint. The Plateau of the title is the text's cyberspace, where the characters' subconscious drives and desires become manifest, made visible for all the coinhabitants of the virtual world through one's form and appearance there. The act of laying bare one's fears and secret cravings is a degrading act, but also liberating one, leading the characters to deeper self-knowledge and self-confidence. Entering cyberspace is a true rite of passage, capitalizing on disparateness of the two worlds to interpret the crossing of the void between them as a truly heroic event.

The same boundary is crossed in the opposite direction in John Varley's short story "Press Enter" (1985/6). Cyberspace, or rather the web of electronic connections pervading the modern setting, is shown as a carrier of surveillance and nefarious interests of hostile governmental agencies. The trope is typical of conspiracy theories, but the interesting thing for this study is the casting of global information network as enabling the disciplining of unwilling subjects. As the story follows the narrator's growing fear and paranoia of technological networks and surveillance methods, but does not involve the projection of consciousness into dataspace, it never engages the split between mind and body. When one character is killed and "consumed" by the workings of the electronic networks, the technological murder involves both the electronics and the human body: it consists of an unknown murderer stuffing the character's head into a microwave. The killer's identity is never divulged to the reader—cyberspace remains impersonal throughout the whole story. Another character's frantic escape from the clutches of the electronic network involves physical excision of all wiring from his residence—phone, power, and cable TV cords are all removed in an attempt to evade encroaching cyberspace.

Locating cyberspace

This brings me to the question of the physical location of virtual reality—one which is best tackled by first looking at the data traffic. At the moment, there are two distinct technologies available for that—wires (various kinds, from copper to fiberoptic) and ether (or air waves). Nicholas Negroponte (1995/6) claims that as the capacity of fiberoptic cables for transmitting data is close to infinite, whereas problems with interference severely limit the amount of data sendable through the air. His conclusion is that most of the data traffic will surely switch to cable-based communication, as it will be necessary to

> save all the spectrum we have for communication with things that move, which cannot be tethered, like a plane, boat, car, briefcase, or wristwatch (ibid.: 24-25).

An Ericsson official (personal communication) claimed quite the opposite, pointing to the fact that it is human beings who are becoming increasingly untethered, while still in need for vast amounts of data, thus increasing the demand for all sorts of wirelessly delivered information. Phenomenal growth of the cellular phone industry, together with the introduction of numerous new technologies for wireless data transmission, such as WAP, UMTS[9], or Bluetooth, provide arguments for this line of thinking. As is to be expected, both positions are widely represented in the discourse of cyberspace.

Cables are often associated with computer mediated communication; one of the leading magazines of cyberculture is, after all, called *Wired.* Gibson's cyberspace decks from the *Neuromancer* and its sequels are also devices which need to be plugged into the network; indeed, the user him/herself needs to plug into the Net as well. The same holds true for the Metaverse, the virtual space described in Neal Stephenson's *Snow crash* (1992/3): a fiberoptic connection is necessary for the transmission of the amount of data required to

[9]Wireless Application Protocol and Universal Mobile Telecommunications System

access it. The wireless pole is occupied by the cyberspaces in William Gibson's second trilogy (*Virtual light,* 1993/4; *Idoru,* 1996; *All tomorrow's parties,* 1999/2000): human characters can connect to cyberspace via handheld or wearable devices, and vice versa—digital personas can manifest in the physical world by means of portable holographic projectors. The same (or even greater) level of mobility is maintained in the far future, star-spanning setting of Dan Simmons' *Hyperion* (1989/94), where miniscule devices allow full contact with the datasphere on any sufficiently civilized planet.

The reach of cyberspace is limited by the technological level needed to maintain it, and this can be easily mapped onto any map of the physical universe. There is no reason to expect, however, that geography of the datasphere is in any way similar to that of the corporeal space. If anything, it is easy to surmise that the two have nothing in common. The connection holds, however, for the worlds of Virtù and Verité in *Donnerjack*: large parts of virtual space map easily onto physical space, so that places and structures of one world are reflected (and distorted) in the other. It is Virtù, however, which turns out to be much bigger, as it includes places that have no direct counterpart in Verité. The matrix of *Neuromancer,* despite access to it being wirebound, stretches out limitlessly into space, thus allowing the artificial intelligences of the novel to contact alien beings from Alpha Centauri.

It is only a short step from the wireless cyberspace existing everywhere (at least in the air) or Gibson's matrix stretching throughout the whole universe and the idea of dataspace hidden in-between the grain of physical space, in the form of miniscule particles capable of storing and/or relaying information. In Dan Simmons' *Hyperion* series (1989/94), the reader is even given an exact measurement of such particles' (called the Void that Binds within the novel's setting) size: numerically equal to Planck's constant, 6.626×10^{-34} Js, but measured in meters. In Neal Stephenson's *The diamond age* (1995), it is microscopic nanotechnological organisms/mechanisms which gather, process, and transmit the bulk of

human-related data, and by passing through bloodstream they colonize human beings, changing minds and bodies alike. Such microscopic cyberspace reflects very well the virtuality of virtual reality; it permeates all human space without encroaching on any of the human senses. It is physically present, but at the same time it is absent by virtue of being invisible.

The flip side of cyberspace's geography is its geometry which, in most cases, if it is described at all, emerges as a straight Euclidean space, or perhaps even a Cartesian one (Stone, 1991)—with a set of coordinates for locating user and his/her possible destinations in an unfamiliar world. Allucquére Roseanne Stone (ibid.) even suggests that Gibson's matrix was one of such spaces, but I did not get such an impression, and I am more willing to side with Jason Kneale (1999), who claims that Gibson used 'thin' description to convey his cyberspace's geography, relying on the reader to visualize the moods and mobilities used to describe the characters' forays into the matrix.

Another aspect of physical location of cyberspace is the location of its nodes and servers. Many cyberpunk novels never discuss this aspect, as dataspace gets defined as a virtual place that just needs to be accessed, hence the important locations being only the possible access places. The cyberspace of Gibson's first trilogy is one of such spaces, as its ability to reach up to Alpha Centauri (never visited by humans in the novel's setting) aptly demonstrates. The mythic Virtù of *Donnerjack* is another such place, and in the Metaverse of *Snow crash* the characters simply never concern themselves with the physical location of the data they access. In *Body of glass,* important data is to be found on corporate servers, presumably located somewhere in the corporate buildings, though this aspect is never actually spelled out. In Gibson's *All tomorrow's parties,* the readers learn that the one of the main characters

> had a theory about virtual real estate. The smaller and cheaper the physical side of a given operation, the bigger and cheesier the website (Gibson, 1999/2000: 75)

This theory, of which there is some anecdotal evidence in the novel, points to the cyberspace's role in subverting the traditional power structures, as well as to its hyperreal aspect of images bearing no relation whatsoever to whatever they represent. Issues of power also touch the subject of the disenfranchised, of people denied access to cyberspace, left on the deprived side of the digital divide. This is not a subject often breached in cyberpunk fiction, where reasons for one's suffering tend to be personal and individual rather than directly resulting from the system. Case in *Neuromancer* got cut off from the matrix (his only source of income) when his nerve system was damaged by his former employer as a punishment for disloyalty. *Snow crash's* protagonist, Hiro (who uses Protagonist as his last name), has access to privileged spaces in the Metaverse he helped to construct. But the masses of people who have never had the opportunity to enter cyberspace (and the bleak world of cyberpunk novels suggest the existence of large numbers of such people) are not explicitly discussed. Similarly, William Mitchell (1995) notices the inevitable formation (or continued existence) of such groups, but does not consider it an important topic for discussion in a book on cyberspace and digital cities. This is not to say that there are no publications dealing with the technologically deprived—Donna Haraway's (1997) *Modest_Witness@Second.Millennium* is one of them, Zygmunt Bauman's (2000) *Postmodernity and its discontents* is another; in fact, the topic of digital divide (between the Internet haves and have-nots) has started getting some attention lately (e.g. Norris, 2001). Still, most of what is written about cyberspace (e.g. Moore, 1995; Jonscher, 1999/2001) gleefully ignores everybody who is not invited.

Notions of cyberspace encountered in science fiction novels and short stories are also articulated in different media. Perhaps the most important of these is film, as it allowed for

literal visualisations of cyberspace as envisioned by the director. Let us then look at a few science fiction movies dealing with this subject, as their analysis can provide us with crucial insights into the virtual reality discourse. The most obvious movie to start with is *Johnny Mnemonic*, based on William Gibson's short story of the same title (1981/7). The movie boasts a number of cyberspace sequences, and presents a digital world in which most objects look distinctly geometric, neon and chrome, glitter, and emit jarring, computer-generated sounds when manipulated. The pace of events is much quicker in cyberspace than in the physical reality, a characteristic often present in cyberpunk novels as well (e.g. Gibson, 1982/7; Stephenson, 1992/3). Regardless of the abstractness in presenting objects, space of the matrix remains Euclidean.

The virtual reality of the movie *Matrix* is even more mimetic, as it is supposed to be modelled after the physical reality of the late 1990s. Nevertheless, sufficient knowledge of the code, the program responsible for visualization, allows one to perform feats impossible outside the computer reality, including, once again, moving at speeds normally inaccessible to human beings. Virtual reality of the movie is presented as a false world, and learning the rules behind it leads to liberation, and to the discovery of the true world of physical reality. The notion of underlying code is particularly important in this vision, as cyberspace in its true form, that is shown as columns of textual characters, is said to be easier to interpret to the trained eye than the actual visualization. Mastery and control form the central theme of *Matrix'* representation of cyberspace; visible not only in the struggle to gain knowledge of (and thus power over) the virtual space, but also in the characters' learning to use their minds to transcend the limitations of their bodies. *Matrix' c*yberspace being a very close approximation of the actual world (although one taken from the movie world's past), bodies play an important role; however, it is an entirely negative one—they represent a boundary that needs to be transcended, a limitation that the mind is capable of overcoming.

David Cronenberg's *eXistenZ*, a film depicting a limited customer test of a new computer game that turns into a Kafkaesque nightmare for its participants, stands out as a movie which is not seduced by the Cartesian mind/body dualism, despite tackling many of the same themes and tropes as *Matrix* and *Johnny Mnemonic*: the ability to distinguish between the corporeal and the virtual, the commitment to the corporeal world, and the authoritarian control exercised over cyberspace by some shadowy force. The most striking aspect of the originality of *eXistenZ* is its use (and foregrounding) of organic computers: biological constructs used for connecting into virtual reality. The imagery helps to establish a strong emotional link between the users and their decks—much like the art of a Swiss surrealist Hans Ruedi Giger used for sets and monster designs in the *Alien* movie tetralogy, repugnant and alien looking life-forms invoke the twin emotions of repulsion and attraction, thereby visualizing the addiction the protagonists feel towards their computers. This interpretation is strengthened by the involvement of violent penetration of the body in entering the cyberspace—first by a phallic metal implement installing a connection socket, and later by a connection cord originating from the biological deck. Orgasmic expressions of the connected users further reinforces this impression. Another effect of the organic nature of the computers is the displacement of the flesh (or meat, to use Gibson's lingo) and machine (or metal)—Cronenberg's cyberspace is situated on the side of the body.

The film's originality is also evident in its portrayal of cyberspace. At first sight, it is a very realist place, sharing quite a lot of similarities with the corporeal world of the movie. Its virtuality is asserted not via spectacular special effects (as in *Matrix*), but rather by technical glitches: minor characters repeat the same phrase and gestures over and over again, waiting for the protagonists to supply the appropriate code-phrase, which would allow the plot to advance.

Finally, the film stacks virtual realities upon one another, achieving the hyperreal effect of losing the original, of there being only layers upon layers of simulacra, of realities that can no longer (bar the occasional glitch) be told apart from the original one (Baudrillard, 1986/98). *Matrix* attempts a similar move in its portrayal of the 1990s space as virtual, but falls short through repeated stressing of the importance of the real—in fact, one character's willingness to embrace the simulated world leads to his treason and, subsequently death at the hands of the realists. *eXistenZ,* on the other hand, underscores the impossibility (and, perhaps, unnecessity) of pitting the virtual against the real, and of demarcation of stable and unbreachable lines between the two. The film ends when the protagonists apparently emerge from a long virtual reality sequence that comprised the bulk of the story. However, instead of returning to the subdued mode of interaction associated with everyday life, they engage in acts of terrorism on par with the violent narrative they have been enacting in virtual reality. There is no way to tell if this sequence actually takes place still inside a very lifelike virtual reality (making the exit from simulation shown earlier another part of the game) or in a rather violent world outside it. The viewers are not the only ones who are not sure—the film ends with a minor character's anxious and unanswered question: "are we still in the game?"

Bodies in cyberspace

The search for a possible answer could begin with the exploration of the spatial involvement of one's body in a given space. In a recent study of heavy Internet users, Annette Markham (1998) has shown a broad spectrum of relations emerging between people, their online experiences, and their bodies. She interviewed people constantly manifesting their bodily presence over the net, constantly smiling, waving, doing push-ups and describing their trips away from the keyboard, as well as users whose online personalities strived for detachment and escape from the body hunched in front of the monitor. She tells an important lesson about the multitude of possible approaches—all her

ten interviewees have their own stories to tell, their own interpretations, and their own ways of coping with online experiences. The stories are unique, irreducible to a single overarching scheme; Markham's own delineation of three ways of seeing cyberspace—as a tool, a place, and a way of being seems inadequate, failing to capture the multiplicity of experiences. This of course lays bare the difficulty inherent in this research, aiming to understand the notion of space as experienced in and around cyberspace. Yet I believe that such an attempt is not necessarily futile, though it needs to remain open to multiple meanings and changing interpretations, and avoid the lure of rigid orderings (Law, 1994).

Markham's multifaceted description of life on line captured much of its current diversity, but for a more technology conscious (or technology driven) account, I need to turn elsewhere. William J. Mitchell, a professor at MIT, aims to provide such a description in his *City of bits* (1995). It soon becomes obvious that his vision is decidedly rosy, and cyberspace is presented as a long-awaited cure to many of humanity's current lacunas. The important problems are all mental, though, as human bodies are largely excised from Mitchell's vision of the future, with spatiality safely confined to the realm of the virtual. Indeed, all human contact is retranslated as a problem of bandwidth, that is the rate of transmitting information. Humans favour physical contact only because the amount of data exchanged is so much bigger than in other situations. New technologies, the seeds of which are already available, are supposed to allow us to alleviate the problem of low bandwidth, making cyberspace indistinguishable from (though superior to) the corporeal space. In a skilful rhetorical trick, Mitchell uses present tense to describe life in the utopian future, making the reader feel that even if such technologies are not yet available, they will be in a matter of seconds. At the same time, any problems encountered with today's systems are easily arrayed by the assertion that the technologies are not *yet* perfected. Contrary to our previous experiences with technologies (e.g. proliferation of cars leading to traffic jams and pollution), no new problems are expected to emerge.

The list of anticipated, but already perceivable, advantages to digital communication is truly impressive. Nicholas Negroponte (1995/96), another MIT professor and the director of Media Lab, sees the replayability of digital information as one of its chief assets; his collaborator, Steve Holtzman (1998), praises nonrepeatability as the distinguishing characteristic of digital worlds. Negroponte sees digital communication as free of its medium, as capable of being extensively processed at the receiving side, and presented in any form and any interpretation. Holtzman, on the other hand, confirms McLuhan's famous statement that medium is the message, and points out its ultimate realization in the digital media. They are both enthralled by the prospects offered by cyberspace, and, what's even more amazing: they don't seem to be in any sort of a disagreement, with Holtzman repeatedly and appreciatively quoting Negroponte.

The wide array of opinions regarding future developments coupled with high expectations of technological progress bears witness to the interpretational flux surrounding the issues of cyberspace, and thus to the open possibilities to construct meanings from the experiences of computer space; they have not yet become clichéd, there are no culturally entrenched schemes for interpreting and presenting computer-related experiences.

Computer space has not yet been colonized; it remains an empty space available for constructing new and creative interpretations (Kociatkiewicz and Kostera, 1999). It passes largely unnoticed in everyday life, and no agreement as to what is its appropriate shape and form of usage has as yet been reached. Much as spaces such as unwelcome, "dangerous" neighbourhoods or service areas of public buildings remain beyond attention of most of the passers-by (Kociatkiewicz and Kostera, 1999), so are computer spaces constructed and traversed without their users giving much thought as to their form.

Some trends have, however, already arrived, and one of them deals with important demarcation lines. A short conversation from Neal Stephenson's *Snow crash* aptly

demonstrates this. Hiro, the protagonist, is offered a drug in cyberspace—a deeply surprising development, as drugs are supposed to be confined to the corporeal world. Convinced, much like the novel's model reader, of the stark boundary dividing the human mind and computer equipment, Hiro tries to learn about the area of the drug's influence:

> "Does it [the drug - JK] fuck up your brain ?" Hiro says. "Or your computer?"
> "Both. Neither. What's the difference?" (Stephenson, 1992/3: 41).

Hiro's interlocutor turns out to be right: the difference is barely (if at all) noticeable. This does not mean that there are no sharp boundaries, just that the line of division lies elsewhere. In the world of the novel, a veritable rift separates the body from the mind-computer nexus. And with the computer ready to administer all the desired (another word taken away from the body) stimuli to the mind, the body is left to its usual cyberpunk fate—silence, obscurity, and a complete lack of attention paid to it. After all, there's cyberspace (complete with mind/computer) to attend to!

Chapter 4: Physical space and mobility

Space and place

In the previous chapter, I presented the most common conceptualizations of cyberspace in both academic and literary discourses. Now, I would like to turn towards physical space in these discourses. Although the most striking characteristic of the interpretations presented in the previous chapter was the exclusion of the body from the virtual realm, the body itself will not be the foremost of my concerns in this analysis of physical space. This is not because I consider it as negligible as many of the proponents of cyberspace do—quite the contrary, I think it is the body and the spaces it occupies that are crucial to understanding how space is constructed and produced in a computerized setting. This is why the whole of chapter six is devoted to the examination of how body is shaped and performed in a computer-related discourse. Here, however, I want to take a more general look at physical space, its most important conceptualizations, and the forms it is seen as taking. My focus will remain on the spaces surrounding computers, and because of this my analysis will continue to build on the dichotomy between the physical and the virtual.

So far, I have mostly avoided tackling the issue of the construction of space in general. Examination of the discourses on cyberspace did not necessarily warrant such reflection. As it is largely 'imagined' or created, mediated, and maintained through the use of high technology (although I hope to have shown that a wide range of discursive practices has been also employed in its constitution), it is easy to perceive cyberspace as a social (or at least cultural) construct. Yet physical space is often understood as an objective entity, existing independent of human experience and interpretations. In David Harvey's words:

> Space and time are basic categories of human experience. Yet we rarely debate their meanings; we tend to take them for granted, and give them common-sense or self-evident attributions. (1990: 201)

Henri Lefebvre similarly declares that "(social) space is a (social) product" (1974/91: 26). The assertion of reality being socially constructed implies that space (a part of reality) is similarly created and interpreted through social interaction.

It is important to note that the word "social" is superfluous in Henri Lefebvre's quote. Anthropologists such as Claude Levi-Strauss and linguists like Julia Kristeva have demonstrated that human experience is inherently social, mediated by culture and language, and thus anything non-social falls outside the bounds of human experience and understanding, and thus remains unknowable. Still, from time to time I use this adjective to stress the socially constructed character of examined phenomena, rather than to differentiate them from their non-social counterparts.

Physical space (in contrast to virtual space) has been an object of much sociological and philosophical examination. While I do not wish to repeat or summarize all the arguments resulting from this examination, I would nevertheless like to highlight some of the issues important to my own analysis of the way space is constructed around computers. In the previous chapter, I concentrated on two important discourses of cyberspace—the academic and that of science fiction. In my examination of the physical space, I shall follow the same sources, so as to accentuate the possible interplay between the two spaces. The choice of science fiction is perhaps less obvious here, as many other genres of art present reflections on the physical space, and often concentrate on this issue much more than science fiction does. Yet even in examining physical space, I am interested mostly in the areas surrounding computers and computer networks, and the discourse of science fiction stays the closest to such setting, and to exploring relations between human beings and high technology.

In the academic reflection on spatiality, perhaps the most interesting distinction to consider is the one between space and place. In this opposition, place is understood as a

localized, contextualized nexus of experience, and space as a boundless setting allowing for positioning of objects and actions. In the geographer Yi-Fu Tuan's words, "[p]lace is security, space is freedom" (1977: 3). Philosopher Edward S. Casey notes that classical discourse

> espouse[s] the view that place is something posterior to space, even made from space. By "space" is meant a neutral, pre-given medium, a tabula rasa onto which the particularities of culture and history come to be inscribed, with place as the presumed result (1996: 14, original emphasis).

He argues that experience actually runs the other way, with place being the primary form, which is only later generalized and abstracted as space. Michel de Certeau holds a similar view, describing space as a "practiced place" (1984/88: 117), which "exists when one takes into consideration vectors of direction, velocities, and time variables." (p. 116). This short description touches on a number of interesting points which need to be taken into account when examining the notions of place and space.

Mobility

First of all, the idea of vectors and velocities clearly posit the notions of mobility and motion as central to the spatial discourse. They are often also seen as constitutive for the distinction between place and space. Place is seen as doubly immobile—it cannot be relocated and it restricts mobility of its inhabitants; Tuan highlights the latter characteristic by using the word "rootedness" to describe human beings' attachment to particular places (1980). It tends to be a bounded space, although its borders do not have to be impenetrable; indeed, Casey claims

> that porousness of boundaries is essential to place. A place could not gather bodies in the diverse spatiotemporal ways it does without the permeability of its own limits. The sievelike character of places might well be regarded as another essential structure of place, one that could be called "elasticity" (1996: 40-41)

Regardless of their porousness, though, boundaries and limits are crucial in restricting mobility. In contrast, space is perceived as limitless, and defined by (possible) velocity as much as by position. Deleuze and Guattari make a similar point by distinguishing between striated and smooth spaces (1986). Striated space resembles place—it is sedentary, ordered (or at least subject to ordering), and governable; in Deleuze and Guattari discourse it is associated with the State apparatus, with control, hierarchy, and oppression. Its opposite, smooth space, is seen as consisting of movement, of lines of flight rather than of destinations, it is "marked only by 'traits' that are effaced and displaced with the trajectory" (1986: 51). Smooth space represents nomadism and the war machine, subversiveness and evasion of control. The two spaces are supposed to be incommensurable, i.e. impossible to present in each other's terms; smooth space flows around and avoids striated enclaves, while striated space seeks to subjugate nomadism, but in the same process it binds and stratifies the heretofore smooth space, thereby converting it into another striated space.

While many authors agree on the role of mobility in differentiating place and space, they often differ in their interpretation of the changes in contemporary culture (and world). For example, already in 1970 Alvin Toffler declared demise of place in the wake of tremendous advances in communication technologies and in general physical mobility. John Urry sees mobilities as the main area for sociological research in the 21st century. In fact, he thinks that the concept of society is already reactionary, and that it

> will in the future be one particularly deployed by especially powerful 'national' forces seeking to moderate, control and regulate these variously powerful networks and flows criss-crossing their porous borders (2000: 1).

Deleuze and Guattari, on the other hand, lament the loss of smooth space and nomadic freedom from oppressive relationships. Benjamin Barber points to the possibilities of surveillance and erosion of privacy that stem from the proliferation of electronics, as well

as from the accumulation of capital in the hands of the few movers of what he terms "the infotainment telesector" (1997).

Regardless of the threats to nomadism and unfettered movement posed by new technologies, Paul Virilio (1986) proposes speed as a chief characteristic of the contemporary world, obsessed with immediacy and instant delivery of information. Jean Baudrillard echoes this in describing the world as accelerating into the realm of simulacra, of images that have lost all connection with the reality they claim to represent (1995/6). If speed transforms place into space and the real into the hyperreal, could it be that it also the physical into the virtual? In other words, is physical space closely related to the idea of rooted place, whereas cyberspace has more in common with the smooth and boundless space? Pierre Lévy (1997), like other enthusiastic proponents of cyberspace, seems to think so. His vision, however, goes even further—he sees virtual spaces not only as sites of freedom, but also as sources of it—cyberspace has the power to transform the physical, to liberate its inhabitants from the relations of power prevailing in the physical world. Others expect the physical to transcend into the virtual, as Baudrillard somewhat disdainfully describes:

> One day, perhaps, all that substance will be transformed into energy and all that energy into pure information. This will be, in a way, the definitive 'acting out,' the total achievement, the final solution. Everything will be accomplished, realized and, at the same time, ejected into the void. Delivered from ourselves, we shall enter the spectral, problem-free universe. This is what is meant by the great model of Virtuality (1995/6: 37).

Lance Strate (1999) argues against the overly limiting nature of such a notion. Although much of the discourse and practice of cyberspace celebrates it as a new electronic frontier, as wide expanse symbolizing freedom and opportunity, it is not the only conceptualization in existence. Various online communities are intent on creating cyberplaces in the virtual space, binding people together and creating the very sense of security which epitomized

place for Yi-Fu Tuan. Still, these communities are also always potential sites for social exploration or subversiveness, be it in norms of interaction or in constructing identities. Julian Dibbell (1993/6), in an essay entitled "A rape in cyberspace: how an evil clown, a Haitian trickster spirit, and a cast of dozens turned a database into a society," describes an event in the life of LambdaMOO, a text-based virtual world. One of the users utilized his superior computer knowledge to take over the actions of the personas of other computer users, raped them, and forced them to perform degrading sexual acts. The event took place in a public community space. Sherry Turkle (1995/7) tells a story of a male psychologist who assumed an identity of a female disabled person in order to develop intimate online relationships with other women, who later felt betrayed when they learned of his secret. Both these cases concern what many perceive as abuse of the appropriate online behaviour, and both were widely discussed and interpreted. They are connected, apart from the anguish of the victims, by the perpetrators' use of the particularities of cyberspace—any of these events would have been much harder to carry out within the confines of physical space. They prompted the concerned online communities to develop ways of dealing with such happenings, i.e. of providing security at the expense of freedom—construction of place in cyberspace is an involved an complex process. They also showed the possibility of very strong power relations in the virtual realm, often duplicating the hierarchical structures of physical space—both stories concern a (physically) male offender abusing (physically) female victims, in a setting created through the use of information technology.

Fortunately, other stories of online communities tend to be less oppressive. Chip Morningstar and F. Randall Farmer (1991) recount their experiences with Habitat, a commercial online computer game and community created in 1980s. They link playing satisfaction to the consistency of the game world, and stress the importance of maintaining the world's veracity—the best solutions to any of the game's problems should

be found without forcing the users to step out of the virtual world and without violating its rules. Similarly, in the already mentioned case of virtual rape, LambdaMOO inhabitants decided to carry out punishment on the responsible character (i.e. the virtual persona who committed the crime) without taking any legal action in the physical space. Such separation needs a departure from the centralized notion of identity, and coming to grips with the incommensurability of various social settings that characterizes postmodernity. Psychologists Kenneth and Mary Gergen (1988) propose a daring redefinition of the notion of self, and the acceptance of multiple selves that have little or nothing in common. In a different take on the fragmentation of self, N. Katherine Hayles (1999) sees human psyche as consisting of multiple agents, each independently responsible for different actions and drives, only tenuously managed by human consciousness. The price to be paid for the multiplicity of selves is the lack of one coherent life narrative, and thus the loss of some of the sense of continuity. This in turn threatens security, which has often been cited as one of the victims of postmodernity (e.g. Bauman, 2000; Urry, 2000).

Practice

The second important aspect of both space and place is their relation to social practice—they provide a setting where social practice can unfold, while at the same time being defined by this very practice. Henri Lefebvre stresses this by calling space as (social) product, although such description fails to accentuate the processual nature of space productio—space never becomes a completed work, it is constantly reframed and reconstituted through the social relations it is involved in.

> The stability of the social world... is not due to an eternal structure, but to situated actions that create and sustain shared understanding on specific occasions of interaction (Suchman, 1987: 66).

The need for constant maintenance is of course true of the entire social reality, but it is particularly easy to misconstrue space as an immutable container for social action, or at

least as a commodity capable of retaining its form and function long after its construction has ended. Mikael Jonasson takes this point up in his ethnography of urban traffic:

> Practice is not distinguishable from a place. The practice constitutes, is, the place. Places are created through practice and performance of identities and all other kinds of work at a place (2000: 24).

In order to understand space, one needs to study how it is inhabited, by whom, and what it is used for. But of course mere observation of what people do does not tell the watcher anything about the space. David Harvey asserts that

> [t]he grid of spatial practices can tell us nothing important by itself. To suppose so would be to accept the idea that there is some universal spatial language independent of social practices. Spatial practices derive their efficacy in social life only through the structure of social relations within which they come into play. (1990: 222-223).

It is thus important to examine all the actions involved in constructing space, including interpretation and the ascription of meanings to various spatial practices. Sensemaking takes place throughout all human activity, and the construction of space is in no way different. And in order to understand sensemaking, one needs to identify the social actors involved in the process. Henri Lefebvre describes it thus:

> A social space cannot be adequately accounted for either by nature (climate, site) or by its previous history. Nor does the growth of the forces of production give rise in any direct causal fashion to a particular space or a particular time. Mediations, and mediators, have to be taken into consideration (1974/91: 77).

In other words, space needs to be seen through the social practices and sensemaking activities of its inhabitants, that is both human and non-human social actors. As I have already noted in chapter two, actors are not easily differentiated, as they are always embedded in networks, conglomerates, rhizomes—a computer user can exist only

together with a computer, and computer network is inexorably bound to the power grid. Similarly,

> [p] laces are not composed of neatly fitted entities that clearly can be separated or defined by scales or levels. In this study, places are seen as nexuses for and of practices and relations (Jonasson, 2000: 28)

Deleuze and Guattari (1980/88) describe the process of constructing space in terms of the twin currents of deterritorialization and reterritorialization. The former describes the opening up of interpretation, the seeking of new definitions, and also of new uses of each space. Yet it is always accompanied by its opposite, the reterritorialization, which crystallizes the new definitions, limits the possible ways of expression, settles the appropriate behaviour in the given setting. The fall of Communism in Poland in 1989 has been a prime example of deterritorialization—new possibilities appeared, things up till then forbidden or even unthinkable suddenly became doable. Space was being redefined as well—in a grassroot move towards the free market, marketplaces started to crop up in many of the public spaces in Warsaw, including Plac Defilad, then the biggest city square in Europe, and the prime site for military parades and state celebrations during the communist regime. Soon enough, reterritorialization began taking place as well—as the vision of the independent Polish state solidified, so did the consensus on what constitutes the proper usage of public space—open-air marketplaces were deemed improper for the centre of a European capital. Despite such decision, the twin processes continue—a new marketplace has sprung up in an unused sports stadium. Called Jarmark Europa (Bazaar Europe), it is currently the biggest marketplace in Europe. This location, however is deemed unacceptable as well, and talks are in progress about its closing or relocation. The story serves as a prime example of Deleuze and Guattari's thesis that

> [e]very rhizome contains lines of segmentarity according to which it is stratified, territorialized, organized, signified, attributed, etc., as well as lines of deterritorialization down which it constantly flees. There is a rupture in the

> rhizome whenever segmentary lines explode into a line of flight, but the line of flight is part of the rhizome (1980/88: 9).

Senses

The third point in this examination of space/place involves looking how experience, perception, and sensemaking are involved in the construction of space. Yi-Fu Tuan (1977) insists that there is a very strong and direct connection between (physical) space and experience. Space, he argues, is foremost what is posited by human senses, which only later becomes abstracted into a mind-image of one's surroundings. Although Tuan takes care to acknowledge all senses' importance in constituting space, in the Western discourse vision tends to be regarded as the privileged sense, superordinate towards all the others, as Michel Foucault demonstrated in his study of the panopticon (1975/91). Furthermore, gaze is an instrument of power, objectifying and dominating whom and what is gazed upon. Gibson Burrell (1997) tells an emblematic story of Vlad the Impaler ordering a woman to be tortured and killed because she allowed her husband to appear in dirty clothing in sight of the ever watchful monarch. The act of looking reproduces power relations, constitutes the dominant subject and the submissive object (Berger, 1980/99).

But vision itself is changing through the emergence of new technologies, losing its immediacy, blurring the boundary between the real and the simulated. Building on an analogy with smart weapons capable of destroying their target as soon as they can perceive it, Paul Virilio states that in the postmodern world "what is perceived is already finished" (1988/94: 69-70)—simulated images drastically extend the range of one's sight, while at the same time undermining the veracity of the experience of vision. In Baudrillard's writings, objects disappear as the velocity increases, and the speed of social circulation is seen as responsible for the proliferation of simulacra (1990/3). Yet the linking of vision and weaponry reflects the same associations as in the story of the medieval Romanian ruler—the act of looking equated with oppression, suffering, and eventual death.

The coupling of vision and power means also that perception cannot be separated from sensemaking—it is always a process of selection and of ordering reality—beliefs determine perception. Umberto Eco (1998/2000) recounts the story of Marco Polo claiming to have seen a unicorn during his travels. The unicorn, however, turned out to quite different from its classic description—nowadays it is believed that the animal Marco Polo saw was in fact a rhinoceros. Nevertheless, the European traveller was prepared to encounter a unicorn and not a rhinoceros, and thus his experience was that of meeting a dark, fat, ugly, and not very graceful unicorn.

Order

Perception is an inherently spatial process—only space and spatial formations can be grasped by human senses. Space, thus, is the very stuff of sensemaking, and sensemaking can be understood as the process of ordering reality. Yet it is possible too conceptualize ordering in two entirely different ways—as constructing a "thin film of order, forcibly stretched over Chaos, but incessantly torn, ruffled, pierced, and shredded by it" (Bauman, 1994: 46), or as discovering the inherent order of the natural world. Bolesław Szmidt epitomizes the latter attitude in his book entitled appropriately *The order of space* (1981). The book deals mostly with architectural space, and its stated objective is to conflate the categories of outside and inside. The author, however, attempts this task through proliferating dichotomies and hierarchies, the chief of which is of course the opposition of order and disorder. It is interesting to note that disorder is quite often assigned the role of the ultimate evil, with proponents of chaos theory and anarchists alike keen to attest that their interests have nothing in common with disorder (Kociatkiewicz and Kostera, 1998). Szmidt similarly describes architecture as the task of discovering and bringing out the natural order of space. Accordingly, architecture should strive to reduce the possible randomness. There are no unimportant details, and excessive innovation is also frowned

upon—after all, it inhibits the steady progress towards the perfect form that has been the guiding force behind architecture since the dawn of time.

Outer space

Although this vision seems quaintly outdated in its modernist sensibilities, it is nevertheless interesting in its embrace of the attitudes characteristic to the pre-cyberspace visions of the physical space. It comes as no surprise, then, that Szmidt sees the Moon landings as the most impressive event in the uncovering of new horizons of time and space; as I have already noted in the previous chapter, spaceflight used to form the backbone of science fiction writing, though the focus has shifted somewhat in response to the appearance of the notion of cyberspace. Paul Edwards (1995) sees the enthusiasm for space travel as fuelled by the desire to escape from what he calls the "closed world" of Cold War reality; the entire globe being seen as a battleground between the capitalist West and the communist East. Additionally, with the end of the Cold War, the worldwide apocalypse (nuclear or otherwise) seems somehow less imminent, reducing the pressure for immediate (or as close as one can get) emigration off planet. Recent terrorist scare, while significantly raising the level of popular insecurity, does not seem to threaten the planet as a whole, nor even all of humanity. Similarly, the often extreme terrorism countermeasures do not (yet?) appear to lead towards global annihilation.

In Tom Godwin's 1954 short story, "The cold equations" (1954/87), outer space is presented as the modern day wild frontier in precisely the same ways used nowadays e.g. by Barlow (1996) to conceptualize cyberspace. But the structure of outer space is entirely different—it consists of destinations, of stars and planets and distances between them, whereas cyberspace is a *medium*, both for the purpose of travel and for communication—in fact, Barbara Kita claims that new audiovisual technologies are all means of transport (1998). Outer space is characterized by lack of medium, which is why science fiction

authors are keen to devise ways of shortening interstellar travel times, or reducing characters' activity (and thus boredom) during those periods. Relativistic physics provides the first nudge, as it posits the relative slowing of time for a traveller moving at velocities close to the speed of light. Other ideas include cryogenic sleep (e.g. Anderson, 1984), traversing different dimensions, or hyperspace, to cut down travel time (e.g. Bujold, 1991/8), and instant teleporters between different worlds (e.g. Niven, 1970/99).

Teleportation is a particularly interesting idea, as it highlights the decoupling of time and space, which Anthony Giddens (1990) sees as emblematic of the contemporary world (called by him the late modernity). Journey times become less and less dependent on the actual distance travelled, and teleportation extrapolates this characteristic to its logical conclusion—the destination is reached instantly, regardless of its physical location. Microsoft's advertising slogan, "Where do you want to go today?" implies the same ease of movement—all destinations are at hand, no longer differentiated by the effort or time it takes to reach them. Yet Microsoft obviously refers to cruising cyberspace, and not to any movement in physical space—the latter is dismissed as unimportant, and at the same time it becomes more restrictive and constraining. There is no longer any perceived need for physical travel, and thus the possibility of such travel becomes limited. One more aspect of teleportation as presented in science fiction novels deserves mentioning: it is often presented as needing appropriate technology at both the start and the destination sites. It is thus useless for exploration, and furthermore perpetuates original power relations, particularly the center-periphery distinction; periphery remains outside the realm of instant travel, sustaining and even enhancing its subjugation. In the discussion of contemporary world, this can be seen as an analogy to the digital divide, or the growing rift between the technology haves and have-nots, between the rich and the poor (cf. Bauman, 1998/2000). But it can also be seen as the image of the split between the virtual and the physical,

between the instant communication and physical distance, between telepresence and isolation.

Where cyberspace is characterized by sensory overload, bombarding the user with more information than s/he can possibly analyze, outer space causes sensory deprivation, leaving its inhabitant desperate for any means of shortening the journey. In Philip K. Dick's short story "I hope I shall arrive soon" (1987) a spaceship's onboard computer is confronted with this very problem—how to provide necessary sensory input for the passenger who couldn't be hibernated for the duration of a ten years' long journey. Not having access to any outside sources of interesting data, the ship endlessly recycles the passenger's memories, as well as its information about the destination planet, making the human experience his future as well as his past. The time is conflated into the everlasting present, consumed and virtualized by the all-encompassing, yet empty, space. Coupling the overpublicized Chinese curse 'may you live in interesting times' with Pangloss' recognition of this being the best possible world leaves one awash in the sea of boredom, desperately struggling to escape into the hyperreal virtuality of cyberspace.

City space

Fortunately, outer space and cyberspace are not the only possible sites for human habitation; cyberpunk novels and films are much less likely to concern themselves with interstellar travel than traditional science fiction, and the space of their setting tends to be much more limited than to the whole planet. Although cyberpunk characters often travel between various cities, even on different continents, they seldom venture out of the urban environment. When they do, they encounter inhospitable wastelands, well justifying their predilection for staying in cities.

The division between the city and the wilderness is perhaps the most striking in cyberpunk movies, although it is present in the literature as well. Thus, in *Matrix* there are two

worlds—the virtual reality represented as a modern day city, and the true world pictured as a nuclear wasteland. In *Blade Runner* the whole story takes place in an overpopulated, highly polluted metropolis (Los Angeles of the year 2019), although in the final happy ending scene the characters leave it behind and venture out into green hills under a blue sky. This scene contrasts very strongly with the setting of the rest of the movie and was, significantly, missing from the director's cut released in 1992. Richard Stanley's *Hardware* is set in a dilapidated city, although one character goes out and into a radiated desert. In *Terminator*, city scenes from the present time are interspersed with shots of the war taking place in a wasteland that is future Earth. Cyberpunk books follow suit—in William Gibson's *Neuromancer* (1984), for example, the characters travel between Japan, U.S.A., Europe, and orbital colonies, but all the places they visit retain an urban feel. George Alec Effinger's *When Gravity Fails* (1986) maintains a similar setting. The movie *eXistenZ* proves once again unusual in that large parts of it take place in isolated wilderness, but as at least most of the story is set within a video game, the quaint locations shot in bright, livid colours build on a strong tradition within computer adventure games and not on the cyberpunk genre.

> If cities are so central to the discourse of computerized space, it might be worthwhile to peek into the organization of city space. For although Marshall McLuhan (1964) described the world transformed through the new media as the global village, and numerous claims have been made about the demise of the city due to telecommuting, in most cases the new technologies retain a distinctly urban flavour (Ray and Talbot, 1999)

The geographer Nigel Thrift (1996) sees the contemporary city as constituted foremost by the flows of capital, traffic, and communication. It is a fluid space, existing only through practices and their negotiation by the inhabitants and visitors to the city. Mikael Jonasson (2000) presents space as constituted through its occupants' performances, that is behaviour driven by communication and contracts rather than by rules that can be set beforehand. Echoing Serres (1982/95), he also stresses the importance of quasi-objects,

that is cultural ideas and conditions embodied as (or inscribed onto) physical objects, which are then often taken as value-free and devoid of meaning. For Edward Soja, cities should be understood primarily as "specialized nodal agglomerations built around the instrumental 'presence availability' of social power" (1989: 153). The central issue are the struggles surrounding the accumulation of capital and the problem of uneven development—the Marxist perspective that both he and Lefebvre come from sets out to tackle the distribution of power, and concentrates on conflict rather than communication, subjugation rather than agreement.

The issue of power is also close to the heart of Zygmunt Bauman, who sees the city as the prime setting for the actualization of hierarchical power—city space is divided according to the status of its inhabitants and access by the non-authorized (that is, those finding themselves too low on the social ladder) people is appropriately restricted (1998). This is the striated space *par excellence,* one aiming to allow no freedom for reinterpretation. A similar trope of social fragmentation can be found in Neal Stephenson's *Snow crash* (1992/3). There, North American cities of the near future are divided into burbclaves—semi-autonomous, commercially run, local communities, mostly operated as franchise chains. The idea can be seen as a commentary on the contemporary gated communities, but not only that—it touches the issue of the disappearance, trough privatization, of public space. Dariusz and Joanna Jemielniak recount the story of Potsdamer Platz in Berlin—a big square in the center of the city which has been handed over to a private company:

> There are shops, marvelous cinemas, an opera, McDonald's, etc. There are no pubs, and there is little night life—but the result is interesting: a clean public space for "decent" people. The trick is that people who are not properly dressed (which means that they look poor) may be asked to leave the area as, when all is said and done, it is private (2001: 123).

George Ritzer (1995/6) sees shopping malls in a similar light—as public space turned into private property. This means strong access restriction, and pressure on visitors to behave

in preferred ways—as consumers rather than as participants of public life. Once again the city space is organized as a rigid structure, defining and confining its inhabitants.

A hyperbole of such vision can be found in John Shirley's short story "Wolves of the Plateau" (1989/91). The protagonists are inmates in an American federal prison; they attempt to break out, using smuggled-in chips allowing them to access cyberspace in order to facilitate their escape. The act of entering cyberspace is presented in the story as synonymous with breaking out. Physical world is thus posited as literally the prison of the flesh, and escape is possible only through the shift into the virtual.

Computers in space

This view is further strengthened by a look at the ways computers exist in physical space. Most of the computers currently in use are fairly large desktop machines (complete with a bulky monitor), firmly attached by numerous cables to the power grid, network, and peripheral devices. Quite often they inhabit office space characterized by rigid dress and behaviour codes. Even in home settings they are often housed on special desks with additional shelf for the keyboard—unlike the furniture used to store TV equipment, these desks typically mount no wheels facilitating their moving around. Mobile laptop computers are plagued by their short battery life and still considerable bulk and weigh. In the last few years the average battery operating time has not increased, as newer, more powerful and power-hungry hardware more than compensates for any improvements in battery capacity. In contrast, most personal computers are shipped with at least some installed games, quite a few of which have a so-called boss button, which allows the game to masquerade as productivity software whenever somebody in authority comes by and glances at the monitor.

The development of network access via mobile phones can be seen as a step away from the immobility of computing, but capabilities of such systems are severely limited. The

fairly recent fiasco of the Iridium chain of commercial telecommunications satellites (which was supposed to provide the first truly global mobile phone network) means that physical geography continues to be an important factor in the distribution of cyberspace. It also seems like yet another sign that relocation into outer space is no longer able to flare up general enthusiasm (and, in this case, willingness to purchase services) on the order experienced at the height of the space race in the 1960s. In William Gibson's most recent book, *All tomorrow's parties* (1999/2000) the person's physical location bears no relation to his/her position, capabilities, and status in cyberspace. One of the main characters, Laney, oversees a world-altering secret operation while squatting in a cardboard box on a Tokyo underground station. The fact that he is terminally ill, very weak and close to dying does not hamper his activity. The situation has both similarities and strong differences with the plot of *Neuromancer,* written over 15 years earlier. In the 1984 book, Case needed a healthy body to navigate the bodiless consensual hallucination of cyberspace. His (and other characters') actions, taken in physical space as well as in the virtual reality allowed an artificial intelligence (AI) to freely roam the data realms. In *All tomorrow's parties,* Laney is close to dying, but nevertheless manages to help Rei Toei (another AI) to pass into the physical space and gain a fully functional corporeal body in the process.

On the one hand, the newer novel's center of gravity seems to have moved towards the physical space, on the other, the physical world's influence on the virtual realm no longer seems as strong as it used to be in *Neuromancer.* The interplay and the changing relationship between the two spaces brings me right to the topic of boundaries, boundary crossing, and liminality, one which I shall take up in the next chapter.

Chapter 5: Rifts and boundaries

In the previous two chapters, I have explored the representation of and critical reflection on physical space and cyberspace as these two concepts form an obvious point of departure for the study of spatiality in relation to computers. But my ability to distinguish between these two terms relies on the assumption of the existence of a boundary separating the corporeal from the virtual. Indeed, this very boundary constitutes a recurring theme of this work, and thus needs to be explored in some detail. So far, I have largely accepted the idea of a boundary as a rift separating disparate concepts and spaces. However, the difficulties present in distinguishing spaces from places, physical manifestations from virtual images, and order from disorder all hint that defining exact boundary lines might not always be an easy task. After all, geographical boundaries (arguably the most common context of the word) often amount to arbitrary lines drawn on the map that have no direct counterpart in the mapped terrain.

Thus, my next step in examining the interplay between the physical and the virtual involves looking more generally at the idea of a boundary, and particularly at its instantiations pertaining to the issue of spatiality. I shall also attempt to analyze not only the creation and erection of such obstacles, but also the manifold ways in which they are bridged, crossed, and subverted. By looking not only at a single dividing line, but at many different culturally significant borders, I hope to provide background for researching the interplay between the corporeal and the virtual as evidenced by my field material.

Boundaries in fiction

I shall begin the exploration by turning towards the images presented in science fiction literature and cinema where boundaries and various ways of crossing them tend to feature prominently. One classic theme present throughout the whole history of the genre is

interplanetary travel. In what is often considered the first science fiction movie ever, *A trip to the Moon (Le voyage dans la Lune)*, George Méliès (1902) told the story of a group of scientists leaving Earth and travelling to the surface of its satellite (and back). Herbert George Wells' novel *War of the worlds* (1898/1958)—another early classic—involved aliens travelling from Mars to invade our planet. Countless other works of that genre described journeys to different worlds, often accompanied by exploration, and this theme's roots can be traced to the geographical narrative of nineteenth (and early twentieth) century adventure novels, the genre very well analyzed in Richard Phillips' *Mapping men and empire* (1997). Yet while there are considerable similarities between the journeys of high adventure heroes and those of starfarers, there are also differences considerable enough for me to concentrate only on the latter. Most importantly, the transition between the known and the unknown spaces tends to be much smoother in the adventure genre: although islands and even continents can be considered distinct and bounded entities, these boundaries are usually softened by the existence of borderline spaces such as the coastal city. Strange planets from science fiction narratives are, on the other hand, presented as much more sharply delimited than continents or islands, and so leaving Earth constitutes a significantly stronger boundary-crossing experience than leaving one's homeland ever does. Thus, in Robert Louis Stevenson's classic adventure tale, the path to the *Treasure island* (1883/1994) leads through the liminal space of the bustling port city of Bristol:

> Though I had lived by the shore all my life, I seemed never to have been near the sea till then. The smell of tar and salt was something new. I saw the most wonderful figure-heads, that had all been far over the ocean. I saw, besides, many old sailors, with rings in their ears, and whiskers curled in ringlets, and tarry pig-tails, and their swaggering, clumsy sea-walk; and if I had seen as many kings or archbishops I could not have been more delighted (p 46).

This is a place where the familiar blends with the foreign, where the known and the unknown overlap. In Henryk Sienkiewicz's *In desert and wilderness (W pustyni i w*

puszczy, 1912/86), probably the most famous Polish work of geographical adventure, the heroes experience of the wild Africa begins with Port-Said and Cairo—civilized (i.e. presented as civilized in the narrative), that is firmly under British control, outposts in Africa—pockets of Europe, mediating the experience of entering a strange and unknown continent.

Sharp limits

Science fiction novels typically offer much more abrupt shifts between different spaces. A telling early example comes from Edgar Rice Burroughs' *A princess of Mars* (1912/90), written in the same year as Sienkiewicz's story. Burroughs, besides writing science fiction, was also a prolific author of adventure novels, most notably the *Tarzan* series which has enjoyed numerous screen adaptations. In *A princess of Mars,* John Carter, the protagonist, travels to Mars using mostly his own power of will and longing as a means of transport. The first chapter of the novel ends with the protagonist leaving Earth:

> I closed my eyes, stretched out my arms toward the god of my vocation and felt myself drawn with the suddenness of thought through the trackless immensity of space. There was an instant of extreme cold and utter darkness (p. 20).

and the next one begins with his arrival on Mars:

> I opened my eyes upon a strange and weird landscape. I knew that I was on Mars; not once did I question either my sanity or my wakefulness. I was not asleep, no need for pinching here; my inner consciousness told me as plainly that I was upon Mars as your conscious mind tells you that you are upon Earth. You do not question the fact; neither did I. (p. 20)

I have already mentioned *A trip to the Moon,* the early cinematic masterpiece. It consists of fifteen scenes played out in fourteen minutes, but only two of the shots deal with the actual extraplanetary journey—the rest take place on the surface of either the Earth or the Moon. A much more recent example, the 1986 film *Aliens* by James Cameron treats space

travel in a remarkably similar way, even though the boundary itself is drawn slightly differently—planetary space includes the planet's orbit, and only leaving orbit constitutes boundary crossing. Thus, early scenes take place interchangeably on Earth orbit and surface, then a very brief transition shows a spaceship emerging from the journey to another planet, and the rest of the film takes place in the new planet's vicinity.

The plot of *Aliens* actually capitalizes on its extension of planetary space to include the globe's orbit—near the end of the film Ellen Ripley, the heroine, escapes from a planet's surface into an orbiting spaceship; the scene is presented as a retreat into safety from the monsters found on the ground. Upon arrival, however, she discovers that an alien creature has managed to get onboard the spaceship. Only after killing it can she truly leave the horrific planet, that is slip into hibernation as the ship enters hyperspace on its way back to Earth.

Thus, there are two spatial boundaries being crossed at the end of the film—between the alien planet and Earth, as well as between "normal" space and hyperspace. The existence of the latter is common enough in science fiction worlds—a space outside the realm of Newtonian (or Einsteinian, for that matter) physics, called alternately hyperspace, warpspace, or subspace, which allows for faster than light travel. What is interesting here is that there is almost always a distinct and noticeable point of transition between the two spaces. Experience of the actual shift may vary—it can, for example, produce feelings of nausea (Weber, 1993/2000) or distortions in perspective perception (Simmons, 1989/94). In case of the film *Aliens,* the transition (or perhaps the whole experience of hyperspace) seems totally unbearable for human beings who need to be symbolically taken out of their usual spaces and put in "hibernation chambers." Peter Hamilton (1996/7) describes yet another version of hyperspace boundary, this time described from the outside observer's point of view:

> Space outside the attack cruiser *Beezling* tore open in five places. For a moment anyone looking into the expanding rents would have received a true glimpse into empty infinity. The pseudofabric structure of the wormholes was a photonic dead zone, a darkness so profound it seemed to be spilling out to contaminate the real universe (p. 1).

Regardless of the details of the shift's experience and appearance, it is almost universally presented as abrupt and momentary, and in this way similar to the usually sharp boundary between the planets conceived as discrete bodies.

This is not to imply that sudden shifts of perspective are never even foreshadowed, and that leaving Earth is always synonymous with crossing a significant boundary between worlds; in Stanley Kubrick's 1968 film *2001: A space odyssey* the hero's journey from Earth to Jupiter orbit is clearly analogous to the liminal space of the coastal city—it prepares him for the wondrous and terrifying experience of the climactic scene of landing on Jupiter. In Samuel Delany's (1966/81) *Empire star* there is even a spaceport described in the terms reminiscent of that of the coastal town. In this case, however, the transition to a foreign space fails to arouse awe in the unprepared hero (which it did in *Treasure island)*—his limited vocabulary cannot cope with interpreting the unfamiliar sights:

> He had never done more than look through the second gate at the bulbous forms of the ships. at the loading buildings, at the mechanical loaders and sledges that piled the pathways of the Transport Area. When he stepped through, he looked around, waiting for the world to be very different.... But his conception of *different* was rather simplex[10], so that twenty feet along he was disappointed (p. 113-114).

In the story that follows, Delany's hero discovers both the wonders of space travel (and other planets) and the language needed to describe it, thus simultaneously transgressing a spatial and a cultural barrier.

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[10]Delany uses the words *simplex, complex,* and *multiplex* to denote different levels of appreciation of the existence of other cultures and points of view — JK

Moving between worlds

But outer space is not the only source of significant spatial boundaries in the narratives of the fantastic; another motif quite frequent in this genre concerns travel between different realities or dimensions. And of course as soon as multiple worlds appear, the issue of their separation follows. In much the same vein as planets, alternate realities tend to be depicted as distinct and bounded entities, not meant to coexist in the same space as any other one. Consequently, crossing over amounts to an abrupt change in one's surroundings, often accompanied by loss of consciousness (e.g. Moorcock, 1995), a period of sensory deprivation (Donaldson, 1977/8), or altered perceptions (Zelazny, 1970/2). None of these transitions feature a merging of the two realities involved; rather, like the sea journeys of the explorers from adventure stories, the passage is represented as time spent outside the usual setting, joining two distinctly separate realities.

When realities do overlap, as they do in many of Philip K. Dick's stories, such situation is seen as unfortunate, and the protagonists strive to remedy it. In his *A Martian time-slip* (1962/94), for example, a few characters perceive glimpses into another reality superimposed over the familiar world they are used to living in. While the other reality, full of decaying steel hulks of ruined skyscrapers is depressing in itself, the mingling of worlds adds greatly to the despair of the protagonists.

Another common science fiction trope involves describing only a single reality, but one which is posited as forming a double with our own world's history. Thus, in Philip K. Dick's (1962/91) *Man in a high castle,* the Axis countries have won World War II and Japan annexed large parts of North America; in William Gibson and Bruce Sterling's (1991) *The difference engine,* Charles Babbage perfected his mechanical proto-computer, and Britain has plunged into the information age during the steam-driven nineteenth century. As Francis Spufford (1996/7) points out, many of these stories allude to our own world

through characters who sense some kind of wrongness about their version of history. In *The difference engine,* such realization takes form of a minor character complaining "that some dire violence has been done to the true and natural course of historical development" (p. 301). In the *Man in a high castle,* the protagonist comes to a similar conclusion through consulting *I-Ching.* These stories speak of uncrossable rifts between the worlds, as alternate realities can be sensed, but not travelled to.

Mythology and purity

The narrative of this chapter will bring me back to the exploration of science fiction, but the topic of travel between worlds demands further elaboration, as it is important to note that it is by no means solely restricted to the contemporary genre of the fantastic. Various mythologies, non-science fiction literature, and visual arts all offer examples of journeys to and from other worlds that by far predate any of the narrative I have examined here. Already in *Gilgamesh,* the oldest recorded epic, Enkidu, the title character's companion, recounts his experiences in the underworld. Medieval literature is full of *visions,* that is accounts of spiritual journeys into hell, heaven, and purgatory (for an overview, see e.g. Minois, 1991/6; Delumeau, 1992/6), with Dante's *Divine comedy* forming the less religious and more literary pinnacle of this genre. The case of purgatory is particularly pertinent, as it can be seen as a liminal space in itself, located in between hell and heaven. Accordingly, its acceptance was very problematic; not only was it a hotly debated theological topic ever since its first appearance in the XII century, but it was also condemned by the Protestants, disapproving of such "invented otherworld" (Le Goff, 1981/97).

Margaret Wertheim (1999) argues that medieval paintings depicting afterlife served a similar function as gateways to other worlds. Yet it is mythology that seems most pertinent to the present subject of boundaries; Edward Casey (1997) shows that the original act of

creation as presented in numerous mythologies, including *Genesis*, is essentially an act of separation—in *Genesis* light is segregated from darkness, water from land, and sweet water from the seas. If the whole creation hinges on separating diverse elements, it only follows that keeping them apart is perceived as a top priority. This is consistent with the reading of *Leviticus* proposed by Mary Douglas in her *Purity and danger* (1966/84). In *Leviticus,* certain animals such as camels or swine are designated as unclean abominations, that is both unsuitable for eating and also polluting whoever comes in contact with them. Douglas interprets these laws as stemming from the desire to classify, to erect and maintain sharp boundaries, to preserve purity—the unclean animals are the ones which defy classification (according to the criteria endorsed by *Leviticus*), transgress boundaries, and pollute clean categorizations. In the case of swine and camels, the violated category groups ruminants, described as cud-chewing animals with cloven hoofs. Camels chew the cud but were seen as odd-toed, while swine are even-toed, but are not ruminants. Both defied classification and so both were considered unclean.

Douglas goes on to argue that purity is closely linked to the sphere of the sacred, while impurity and transgression represent not only the profane, but also the mystical. The priest, personifying the divine order, is thus seen as a lawgiver enforcing separation of different categories, reenacting the original setting apart that comprised the act of creation. The shaman, on the other hand, embodies the profane and the forbidden, crosses boundaries and meshes different orders, offers links to the mystical universe beyond the material world. The shaman thus embraces liminality, but is a figure largely excised from the Western civilization. Both the priest and the shaman partake in the worship of the divine, the former representing the sacred, the latter the mystical.

The cult of purity is not, however, limited to the realm of religion, nor is it relevant only to the ancient times. Similar ideas proliferated in many modern discourses, most notably those of science and social order:

> The way to progress led through differentiation (usually dualist in character) and through purification of the categories thus created: nature-culture, private-public. Mixtures were seen as the errors of logic, as an intrusion of chaos upon the realm of order, and, in a more emotional vein, even as 'pollution' and 'transgressions' that ought to be punished—literally or metaphorically (Czarniawska, 2002: 147)

As usual, however, the laws of separation do not offer the complete story. Bruno Latour, in his book *We have never been modern* (1991/3), describes an underlying trend running contrary to the official pronouncements. For while the dominant discourse of modernity preached strict separation of the social from the natural, numerous practices not only allowed, but also required constant mingling between the supposedly separated realms. Science could claim access to unmediated facts while at the same time engaging in constructing and anchoring these very facts in the fabric of socio-technological networks. The facts appear to be excluded from social relations while at the same time drawing rhetorical power from these very relations (which need to be recast as socio-technological however, to allow the inclusion of facts in their midst). The canonical example of such a strategy has been described by Shapin and Schaffer (1985), and regards Richard Boyle's seventeenth century experiments with air pumps. Boyle, providing a template ever repeated by the modern science, attempted to reduce the complex dispute regarding the possible existence of vacuum to a mere technical question solved, in the presence of respectable witnesses, by the use of technology. Thus Boyle at the same time wove together a network consisting, among others, of cutting-edge technology (the air pump), social hierarchy (determining who counts as a respectable witness), and asphyxiating birds, and reinterpreted it as natural phenomena making themselves transparent to the inquiring mind. Both the overt division and the unacknowledged coupling added to the credibility of Boyle's arguments, and both processes were instrumental in the emergence of the modern world; traces of both can still be witnessed today.

Advantageous as such a strategy may be, it is a very dangerous one. The discourse of purity is always a discourse of exclusion, and thus discriminatory to those who do not fit predefined categories. Gibson Burrell's (1997) *Pandemonium,* a book portraying the dangers of rampant rationality, is clear on the consequences of overly neat divisions—they are an instance of linear thinking, that is of ignoring subtleties of the surrounding world in the desire to simplify and to control; the oft repeated message of the book is that quite literally, LINEARITY KILLS. Only openness to the complexity of the reality we inhabit—indeed, to its impurity, or messiness—gives some hope of avoiding the murderous pitfalls of linearity. The Holocaust (Bauman, 1989/91; Law, 1994) can be seen as an archetype of a fully rational (and linear) undertaking, carefully controlled through bureaucratic means and duplicating the cool efficiency of a railway timetable (as well as utilizing the railroads network to optimize mass murder); it was also an attempt at attaining an ideal of purity—the purity of the Aryan homeland.

Nowadays, order (which always relies on separation of the allegedly dissimilar) is still almost universally regarded as a positively valued notion; I have already noted that even proponents of chaos theory and of anarchy are usually very keen to insist that the concept they cherish has nothing in common with disorder (Kociatkiewicz and Kostera, 1999). Neither is the idea (and the ideal) of purity particularly new—as Jan Nederveen Pieterse (2001: 226) puts it, "since time immemorial the dominant idea has been that of pure origins, pure lineages," even though no lineage and no origin ever lived up to that claim.

Hybrids

Yet to excise all order and all ordering on the basis of the problems and the dangers they pose is not a viable solution; not only because of the multiplicity of standards and classifications already present in contemporary life, but also because they are there for a reason. The simplest explanation is that

> [t]o classify is human.... We all spend large parts of our days doing classification work, often tacitly, and we make up and use a range of ad hoc classifications to do so. We sort dirty dishes from clean, white laundry from colorfast, important email to be answered from e-junk (Bowker and Star, 1999: 1-2).

In other words, ordering and classification are crucial techniques for adding meaning to the world we live in. Categorization is a creative activity, and the creation that it involves is the creation of order. Such ordering is never complete, categories turn out to overlap, or multiple and mutually exclusive classificatory demands are brought to bear on the same object. Interpretation is also needed to implement a ready-made ordering system, as Brunsson and Jacobsson (2000: 129), writing about standards, attest:

> [I]t is generally difficult to do exactly what a standard says. The standard is general and abstract, whereas operations are always specific. Practicing a standard is mostly about adapting practice so that the standard describes it with reasonable accuracy.

Standards are ordering systems specifically prepared for their wide applicability in different settings, but even very concrete classifications never fulfill the ideals of internal consistency, exclusivity of categories, and completeness in ordering their subject matter (Bowker and Star, 1999). Thus the world becomes populated with hybrids—transgressive couplings spanning over carefully delineated boundaries—that refuse to be classified, or which throw classificatory systems into confusion. John Law (1991) dubs them "hopeful monsters," stressing both the promise of unity they offer and the abomination of disregarding the established order.

The issue of hybrids is an important one, pertaining to the apparent chasm between the physical and the virtual—the one I am most concerned with in this work—just as much as it does to the purity of food and to the roots of modernity. Although much has been made of the connection between postmodernity and the disappearance of fixed boundaries (e.g.

Harvey, 1990; Bauman, 1991), this is by no means a strictly recent phenomenon (although it can be argued that is has lately become more pronounced, or at least more noticeable). It has not only occurred, but also been recognized for ages, although, as there are ample reasons to wish for clear-cut divisions, the dominant powers tended to reinforce rather than question boundaries (Bowker, 1998). This means that both the power-backed discourse of purity and the subversive hybridity it invites have been present and recognized for a long time. Indeed, the notion of hybridity makes sense only in opposition to the essentialist boundary-making, for

> [h]ybridity as a point of view is meaningless *without* the prior assumption of difference, purity, fixed boundaries. Meaningless not in the sense that it would be inaccurate or untrue as a description, but that, without an existing regard for boundaries, it would not be a point worth making. Without reference to a prior cult of purity and boundaries, a pathos of hierarchy and gradient of difference, the point of hybridity would be moot (Nederveen Pieterse, 2001: 226).

Currently, however, this is not an issue, as

> [t]here is plenty of essentialism to go round. Boundary fetishism has long been, and in many circles continues to be, the norm (ibid.: 224).

There are, therefore, some serious limitations to understanding hybridization as merely the abolishing of established boundaries, though. It forms a viable political position, but it does not help much in understanding the processes involved. If, following Latour, one agrees that erecting and demolishing barriers are two sides of the same activity, it seems more useful to define hybridization as denoting the whole process of establishing, defending, as well as transgressing categories. Boundary setting emerges then not as a prior act preparing ground for subsequent boundary violation, but as coexistent with various ways of ignoring the barriers that are being defined. Hybridization understood as the multiple processes taking place around and in relation to boundaries is what Barbara Czarniawska invokes when she suggests:

> Instead of lamenting over the deficiencies of classification, one should pay attention to the process of hybridization in order to better understand its course and imagine its possible effects (Czarniawska, 2002: 147).

Merits of boundaries

This redefinition brings me back to boundaries which always lie at the center of the manifold processes of hybridization. A similar conclusion is reached by Jan Nederveen Pieterse, who asks:

> if all cultures are hybrid all along, then the problem is not hybridity but boundaries: how is it that boundaries are historically and socially so significant? (2001: 230)

Part of the answer has already been explored here. Boundaries allow for the representation of the sacred, even as the mystical experience requires hybridization. They are an important tool for making the world intelligible, and are a powerful rhetorical device, especially when coupled with transgressive hybrids. But perhaps foremost boundary-making is an instrument of discipline, the exercising of classificatory power. When Michel Foucault describes what he calls the "disciplinary machinery," that is institutions such as prison, army, school, or hospital, designed to punish, control, and/or reform the unruly, he presents them as classificatory apparatus:

> [Disciplinary] machinery works space... on the principle of elementary location or *partitioning,* Each individual has his own place; and each place its individual. Avoid distribution in groups; break up collective dispositions; analyse confused, massive or transient pluralities.... Discipline organizes an analytical space (Foucault, 1975/91: 143; original emphasis).

To discipline is thus to perform a spatial categorization and vice versa: to classify is to employ power to discipline the social actors subjected to classification. But it is also useful to look at the notion of space Foucault uses in this context:

> In discipline, the elements are interchangeable, since each is defined by the place it occupies in the series, and by the gap that separates it from the

> others. The unit is, therefore, neither the territory (the unit of domination), nor the place (unit of residence), but the *rank:* the place one occupies in a classification, the point at which a line and a column intersect, the interval in a series of intervals that one may traverse one after the other (ibid.: 145-146; original emphasis).

In this sense categorization is always a spatial activity, utilizing a special kind of space—"serial space" (p. 147), idealized in the tabular form of rows, columns, and cells. As there is no place and no territory, serial space is given meaning only through the divisions erected to separate the cells—ranks can be ascribed only while accompanied by some perceived difference. The divisions, or boundaries, representing this difference need to appear impregnable, as any ordering system relies for its stability on the stability of the differences it takes as its basis. In contrast, narrativization, another important sensemaking tool, is an inherently temporal activity, relying as it does on establishing the sequence of events.

It is easy to identify numerous lines of division in the contemporary society that require constant construction of difference to sustain their preeminent position—for example gender, nationality, and class all form important lines of division that are not at all obvious if one does not follow the dominant discourse describing them. While it is beyond the premise of this work to examine the topic of all socially constructed stratifications and their consequences, there remains a related question that might shed some light on the issue of spatial boundaries—how are the apparently unbridgeable rifts constructed and maintained?

Crossing rifts

Gender has probably been the most widely discussed, both in the popular and in the academic discourse, social institution that once appeared both completely natural and unchangeable, but which has begun to be called into question (social class being another strong contender). It is thus no longer shocking to hear that "one is not born, but rather

becomes, a woman" (de Beauvoir, 1949/72: 295), or even the assertion that gender has no biological basis whatsoever (Whitehead and Barrett, 2001). At the same time,

> children learn to take up their maleness or femaleness as if it were an incorrigible element of their personal and social selves... they do so through learning the discursive practices in which all people are positioned as either male or female (Davies, 1989: X).

Such statement, however, begs the question as to what kinds of discursive practices are capable of bringing about such a positioning. David Morgan's study of masculinities[11], *Discovering Men* (1992), explored various dualisms used to distinguish maleness from femininity. One of them actually corresponds to the clean/dirty opposition described by Mary Douglas, but other sharply delineated dichotomies, such as heavy/light or dangerous/harmless, are also used. Quite predictably, all of these distinctions are ultimately mapped onto the opposition between the male and the female, which is made to seem significantly more formidable for encompassing all these presumed differences. When dichotomies are used in such large numbers, it becomes unimportant if any one (or even all, as the case may be here) binary opposition is simplified, inaccurate, or downright silly—what matters is that together they form a strong picture of polarity. Even if one can argue that women are not generally (or naturally) more talkative than men (as the gender stereotype in Poland suggests), they can still be considered diametrically different from men because they are also (perceived to be) weaker, less aggressive, more emotional, and generally disparate in a thousand of diverse ways. Disproving any one difference does not prove much, and disproving all of them becomes a Herculean task.

This is not to say that the whole issue of gender is reducible to such process of constructing differences—there is the whole process of cultural learning, as mentioned by

[11]The convention of using that word in plural, common in the contemporary writing on the male gender (e.g Brod, 1987; Connell, 1995), is used to stress that there is no single masculinity, but a number of different constructions and understandings of what it means to be male.

Davies, at hand to perpetuate the distinction, as well as the issue of enacting the constructed dichotomies. Nevertheless, the process of conflating a large number of different distinctions into one monolithic boundary reveals a significant characteristic of many formidable barriers—they are not homogeneous, but instead consist of numerous smaller obstacles cobbled together.

Another lesson in crossing boundaries comes from the field of the philosophy of science. There one encounters the idea of incommensurability of paradigms, that is the impossibility of overcoming differences in mindsets peculiar to particular scientific[12] communities. The concept stems from Thomas Kuhn's (1962/8) analysis of scientific progress and Paul Feyerabend's (1975/94) exploration of the limitations of Western science (masquerading as universal rationality), as well as from Ludwig Wittgenstein's (1922/92) famous dictum "the limits of my language mean the limits of my world." Briefly speaking, the notion assumes different worldviews to be largely complete systems that, without direct recourse to the outside reality,[13] cannot be harmonized with any competing system. Change in a worldview has to be a very disruptive event, as it entails replacing one system with another, rather than just incorporating elements from another paradigm. Indeed, such a change is possible only because paradigms never manage to become all-encompassing; experiences unexplainable or indescribable within a given worldview force the social actors to discard one paradigm in favour of another one. The problem of overcoming incommensurability appears in every attempt at any sort of translation—no discourse can remain unchanged when transposed into a different language or even a different medium. Michel Serres (1982; see also Brown, 2002 for a discussion of Serres'

[12]The insight is not limited to scientific communities, though, and Paul Feyerabend's use of the notion of incommensurability is much broader, encompassing the problem of communication between different cultures rather than just between actors within the scientific culture.

[13]Even if one assumes that such reality indeed exists. As Richard Rorty (1980/94) points out, this is a largely aesthetic choice, as there is no possibility to actually experience it, short of, perhaps, a mystical experience (Kostera, 2003).

stance) emphasizes this issue, depicting all acts of communication and invention as instances of translation. In the context of new media, Marshall McLuhan famously declared that "the medium is the message" (1995/2001), i.e. mode of communication is largely responsible for the meanings derived from any message. The anthropologist Ruth Behar, reflecting on the difficulties in presenting research conducted in another language, recalls the well-known adage that every act of translation (*traduction*) is an act of betrayal, misrepresenting the field and doing violence to the original story (1993). Ironically, the adage itself has at its root an error in translation: George Steiner reports that

> Romance languages derive their term for "translation" from *traducere* because Leonardo Bruni misinterpreted a sentence in the *Noctes Atticae* of Aulus Gellius in which the Latin actually signifies "to derive from, to lead into" (1975/92: 311).

The writer Eva Hoffman, recounting her experiences of immigration and bilinguality (1989/95), echoes the fear of translation, recalling being forced into another language as a hurtful experience leaving scars upon her being. At the same time, various translations thrive all around us: texts are translated into different languages, books are translated into films and vice versa. The field research for this thesis was conducted in Polish and translated into this English text. Yet I don't think this invalidate the misgivings such as those of Ruth Behar (who, regardless of the vicissitudes involved, turned her Mexican ethnography into a book in English) or Eva Hoffman (whose book I read in a Polish translation). Instead, all these translations show that it is impossible to avoid translating, nor to avoid the dangers associated with it. Crossing the boundary separating different languages, different media, and different discourses is possible (and necessary), but never without changing the original message.[14] Communication is a precarious activity, but this

[14]Existence of the original message is itself suspect—listening, or reading, is always a creative act of interpretation; the message arises in the course of interaction between the author, the text, and the reader (cf. Eco, 1962/89; Barthes, 1977).

does not stop us from engaging in it. Paul Feyerabend, writing some 15 years after the publication of *Against Method,* the book in which he expounded his concept of incommensurability, commented that the whole notion has been blown out of proportion; he warned against seeing unbreachable obstacles in what was basically an inconvenience, and urged his readers to try and communicate with those embracing different paradigms in spite of the difficulties such interaction presents (1989/91). Thus, it is possible to view translation in a much more positive light—although it invariably fails as a vehicle for propagating ideas seen as immaculate objects, unchangeable and unanchored in their context, it often succeeds in expanding the ever-changing networks of social communication. Indeed, Bruno Latour (1987) proposes to view all social contact as translation. Such stance underscores the agency and creativity inherent in all interaction. Social actors affect everything they come in contact with, interpreting (the word, in one of its meanings, is a synonym of translating) as well as relaying objects, messages, and ideas. Granted, Latour is keen to stress that his understanding of translation goes beyond the purely linguistic definition, but perhaps here too it might be fruitful to use the broader meaning of the term—after all, crossing spaces always entails some sort of movement, and it is spatial boundaries and hybrids that interest me the most in the context of this work.

City space

As I have argued in the previous chapter, the new technologies tend to inhabit urban space. The city, with its rich lore of spatial organization, provides some intriguing insights regarding rifts and barriers. Kevin Lynch (1960), in his typology of topological forms useful for describing city space, writes of edges: boundaries delimiting particular areas, safeguarding the uniqueness of individual stretches of urban space. But a city is not just landscape—it exists only as it is lived in, and can be described only in relation to the practices of its inhabitants; an attempt to portray it as a static form is doomed to failure. Edges, thus, exist only insofar as they are performed. A change in practice can redefine an

edge as a connection, or wipe it out completely. Boundaries, even those literally set in stone, are ever fluid and liable to change.

The city as a whole can also be conceptualized as representing unity or disparity. For Scott Lash, the two models of city space, the classical (or humanist), and the gothic represent these two poles of urban organization. The humanist city is the one of harmonious union, subordinate to the power of vision and the laws of perspective, while the gothic landscape disrupts this overarching principle, positing contradiction and difference in place of unity and harmony.

> [I]t would seem to me... that vision, and the assumption of perspective and the eye of the viewing individual, is the organizing principle, perhaps less of modernism than of humanism. And in this sense the Gothic would be the supreme ideology to counter the culture of vision. The gothic runs counter to the visual regime in its opposition both to symmetry and to light or clarity (Lash, 1999: 71-72).

In a subtle reversal, this time it is unity and homogeneity, rather than sharply defined boundaries, that represents overarching order. But the attributes of power remain unchanged: cleanliness, symmetry, and linearity. For it is not so much the idea of differentiation as that of eliminating anomalies that drives the project of ultimate ordering. Lash couples it to vision, and indeed it brings to mind Michel Foucault's retelling of Jeremy Bentham's project of the ultimate prison: the Panopticon, where the power of invisible watcher serves to pacify unruly prisoners. In fact, the jailer is deemed superfluous; the prisoners internalize the disciplinatory gaze, ultimately becoming their own jailers and total homogeneity can be realized in the dream of perfect order.

The gothic city, with its labyrinthine alleyways discounting the power of vision, provides the emblematic example of disorderly space, fragmented and differentiated into numerous quarters. It is rife with numerous boundaries, but it represents lived practice rather than an exercise of city planning. Gothic space is created by its inhabitants rather than being aimed

at the visitor, like the humanist city is. It needs to be experienced rather than observed. Gibson Burrell's imagined city of Pandemonium, as presented in the book of the same name, is the ultimate realization of the gothic principle. Even though ostensibly presented as a series of exhibits, it gives impression of a maze-like structure (helped by creative ordering of the text, running in both directions over each page). It invokes all senses, and is never shown in its entirety; the reader can explore its specific instantiations, but never examine the whole space at the same time. Most importantly, it symbolizes the repressed anomalies, the insights and experiences written out of the sanitized and linear discourse, much as gothic space houses the unsightly hybrids banished from the carefully planned perfection of the classical city.

Yet another spin on the association between city space and boundaries is Joel Garreau's (1991) description of what he calls Edge Cities—newly emerging city centers, which he feels embody ideas of the future. Each of them and all together are understood to constitute a border, imploding the whole city into a boundary. This description also evokes the American conservative myth of the frontier—empty, untamed land awaiting courageous settlers to whom it promises untold riches. The same myth is invoked by John Perry Barlow, who speaks of cyberspace as the electronic frontier. In this case, virtual reality is presented as a land suitable for colonization, though it is not clear if such colonization would entail leaving one's previous place of residence. Everyone is free to enter the land of opportunity,

> without privilege or prejudice accorded by race, economic power, military force, or station of birth (Barlow, 1996, unpaginated)

The reference to American history is further emphasized by titling the text "A declaration of the independence of cyberspace." Significantly, though not surprisingly given the myth's origin, gender discrimination does not appear among the suggested prejudices that need to be abandoned before settling on the new frontier. Symbolic connotations of

Barlow's manifesto are very similar to those invoked by Garrou, except, of course, for virtuality of the new settlements.

The discursive similarities between the virtual and the physical would not surprise Jean Baudrillard. In his opinion, the important boundary—between the real and the hyperreal has already been crossed (1995/6). In all our experiences reality has been effectively replaced by hyperreality and not many people even noticed. Indeed, the disposal of reality is supposed to have been "the perfect crime"—stealthy and committed without leaving any evidence, for no traces of the real remain to be examined. There is no return to the pre-hyperreal state of innocence; the transition is irreversible and irrevocable.

But despite Baudrillard's invoking of a very wide range of phenomena, from pop art to mass media to commodity fetishism (as well as, of course, technology) as illustrations of his thesis, it is tempting to map his distinction directly onto the interplay between the physical and the virtual. Hans Moravec (1998), an artificial intelligence specialist, envisions ultimate fulfillment of Baudrillard's vision in the form of migration into cyberspace, accomplished through destructive scanning of the subject's brain structure; the subject's brain is to be encoded, cell by cell, into a computer, even as the original brain is being destroyed in order to expose successive cell layers. Other enthusiasts of the virtual worlds tend to predict more or less frequent travel to and from cyberspace (Holtzman, 1997) or the mingling of worlds through superimposition of virtual patterns over everyday objects (Billinghurst and Kato, 1999). But to gain an understanding of the different visions of the boundary between the physical and the virtual, one can turn once again towards science fiction narratives. Here, it is the cyberpunk genre that provides the richest source of inspiration.

Bodies in virtual spaces

Cyberspace tends to be very strongly separated from the physical world, particularly in the early cyberpunk works. The two spaces share no overlap or boundary area. Similarly, the user's consciousness is at any given time firmly located in either one space, or the other. Transition is almost instantaneous, if often somewhat disorienting.

> The screen bleeped a two-second warning.
> The new switch was patched into his Sendai with a thin ribbon of fiberoptics.
> And one and two and—
> Cyberspace slid into existence from the cardinal points.
> Smooth, he thought, but not smooth enough. Have to work on it.... (Gibson, 1984: 55-56)

To participate in such experience, one often needs special neural implants (e.g. Piercy, 1991/2; Shirley, 1989/91), as well as a physical connection to a computer which in turn connects to the network. Virtual reality can thus be restricted to those who are eager or desperate enough to undergo drastic medical treatment in order to participate. In later fiction (mostly from the 1990s), the strict boundary between worlds tends to be softened somewhat. Neal Stephenson's *Snow crash* is a case in point. Here is a description of the main character's location in Reality (his term):

> So Hiro's not actually there at all. He is in a computer-generated universe that his computer is drawing onto his goggles and pumping into his earphones. In the lingo, this imaginary place is known as the Metaverse. Hiro spends a lot of time in the Metaverse (Stephenson, 1992/3: 22).

The journey (or actually teleportation) into the Metaverse involves mediation of the sensory input by the character's body. Sound, provided through earphones, requires Hiro's ears in order to become audible; image, projected onto his retinas via high-tech goggles, needs his eyes for it to become visible and meaningful. Other senses: touch, smell, taste, and balance are all absent, apparently not required for telepresence. Paradoxically, the technology connected to and interacting with Hiro's body allows for the subject's removal

from the very body upon which it is centered—Hiro is not at all *there,* that is *in* his body. For the body in the above quote acts as a mere container, or perhaps abode, for the subject who is liable to enter and leave it at will. At the same time, Stephenson shows telepresence as involving not just transporting the user from corporeal space to cyberspace, but also as a meshing of different spaces, or at least as giving the user the ability to appear in two spaces at the same time. Thus, Hiro is one of the few cyberpunk protagonists who consciously exist in both the virtual and the corporeal space simultaneously, sharing his attention between Reality and Metaverse:

> Hiro's avatar stops moving and stares at her, adopting just the same facial expression with which he used to stare at this woman years ago. In Reality, he reaches out with one hand, picks up his beer, takes a pull on the bottle, and lets it roll around in his mouth, a bundle of waves clashing inside a small space (Stephenson, 1992/3: 52).

Splitting one's presence between two different spaces does not happen often, and indeed it barely happens in Hiro's case—he teeters between being in both places at once and venturing completely outside Reality; after all, the reader *is* told that Hiro is not at all there. A more distinct conjunction occurs in John Meaney's *To hold infinity,* where cyberspace exists largely superimposed over the everyday world, providing additional information, more nuanced communication, and easy computer access. It enhances the embodied experience of the world. But when the virtual space is fully immersive, that is it completely replaces the physical world, the protagonist's consciousness becomes completely detached from the body. William Gibson once again provides a paradigmatic example:

> Bodiless.... We're sentient patches of oil swept along down corridors of shadow. Somewhere we have bodies, very far away in a crowded loft roofed with steel and glass (1982/7: 173).

Losing the body is an important part of the transition into the virtual, as is regaining it upon re-entry into the physical space. Conversely, it is the experience of the body that defines the world outside cyberspace. It is not surprising, given the rapture with the virtual that is

one of the defining traits of the cyberpunk genre, that such body is defined by its limitations:

> My eye sockets hurt, so I know I'm not in the system anymore, but where I really am I want to find out without anyone knowing (Cadigan, 1992/4: 100).

In *Neuromancer,* the perfect body is the one that it is possible to leave behind on a trip into the bodiless paradise of the matrix, and consequently, it is not held in high regard by the denizens of cyberspace:

> [T]he elite stance involved a certain relaxed contempt for the flesh. The body was meat (Gibson, 1984: 6).

The exploration of numerous ways in which boundaries are created, maintained, and transgressed

does not lead to any simple answers leads to a few observations about these phenomena. It seems obvious is that clear delineations as well as heinous transgressions are very much social products; both difference and homogeneity exist only in relation to the social practice that supports them. The boundary between the physical and the virtual is similarly difficult to pinpoint—the two can coexist fruitfully in one discourse while remaining incommensurable in another. My task of exploring the interrelations between corporeal space and cyberspace seems likely to involve more than establishing a clear line of demarcation—it is quite possible for the two to merge and overlap rather than stay neatly separated.

Thus a useful distinction to make (establishing another boundary!) would be between a barrier and a rift. The former divides without allowing for liminality, forming a sharp split with no possible overlap between the separated spaces. The latter constitutes a liminal area, as a rift is itself a space: a gap that waits to be filled with meaning. Transgression, and hybridization, thus always deals with rifts rather than with barriers, as does my research—I

am interested primarily in examining the interaction between the various computerized spaces.

The discussion of boundaries has led me to the issue of the human body and its involvement at the boundary between physical space and cyberspace. This comes as no surprise, not only because of the importance of the body for all human experience, but also because

> [t]he body is a model which can stand for any bounded system. Its boundaries can represent any boundaries which are threatened or precarious (Douglas: 1966/84: 116).

For this reason alone the body entails further investigation, and this is exactly what I shall be doing in the next chapter. I shall look not only at the difficulties entailed in treating the body as a bounded system (and thus the difficulties of treating any system as bounded), but especially at its relations with machines, and at the transgressive couplings known as cyborgs.

Chapter 6: Bodies, machines, and their strange couplings

Body and mind

The human body forms a very sensitive topic. Even to mention the body is not only to call up the numerous discourses that have accrued around it over the ages, but to already take a position in regard to defining one's relationship towards embodied existence. Yi-Fu Tuan explains:

> The word "body" immediately calls to mind an object rather than an animated and animating being. The body is an "it," and it is in space or takes up space (1977: 34).

The problem of such stance is that it obliterates the body's role as an agent of experience. As Merleau-Ponty (1945/62) noted, the self is realized only through the body, and thus to dismiss its constitutive role is to grossly distort any discussion of human condition. But regardless of the very real dangers of reification, I think it is necessary to discuss the body's relation to space (much more complex than the quote above would suggest) as well as the extent and malleability of its boundaries. I shall start out by looking at the concepts responsible for the objectification lamented by Tuan. The obvious source of such information is René Descartes, whose visionary ideas were fundamental in establishing the modern concept of rationality. Differentiating between the self (that is: mind and soul) and the body formed the backbone of his philosophical standpoint, and he was very insistent that the two should not be confused:

> Can I affirm that I possess any one of all those attributes of which I have lately spoken as belonging to the nature of body? After attentively considering them in my own mind, I find none of them that can properly be said to belong to myself (Descartes, 1641/1989: 11).

While his is perhaps the most famous exposition of the subject, Descartes' stance has been popular both before and after his time. Scott Lash, for example, describes a very similar concept as a medieval idea:

> For ancient Greek and Renaissance humanists, man is an integral unity of body and soul, whereas the medieval conception of man is just a "clod of earth, miraculously united with an immortal soul" (Lash, 1999: 70).

It is not my goal to attempt finding the original idea that spawned the mind/body dualism; not only is it exceedingly difficult to trace the ultimate source of a popular idea (cf. Merton, 1965/85), but it is also a largely pointless exercise as far as assessing the idea's cultural significance is concerned. While it is convenient to refer to concepts by periods or by proper names, such practice serves a much better function of labelling than of providing historical information. Many contradictory ideas always flourish at the same time, and to choose any one of them as representative of the particular period is to misrepresent the richness of thought of the people living in that age. If a widespread idea is associated with an individual, one can be sure that the name will be used to denote many variants quite different from those endorsed by the supposed author, for the processes of translation are always involved in propagating concepts.

Nevertheless, I shall continue to refer to the mind/body distinction as Cartesian, not so much because it represents a unique point of view of Descartes or even that he was the first to hold it, but because he forms an easily identifiable figure linked to the concepts. Additionally, his *Meditations* provide an excellent and well known exposition of this dualism.

Cyberpunk dichotomies

It is not unusual to find a similar dichotomy in cyberpunk literature and cinema. I have already noted that characters often leave their bodies as they enter the virtual space—in such cases the dividing line between the physical and the virtual corresponds very

strongly to the Cartesian mind/body dichotomy. But an important shift has occurred since the seventeenth century. Descartes speaks of "the machine of the human body" (1641/1989: 39) and considers it very much like a clockwork mechanism, liable to break and malfunction,[15] and generally performing more or less according to the wishes of its handler, the mind. Nowadays, though, machines are often seen not as mere handiwork of skilled craftsmen, but as products of science and technology, both representing rationality. In the end, machines themselves can be perceived as symbols of rationality—Anne Loft (1995) shows how late nineteenth century factory clocks were already often presented that way. Computers, by virtue of being able to perform complex calculations, are particularly liable to be anthropomorphized[16] as supremely rational beings (Prasad, 1995). As symbols of rationality, machines, and especially computers, represent the mind in the Cartesian divide, while the body, soft and squishy, stands for physicality.

The importance of keeping the two apart forms the theme of Richard Stanley's cyberpunk film *Hardware.* The movie takes as a motto the biblical quote from Mark 13:20 (attributed only as Mark 13 in the film): "No flesh shall be spared." While the epigram serves well to illustrate the basic storyline of the movie, involving a murderous robot (later revealed to be a secret government project built in a desperate bid against overpopulation and unemployment) attempting to kill all human beings in its vicinity, it could also be said to describe the film's opposition between the human body and machine parts. *No flesh shall be spared if it comes in contact with technology*. At first sight, *Hardware* shows a lot of mingling and blurring of boundaries between humans and machines—numerous characters feature mechanical body parts, and Jill, the heroine, is constantly surrounded by machines and electronic components. However, as the plot progresses, the technologically

[15]Much of Descartes' interest lay, after all, in medicine.

[16]Note that in this case anthropomorphization involves only the mind and not the body, instantiating the mind/body distinction.

enhanced characters one by one fall victim to the murderous robot: A dealer in mechanical junk, a voyeur seemingly inseparable from his complex surveillance equipment and, most significantly, Jill's boyfriend Moses who sports a cybernetic hand. Indeed, it is the heroine's passion towards machines that leads to her coming in contact with the technological monster. The characters who escape carnage are the ones with the least connection with high technology: An apparently primitive scavenger is the first one to come upon the killer robot, but walks away unscathed after handing it over to an electronic junk dealer. The latter, surrounded as he is by machines and circuitry, falls victim to the destructive machine. A motorboat cab driver, who uses an old-fashioned radio to play old-fashioned music, but no advanced technology, survives unharmed. Finally, Shades, who seeks entertainment in drugs rather than in interaction with machines, also manages to stay alive. Against this background, Jill's story can be seen as one of growing emancipation from the technology attempting to consume her. Her survival hinges on her ability to distance herself from machinery, to draw a firm boundary between herself and the robotic Other.

What is interesting in regards to the present discussion is that *Hardware* shows technology as pervading the space of the body—as prosthesis, enhancement, environment, but also as a weapon against the human body—and argues for establishing a boundary that is not evident from the beginning. Jill does not try to keep herself separate from technology, but rather to create a difference that is not evident from the beginning. A Luddist message of liberation from machinery is undermined through presenting technology as intricately enmeshed in the lives of the characters.

Machines and alien bodies

Ridley Scott's 1979 film *Alien* follows a similar trajectory, but its theme is somewhat different. The story follows the crew of the space freighter Nostromo, who struggle against a horrific alien creature they unwittingly pick up on an uncharted planet. The alien first

attacks one crew member by attaching itself to his face (breaking the vacuum suit helmet in the process), then apparently dies off without doing any considerable harm. Only much later does it reappear, this time killing its victim by bursting from his stomach. Constantly growing, the monster kills off all the crew members one by one until Ellen Ripley, the sole survivor, manages to push it out through an airlock into the vacuum. Much of the film's impact derives from its visuals, particularly the contrast between the clean, futuristic corridors of the starship and the organic, slimy monster (designed, to considerable critical acclaim, by Hans Ruedi Giger) that literally pollutes the space with bodily excretions, both its own and its victims'.

Barbara Creed (1990) reads *Alien* as providing a fantasmatic re-enactment of separation from the mother, following the psychoanalytic description of the creation of the subject. The child asserts its subjectivity by rejecting unity with its mother and by establishing boundaries between itself and the Other. The filmic monster is taken to represent the fluid physicality associated with the mother, and the crew (particularly the cold, self-possessed Ripley) represent the rational subject. The horror presented in the narrative, Creed argues, is that of reabsorption back into the womb, and the resulting loss of subjectivity.

But there is more to this film than Oedipal fears of reuniting with the mother, particularly in regards to my discussion of the human body *vis-ŕ-vis* computerized spaces and the Cartesian mind/body distinction. For the spaces presented in *Alien* are strongly technologized, and they need to be interpreted as such. The slime-dripping monster threatens not only the orderly lives of the crew, but also the rational, machine-filled space of the starship. This is indeed a narrative of dangerously blurred boundaries, but the transgression involves mingling machinery with biology or, on a more symbolic level, the body with the mind. Scott Bukatman correctly notes that

> *Alien* is the film in which *the body* invades the pristine and sexless rational spaces of the science fiction film. The genre hasn't been the same since. (1993: 267)

but he fails to identify that invasion as the prime source of horror in the film. After identifying the alien as a thoroughly impure life form, Bukatman perceives impurity as ever-present throughout the whole narrative:

> The separation of (rational) technology and (slimy) biology is very nearly a structuring principle of the science fiction film, and thus the transgression represented by *Alien's* alien is unquestionably important. The organic, almost intestinal, spaces of both the alien craft and the corridors of the Nostromo are invaded by a silicon-based life form that blends easily with the pipes and protrusions of human machinery (ibid.: 266).

What he appears not to notice is that the corridors of Nostromo become intestinal only after being invaded, or infected, by the biological alien—as long as the ship remains unperturbed in its journey, the only spaces shown are pristinely clean. The first dissonance, a coffee-cup left on a computer console—appears only when the ship is jarred out of its schedule by a received distress signal. Impurity represents danger, but the impurity presented in *Alien* is always an incursion of the bodily into the rational, or mechanical. This is the limitation of the gendered readings of the film, such as presented by Creed: while the monster can be described as continually giving birth to itself (Newton, 1990), it is also phallic, penetrative, and incessantly violent. It cannot be easily categorized as to its gender, because it represents all the bodily functions, as opposed to Nostromo, which operates at its best with its crew placed in cryogenic storage. Crew members are also largely ungendered—differentiated according to their position in the ship's hierarchy but not according to biology (Constable, 1999). The alien stands in for the body, Nostromo represents the machine/mind; their attempted fusion leads to disaster.

The narrative's resolution sees and expulsion of the monstrous body into (outer) space, and Ripley's return to cryogenic sleep. Significantly, the alien is not obliterated, but only expelled. The body and the machine/mind continue to exist, but they do so in proper separation.

Reading *Alien* as a parable about Cartesian dichotomy gets even more interesting if one considers how this motif has been treated in the movie's sequels. Three more films have been made continuing the original storyline: *Aliens* (1986), *Alien*[3] (1992), and *Alien: Resurrection.* (1997). All of them chronicle Ellen Ripley's meetings with the monster, or rather with a whole alien species. The continuing trend across the whole series builds an ever stronger link between Ripley and the alien: the body cannot be denied. At the same time, the basic opposition breaks down—humans can no longer be regarded as representing rational technology, and are given to a much wider range of behaviours. This can be read as an inability to sustain such a dichotomy over a longer narrative, but also as a redrawing of boundaries: the central transgression of the original is no longer engaged (or engaged to a much lesser extent). Not surprisingly, none of the later films can even approach *Alien* in its capacity as a horror movie.

In *Aliens,* the heroine returns to the planet where the creature was originally found, to accompany a military rescue team investigating the fate of a human colony established there. Predictably, the settlement is destroyed, and the whole mission turns into a disaster as soon as aliens appear. Once again Ripley is shown as remarkably self-possessed, and capable of taking rational action while the rest of the team break down. At the same time, there are parallels drawn between herself and the queen alien (for the aliens are shown to live in an insect-like society)—most notably, Ripley's wish to protect a human colonist child and the monster's protectiveness towards its eggs. But the exposition of (some of) the alien's nature has other significant effects:

> The conflict between the human and monstrous is that of humanity versus insects. Importantly, this changes the structures of horror. If the threat of *Alien* is that of a visceral *inside*, the threat of *Aliens* is that of a viscous materiality that must be designated *outside* (Constable, 1999: 186).

In other words, the danger is no longer that of realization of one's status as an embodied being, but the inability to establish bodily boundaries. The body in this narrative can still be regarded as an object, and so the aliens no longer jeopardize one's identity. *Alien*[3] continues the theme of endangered body, rather than of being threatened by the bodily.

Ripley discovers she has been implanted with an alien embryo, apparently once again displacing the menace inside. But the whole story takes place on an all-male penal colony, where Ripley is regarded as an obvious outsider (this is the only *Alien* movie in which gender becomes an important dividing line among characters). Associations between her and the alien (once again a singular entity, although intent on breeding) are drawn to a much fuller extent than in the previous film, yet the feeling of unease created so strongly by the original movie is absent. Although numerous boundaries are crossed, they are not called into question. Ripley, as feminine outsider carrying a future monster queen within her, is repositioned as an external threat to the penal colony. Yet even as the base comes under attack from the two female invaders, it does not become polluted by them—it remains in largely the same state as it was before, with no organic spaces of unknown and uncertain status known from the previous movies.

By showing the possibility of rather unthreateningly crossing numerous boundaries, however, the film prepared the way for *Alien: Resurrection,* the last instalment in the series. This movie breaks away from its predecessors in that it is not a traditional horror picture. All the characters (including the aliens), with the possible exception of the military, are quite sympathetic, and their inevitable conflict is seen as lamentable. Indeed, the plot features a clone of Ripley (the original character died at the end of *Alien*[3]) created out of a

fusion of the genes of her own and that of an alien. Recreated by the military complete with the embryo inside (and with a dubious explanation of why it was possible and how she can remember her former life), she is left in a cell when the alien is taken out of her body. When the monsters inevitably escape and wreak havoc on the space station, Ripley escapes confinement and teams up with a group of mercenaries to get away from the installation run over by rampant aliens. In effect, she has completed the trajectory begun in the first movie, and has accepted the monstrous, i.e. the bodily, as part of herself. She accomplishes it not by rejecting the human/rational, as in *Alien*[3], but by accepting the diversity within her. In this regard the tone of the film is celebratory. One scene features an android, Call, who laments her and Ripley's hybrid existence of not being wholly human. Yet it is her powers as an android that save both her life (she survives a shot through the chest that would kill an ordinary human) and that of a group (she can hack the base's computer). Similarly, Ripley's new state is presented as superhuman rather than inhuman. The new aliens, on the other hand, infused with the human genetic material, appear for the first time as sentient and sympathetic, if radically violent, creatures. When Ripley is forced to kill the new generation, very humanoid alien, the scene is cast as a narrative of loss rather than of triumph.

Through the figure of Call, *Alien: Resurrection* returns to the subject of the union between humans and machines. As with many other aspects of this film, the trope is a culmination of the android motif running through the whole series. In *Alien,* the android crew member Ash appears as completely attuned to the technological starship environment but, when revealed to be in league with the monster (attempting to bring it back to earth at the behest of the corporation owning Nostromo), is unmasked as thoroughly entrenched in its organic-looking physicality, spouting milky-white bodily fluid in a gruesome death scene. In *Aliens,* another android, Bishop, re-establishes proper boundaries (and allays Ripley's fear of androids) by behaving as most loyal in the service of the human order, and

volunteering to undertake a dangerous mission in order to save the whole group. Call continues the sequence of alphabetically named androids but subverts the series in being the first female one.

For regardless of my having argued that gender differences are not the structuring axis of the *Alien* films, the movies nevertheless tackle the issue, as it is inextricably bound with the discourse of the body. In the traditional mind/body dualism, the rational mind is associated with the male, while the body denotes the female, exemplified by the intensely physical and exclusively female task of giving birth (Spelman, 1982). The view involves not only separation of the two, but also their hierarchization. Judith Butler comments:

> In the philosophical tradition that begins with Plato and continues through Descartes, Husserl, and Sartre, the ontological distinction between soul (consciousness, mind) and body invariably supports relations of political and psychic subordination and hierarchy. The mind not only subjugates the body, but occasionally entertains the fantasy of fleeing its embodiment altogether (Butler, 1990: 13).

The linkage of masculinity, mind, and machines opposed to and dominating over bodies and femininity forms a powerful classificatory tool that allows definite positioning of subjects on either side of the divide. Destabilizing any part of the distinction disturbs the whole construct, which is why the *Alien* films, replete as they are with images of birth and maternity (but also of phallic penetration), lend themselves so easily to gendered readings (cf. Taubin, 1993; Izdebska, 2001).

Virtual minds and bodies

I have discussed the *Alien* series at such length because I believe they encompass a whole range of problems associated with defining the body, and are thus very helpful in delineating the field of my interest in the matter. Before I turn to examine some of the issues that were signalled in the films, I need to complete marking the general territory of

my analysis by turning towards the one subject that does not appear in their narratives, but which is crucial for my explorations: the virtual space. The cyberpunk genre deals with the theme at length in both literature and film, and as such provides a good introduction into the associated issues.

In the previous chapter, I summed up the majority of cyberpunk narratives as describing virtual space as completely disembodied. The body is lost at the moment one enters cyberspace, and reacquired only upon exiting. But I have also hinted at some of the works that do not conform to this theme, and it is there that I would like to look now for inspiration.

In John Meaney's *To hold infinity* (1998), surgically enhanced humans gain heightened perception and improved communication skills because their improved brains[17]are able to better utilize their senses and, more generally, their bodies. Additionally, the enhancements provide a connection with a computer information network wherever it is available, making vast amounts of data instantly available. Unlike most literary and cinematic cyberspaces, this one has a thoroughly grounding effect on its users. As the network, the use of which makes life much easier, covers just one planet, that is a fragment of the inhabited universe of the novel, the cybernetically endowed elite rarely travel far from their homes. Unlike many characters in cyberpunk stories such as Mechanists in Bruce Sterling's *Schismatrix* (1985), whose bodily immobility is compensated by their mind having free access to wide area cyberspatial perceptions, Meaney's protagonists concentrate their attention on the immediate surroundings. Increased awareness is paid for by restricted range of one's actions.

[17]Note the dychotomy again: the body itself remains largely untouched by the enhancements—in the usual modification process, only the cranial cavity is enlarged to accomodate additional tissue.

As the body as an agent of experience is so central to the characters of *To hold infinity,* it comes as not surprise that forsaking (or radically altering the nature of) the body is presented as singularly abhorrent. Rafael, the villain of the narrative, is revealed to have installed numerous artificial brain-nodes outside of his body, using faster than light communication to facilitate functioning of the brain spread out over the entire planet. With the size of his brain no longer limited by the space available inside his cranial cavity (or his body in general), Rafael is able to accommodate a heretofore unthinkable number of mind-enhancing implants. However, while magnifying his mental power, Rafael's numerous implants turn him into an inhuman monster. His madness is explained as the result of the stress involved in assimilating so many brain-enhancements, but it can also be seen as stemming from the dissolution of the embodied relation to the world enjoyed by other characters.

While *To hold infinity* brings the cyberspace into contact with the body, Andy and Larry Wachowskis' 1999 film *Matrix* engages the issue of corporeality in the virtual world. Its protagonists cross the border between the physical and the virtual in a typical cyberpunk fashion: their bodies slump, seemingly unconscious, next to the computers, while minds visit artificially created worlds. What differentiates *Matrix* from the standard is that in cyberspace, the characters appear largely as they did in the physical world, fully equipped with human-seeming bodies.

The virtual bodies are capable of various superhuman feats, such as punching through concrete, dodging bullets, or breaking steel chains with bare hands. At the same time, they retain some vulnerability: bullets that are not dodged can easily kill them, and for *Matrix* characters, death in the virtual world invariably leads to death in the physical realm as well; the two bodies (physical and virtual) are too strongly linked for one to survive without the other. Except for being threatened by violent death, the superhuman body of *Matrix* comes close to realizing the dream of the ideal virtual body as described by Deborah

Lupton, capable of enjoying the pleasures of existence while freed from the vagaries of the flesh.

> The idealized virtual body does not eat, drink, urinate or defecate; it does not get tired; it does not become ill; it does not die (although it does appear to engage in sexual activity, as all the hype around 'teledildonics' and virtual reality suggests) (Lupton, 1995: 100-101).

To this might be added the capacity for cyberspatial violence, present in many literary and filmic narratives, as well as in innumerable computer games. The virtual body, while not easily hurt, can and often does inflict harm, and the cyberspatial death (if such exists) is always a violent one.

This vision may be considered to be the apotheosis of the post-Enlightenment separation of the body from the mind, in which the body has traditionally been represented as earthly, irrational, weak and passive, while the mind is portrayed as spiritual, rational, abstract and active, seeking constantly to stave off the demands of embodiment (ibid.).

Unmediated virtuality

Jeffrey Fisher (1997) recalls the same vision as the myth of angelic bodies—virtual bodies existing only in cyberspace, unencumbered by the problems of corporeality—and traces it to cyberpunk novels as well as to the ideas expressed on various MUDs[18] and in the writings of Marvin Minsky and Hans Moravec. Indeed, the idea is present in many enthusiastic reassessments of today's virtual realities, often coupled with additional promises.

One expectation is that of an unmediated bodily contact with technologically imagined spaces. Marie Laure Ryan (2001) writes of interaction in virtual reality as non-symbolic, i.e.

[18]Multi User Dungeons or Multi User Dimensions—text-based virtual worlds, particularly popular in the late 1980s and 1990s, then largely supplanted by graphical MMORPGs, that is Massively Multiplayer Online RolePlaying Games (cf. Turkle, 1995/7; Curtis, 1992/96).

requiring no culturally contingent code. Significantly, the term she invokes to describe it is Swedenborg's "language of the angels." Unfortunately, she fails to explain why communication (the form of interaction she specifically mentions) can become nonsymbolic by mere virtue of its displacement into virtual reality. As the vast anthropological lore from Levi-Strauss (1962/6) to Mead (1964/99) to Clifford (1988/2000) and beyond aptly demonstrates, communication is always a symbolic process, and there seems no reason to suspect that mediating it through virtual reality is going to change that.

Even stranger is Scott Bukatman's comment that "virtual reality represents an attempt to eliminate the interface between the user and information" (1993: 191), especially when coupled with his own definition of human-computer interface as "existing between a body *and* a space" (p. 192, original emphasis) and the description of cumbersome gloves and helmets responsible for the virtual reality experience. While his somewhat unclear exposition can be interpreted as denoting the invisibility of the interface and the blurring of the boundary between the human body and electronic spaces, the thrust of the argument remains the same: virtual reality technologies (strive to) present cyberspace to their user as an unmediated experience, effacing their own existence through technological gimmicks. While it is possible, if unlikely in the foreseeable future, that such equipment might become totally undetectable during its use, the devices will continue to *represent* virtual reality[19]. And so far, developments in technologies of simulation have been accompanied by equally potent developments in techniques of discernment, allowing for differentiation between the real and the projected (Comolli, 1980/2001). The earliest cinematic productions are often described as having a staggering effect on the

[19]In yet another incarnation of the Cartesian dualism, Marie-Luise Angerer (1997/8) perceives the body itself as an interface, standing between the user, apparently reduced to a disembodied mind, and technology (or between the user and the technological interface).

audience. The most commonly recounted story describes people fleeing the cinema where a film depicting a train approaching the screen was being shown. While Marcus Doel and David Clarke (2002) caution that such stories might have been a marketing scheme (trying to draw the thrillseeking crowd by promising shocking experiences) rather than factual reports, it is beyond doubt that the old films appeared much more convincing to the contemporary viewers than they do today.

There is another hurdle for virtual reality to be perceived as unmediated experience. The forces of corporate marketing and branding are sure to pounce on the opportunity to impress their brand on the viewers, insisting that the latter be aware of the exact make and model of the equipment (that is, the interface) they are using.[20] Quite probably, the configuration of virtual reality devices will also be instrumental in determining the quality of available sensory perception, much as a TV set has a direct influence on the displayed picture's size and clarity.

Regardless of the mediated status of their experiences, bodies do exist in virtual spaces, thanks as much to textual technologies as to virtual reality equipment. Some of them represent visitors from the corporeal space. Matthew, one of the heavy Internet users interviewed by Annette Markham (1998), is described as projecting a very strongly embodied presence over the net. He constantly writes of the actions of his virtual body, thus providing substantiality above those of Markham's other interviewees. The physicality of his body is used to conflate the virtual and the physical, creating a corporeal presence that spans across the boundaries of these worlds.

[20]Advertisements preceding every screening in IMAX 3D technology, arguably the most immersive widely available projection technology, as well as advertisements describing each version of the Dolby Digital sound technology used for a particular film/cinema, serve the same function in relation to today's immersive media.

Gender

Such corporeality is not as easily attained by those virtual bodies that, at least initially, lack physical counterparts—the native inhabitants of cyberspace. Barbara Czarniawska and Eva Gustavsson (2002) examined a number of such entities—the web women, that is virtual female personal assistants. Significantly, their most outstanding characteristic is their gender identity, even though their environment, the net, appears at first as a place where gender would at best play a secondary role—after all, none of the assistants is expected to partake in any sexually exclusive, or sexual, activities. Yet consistently with Allucquére Roseanne Stone's (1995) insight that ordering modes tend to be mapped quite literally and unreflexively from the physical world onto the virtual, gender remains the primary, and binary, differentiating principle in regards to virtual bodies. This thesis is further emphasized by the deeply traditional gender roles ascribed to the virtual characters: the web women are docile and accommodating, even as they claim to be world-class experts in their field of expertise.

The traditional roles are not restricted to female characters—male virtual bodies, such as that of ill-fated Microsoft Bob—a personal assistant, or agent, unsuccessfully (and rather briefly) marketed by Microsoft in 1995—are similarly stereotypically gendered. Not surprisingly, the advertising campaign for Microsoft Bob involved images stylized as 1950s.

> Gender is indeed a social construction. But it is an embodied construct. Whatever the bandwidth, whether it be the telephone or online text, when we interact with another with whom we do not have physical contact, we proceed as if they were embodied .... To do so we must conjure an image of them. Gender—based on a conventional female-male binary—is the primary dimension by which we do so (O'Brien, 1999: 100).

When bandwidth is limited, that is the amount of information conveyed about the encountered body is severely restricted, as in the case of cartoons or, indeed, virtual

bodies, the gender dichotomy needs to be much more forcefully stated to be perceived (and preserved) than in higher bandwidth. Hence the exaggerated and overly stereotyped gender roles taken up by the virtual characters.

But there is another trope in the construction of identity at work here that bears examination. For the gendering is carried out not only through the initial creation of the virtual body, but rather is construed and enacted through interactions in which the body finds itself. And all these interactions involve the space across which they are played, in this case the virtual environment. Czarniawska and Gustavsson narrate the story of a virtual financial advisor, Hera Qraft, gaining increasing identification with the, again virtual, game star Lara Croft (more about whom in a moment) despite loud protestations from HQ.SE, the company which Hera represents.

Gillian Rose describes space as always discursive, fantasized, and corporealized, that is existing invariably in relation to the perceiver's body, and both imagination and interpretation are involved in its constitution. For her,

> space is not an anterior actant to be filled or spanned or constructed, and to claim it is runs the risk of making a contingent spatial articulation of relationality foundational. Instead, space is practiced, a matrix of play, dynamic and iterative, its forms and shapes produced through citational performance of self-other relations (Rose, 1999: 248).

This does not mean that space, be it virtual or physical, is infinitely plastic—certain forms are more prevalent than others, but this is an effect of power that saturates the performance of space. And the power found pervading cyberspace is largely the effect of the dual forces of male domination and multinational capitalism, as witnessed by the bodies of the web women combining characteristics of a traditional woman and an ideal employee. Gregory Little assesses the currently dominant virtual bodies as

> a colony of extremely generic, homogeneous representations rooted in prevailing construction of successful commodification and accumulation: pop

> icons, juvenile fantasies, dumbed-down cartoon characters, and racially pure, white, young, "perfect bodies" (1999: 2.3).

His list should be, of course, amended by the unambiguous gender typization embraced by these bodies. At the same time, Little proposes the creation and proliferation of subversive, boundary breaking and trans-gendered virtual bodies as the only viable strategy of resistance:

> The partial, the schizoid, the nomadic and the local are threats to the primacy of capital. Fragmentation, irregularity, dissolution, hybridity, swarming, and wandering stubbornly are lethal weapons against globalization (ibid.: 5.0)

Anne-Marie Schleiner (2001) strikes a similar note speculating about the possibilities of reappropriating virtual female images for feminism or more generally, for undermining traditional gender constructions. She is, however, more specific in her proposed strategy of resistance: she believes in subverting the commodified meanings by reworking the pre-packaged online bodies (and identities). This can be realized through editing (hacking) their appearance as well as through reinterpreting the narratives surrounding these bodies.

One of the figures discussed by Schleiner is Lara Croft, the heroine of a computer game series *Tomb Raider.* After having gained immense popularity while existing only in a virtual form, Lara began making appearances in the corporeal world. Her doing so is facilitates by the use of five actors/models standing in for her. Magdalena Radkowska (1998) argues that this is best described not so much as actors playing the role of Lara[21], but rather as Lara taking over, or borrowing, the physical bodies in order to enter the corporeal space. The women offering their bodies for Lara to wear (a task which reportedly necessitated the use of plastic surgery) do not follow fixed scripts, and EIDOS, the company that wrote *Tomb Raider*, insists that Lara is embodied, rather than played (as opposed to the buyers of the game, who play but do not embody the character), by these women.

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[21]The latter did happen in the 2001 film *Lara Croft: Tomb Raider,* starring Angelina Jolie as Lara Croft.

Crossing over

The subject of crossing over from virtual into corporeal existence is also the subject of William Gibson's latest novel, *All tomorrow's parties* (1999/2000). Rei Toei, an artificially created, but autonomous, denizen of virtual reality is the prime mover behind the events of the story, much like the artificial intelligences Neuromancer and Wintermute were in his first novel, *Neuromancer.* The motives of Rei Toei are quite different, however. While Wintermute's goals (if not the means) were restricted purely to cyberspace: it/he[22] attempted to unite with another AI, Neuromancer, but Rei Toei reaches across different spaces. *Idoru* (1996) chronicles the ultimately unsuccessful attempt by Rez, a human rockstar, to marry her (there is no mistaking of the gender identity here). When that doesn't work out, Rei Toei begins to plan her own crossing into the corporeal world, which provides the plot for *All Tomorrow's Parties.* Her wish is ultimately fulfilled through cutting edge corporate technology: Rei Toei subverts nanotechnological fax machines (supposed to be able to produce a copy of any object at a distant location) to build a corporeal form of her virtual body. Embodiment, as opposed to the disdained "flesh" in *Neuromancer*, is here shown to be central to becoming an actual person: only by gaining a body can Rei Toei enjoy full-fledged existence. This is evident in the strength of her desire, mirrored in the mode of its fulfillment: not content with having just one body, Rei Toei emerges out of a nanofax machine of every franchise the world over of the ubiquitous Lucky Dragon chain. Only hundreds, or possibly thousands of bodies can satisfy the hunger roused by bodiless existence. It is this strong linking of physical existence, and thus of physical space with having a body that leads me to use the term corporeal space as the usual label for the space occupied and lived in by the physical body.

[22]Wintermute's gender can be read as both nonexistent and masculine, as discussed by Tyler Stevens (1996).

The situation in *All tomorrow's parties* is made more complex by Rei Toei's having a mechanical body prior to her acquisition of a virtual one: it comprised of a metal cylinder (compared to a thermos by one of the characters, equipped with infrared glasses, in *Idoru*). While capable of displaying a human-size hologram when provided with an appropriate power source, the "thermos" did not allow Rei Toei any agency in the corporeal space. For that, she needed a fully human body or bodies like ones acquired at the end of the novel. The story ends without providing any answers in regard to her relation to the newly constructed human bodies—it is the process of embodiment that the novel describes, not (yet?) the particularities of embodied life.

An even more complex picture of bodily crossings into and out of cyberspace is painted by Roger Zelazny and Jane Lindskold in *Donnerjack* (1997), a novel sharing little of cyberpunk aesthetics but taking up many of the themes characteristic of the genre. Whereas a single crossing constitutes the plot of *All tomorrow's parties,* a whole number of different transitions take place in *Donnerjack.*

The novel's cyberspace, called Virtù, has evolved to constitute another world in its own right, one supporting its own inhabitants and ecologies as well as providing for realization of the duties imposed on it by the inhabitants of the physical world (identifiable with our own), there called Verité. This means that Virtù is not just a spatial representation of data physically present in the world of Verité (although it also serves such a function), but a reality that contains features that do not have a counterpart in the physical world (if, indeed, Verité can be classified as such).

At the start of the novel, it is apparently possible to act upon Virtù from Verité, but not the opposite. Throughout the course of the story, however, several interventions from cyberspace into the physical occur, and all of their effects are rooted in corporeality. A deceased inhabitant of Virtù is brought back from the dead into Verité. A sexual intercourse

in Virtù, between the realm's native and a visitor whose body lies dormant in Verité, leads to a corporeal pregnancy. Moreover, it turns out that actual bodily passage between the two worlds is possible for at least some of the inhabitants of each (including the novel's protagonist, John D'Arcy Donnerjack). Only such bodily transition can finally equate the status of Virtù and Verité, as embodied presence is once again affirmed as signifying the final reality.

What sets the novel apart from most other science fiction involving virtual worlds, however, is its ambiguity on the nature of the link between the worlds. While Virtù is revealed to contain people and spaces from Verité *'s* myths, such as the Babylonian gods and the Celtic realms of the Sidhe (both predate by far Virtù *'s* supposed creation in the twenty-first century), its relation to Verité *'s* mythology or to its cyberspace is never systematized. The two worlds exist in a state of constant tension, where boundaries are constantly redrawn and where bodies are poised somewhere on the ever-shifting edge between the corporeal and the virtual.

Involvement of the mythical element is a recurring motif in Roger Zelazny's fiction, and one which I believe serves as an reminder of the numerous cultural and social processes at work in the construction of reality or, as the case may be, of the body. A much earlier novel by Zelazny, *Creatures of light and darkness*, features a character called the Steel General who evokes many of the issues involved in defining the body in an environment pervaded by machines:

> Having bedecked himself with prostheses, he lived out his time. He had a synthetic heart and arteries; he chewed with synthetic teeth and watched the world through synthetic eyes. A metal plate was inset in his skull, and he was given bones made of plastic. And so he lived with wire and porcelain inside until the time when science could create limbs better than the ones provided by nature. Organ by organ he was taken apart again and in the next century he was superior to a flesh and blood human.... Time and again he traded

> metal for body and became once again a normal human.... He is the spirit of rebellion, which is eternal (Zelazny 1969/88: 45 and 66)[23].

While rebellion and its embodiment, the Steel General, are declared to be eternal, there is no final form that it (or he) takes. The constant flux of his existence recalls Deleuze and Guattari's (1972/84) re-reading of Antonin Artaud's idea of a Body without Organs, the ever-changing entity that accepts no fixed identity, no fixed definition. This is the final strategy of resistance, for the shifting body accepts no inscription of power. It is the ultimate opposition to the inscribed and disciplined bodies so frighteningly described by Foucault (1975/91); no wonder the Steel General is hailed as the spirit of rebellion.

Cyborg

But his figure is particularly useful to my discussion through his associations with technology, or rather through his literal incorporation of numerous technologies, as well as of myths and ideas. This feature likens the Steel General to many contemporary descriptions of the human conditions. For it is impossible to isolate ideal types that would honour a strict boundary between people and technologies—there is no completely atechnological human nor a machine incorporating no human elements, only intermediate entities that mesh qualities from both realms. A meeting between a flesh and blood human and a silicon or steel machine is thus an impossible event; instead, one is left with meetings between various flesh and blood machines. The difference lies only in the distribution of relationships:

> On one side, you hale one body Explorer by ten thousand biologists, cytologists, and neurologists, while on the other side you have one computer concentrating the brain power of ten thousand engineers, software writers, and wafer printers. (Latour and Powers, 1997: 179).

[23]Much to my dismay, I have been unable to locate an English copy of this book (due for a reprint in 2003). Because of this, the quote is retranslated by me from Polish into English and does not appropriately represent Zelazny's poetic language.

Instead of a sociological human being and a mechanical computer (the pair that would form an ideal setup for explorations of computerized spaces), one encounters hybrids containing human, mechanical, and symbolical elements. The most common name given to such entities is the word cyborg.

Its history can be traced to an article by Manfred Clynes and Nathan Kline's (1960/95) dealing with the possibilities of human survival in hostile environments, particularly the outer space. Rather than providing mere tools for protecting the fragile human body, the text proposed forming human-machine hybrids (most notably a human brain encased in a machine body) that would be better suited for the hardships of outer space. The article witnesses a rapture with cybernetics characteristic of the time, visible already in the word "cyborg," being a contraction of cybernetic organism. The idea of mechanically enhanced human was quickly appropriated by science fiction literature which broadened the definition to include all fusions of humans and machines. Still later, the cyborg was reintroduced to the scientific discourse by Donna Haraway, a social theorist attempting to create

> an ironic political myth faithful to feminism, socialism, and materialism. Perhaps more faithful as blasphemy is faithful, than as reverent worship and identification. Blasphemy has always seemed to require taking things very seriously (Haraway 1991: 149).

This reconceptualization of the cyborg has enjoyed immense popularity (e.g. Gray, 1995; Downey and Dumit, 1997) as it evoked very well the peculiarities of hybrid social actors formed at the juncture of biology, technology, and sociology, spanning sciences and humanities and throwing modernist classificatory schemes into disarray. The new cyborg follows the logic of introjection, attempting to embrace and incorporate difference into its own discourse (Morse, 1996/8).

It is an important development, for Clynes and Kline's cyborg, informed as it was by the newly founded transdisciplinary science of cybernetics and its idea of feedback loops, was posited as a technical science project, albeit one relevant to the whole fate of humanity (cyborg was to represent the first time humans took control of the evolution of their own species). Donna Haraway's cyborg reinterpreted for postmodernity is much more precarious in its positioning; no longer just a fusion of living organism and machinery, the new cyborg also conflates different (and often contradictory) cultural inscriptions, discourses, interpretations. From today's vantage point, the stainless steel cyborg of the 1960s does not seem as culturally innocent anymore: it too bore cultural imprints since its conception, Cold War space rivalry and faith in the promises of cybernetics being the most obvious ones. But it did not realize its involvement in anything beyond space exploration; today's cyborg, on the other hand, is quite conscious of the numerous discourses it embodies, of its own liminality, lack of fixed boundaries, and of the contradictions inherent in its hybridity.

> The cyborg is resolutely committed to partiality, irony, intimacy, and perversity. It is oppositional, utopian, and completely without innocence (Haraway, 1991: 151).

This story once again recalls Roger Zelazny's Steel General: he too was born from the industrial-military complex (note the name), but like Haraway's figure rebelled against this origin. The difference lies in the cyborg's gender—the one feature that the novelistic character does not problematize: today's cyborg is mindful of the feminist legacy which informs it as much as the cybernetic narrative does. Its politics is largely the politics of gender.

The history of cyborgs, however, reaches far beyond the history of the word itself. For the concept can be used retrospectively, to describe the course of human interaction with

technologies dating back to the earliest experiments with tools. Thus, David Hakken asserts that

> humans have been quite "cyborgic" from early in the emergence of the species. Technology is so deeply implicated in human existence that it is a core aspect of our being (1999: 72).

But it would be a mistake to imagine cyborgs as representing, or symbolizing, the eternal condition of humankind. Even if such exists, it is not served very well by the figure of a cyborg. The latter is too far implicated in the particular, situating it at this specific juncture of western history and discourse. While hybrid liaisons with machines and technologies have been ingrained in the human history for ages, theirs is not the tale told by the cyborgic body.

> The cyborg is a cybernetic organism, a fusion of the organic and the technical forged in particular, historical, cultural practices. Cyborgs are not about The Machine and The Human, as if such things and subjects universally existed. Instead, cyborgs are about specific historical machines and people in interaction that often turns out to be painfully counterintuitive for the analyst of technoscience (Haraway, 1997: 51).

Technological figures appearing in a number of 1980s and 1990s science fiction films are also dubbed cyborgs (cf. Holland, 1995), and their story of a fusion between the body and technology is sufficiently different from Haraway's account to warrant a closer examination here. I shall concentrate on the two most famous Hollywood depictions: *RoboCop* and two *Terminator* films as the largely monolithic discourse of such narratives does not warrant a more detailed analysis as far as the construction of a technologized body is concerned.

Paul Verhoeven's 1987 film *RoboCop* tells a story of a cyborg constructed using a robotic body and the mind of a policeman killed by criminals. At the same time, however, neither is the mind completely human nor the body completely robotic—half of a human face is

still visible under a steel helmet, and numerous programs and hardware devices (tape for storing memories) influence Robocop's mind. This should not be surprising in the light of the previous discussion of the impossibility of drawing a clear dividing line between the human and the machine.

Created as a new law enforcement device, and treated as a device by OCP, the corporation which created him, RoboCop faces not only criminals but also numerous obstacles caused by the corruption within OCP. The gendered pronoun is clearly justified here—while Robocop spends much of the film searching for his self-identity, he is consistently presented as a clearly gendered entity. Macgregor Wise construes this search as part of the human/machine conflict central to the movie—machines lack identity and its recovery by RoboCop serves to ascertain his status as a sentient being.

> Significantly, the identity resumed by Robocop is that of the middle-class family man (Wise, 1997: 24).

Such typization clearly suffices as the cyborg's mark of personhood as he already possesses a humanoid body that the protagonists of cyberspace fictions needed to confirm their right to subjectivity.

Facedowns with two antagonists, one robotic and one human, form the most interesting points for examination of the hybrid status of RoboCop's body. As Mark Poster (1995) notes, ED-209, a homicidal robot also created by OCP, is defeated not through superior strength or firepower (or brainpower, for that matter) of the RoboCop, by through a glitch in its own body—it cannot walk down the stairs. With ED-209 serving as the robotic double to the protagonist's cyborgic existence, it pays to note that RoboCop's body (legs in this case) is not human (nor, except for his face, cyborgic) but also robotic (although humanlike in opposition to the machinelike ED-209). Thus, while the conflict is between a robot and a cyborg, the cyborg wins because of the superiority of its robotic part. Although presented

(and often read) as the victory of (cyborged) humanity, the latter is displaced out of the climactic encounter.

A similar pattern replays itself in the hero's struggle against the main villain of the film, the corporate leader Dick Jones. RoboCop, equipped with a program that prevents him from arresting his superior, overcomes the obstacle when he

> replays his memory-tape, providing evidence of Jones's conspiracy to murder, and thereby evading the limitations of his programmed instructions and defeating his protagonist *[sic!]*. When the brute force of his mechanism has been stifled by a computer "program," highly classified directive 4, that inhibits him from arresting his own superiors, another informational system nullifies the limit of his programming—he has been supplied with visual and aural memory in tape format. In the mode of information, decisive powers are not mechanical but informational (Poster, 1995: 139).

Mechanical or informational, the decisive powers are once again clearly situated in artificial systems (i.e. computer programs determining RoboCop's allowed range of behaviour), and not between the human antagonists—RoboCop's human conscience is already aligned against Dick Jones' immoral schemes, but the outcome is decided through the duel between the various programs running in RobCop's robotic mind.

Ultimately, the movie refrains from showing RoboCop as a hybrid entity. There is clearly no fusion between the human and the robotic side of the protagonist. Regardless of his mingled appearance and supposedly cyborgic identity, all of RoboCop's trials can be identified as engaging either his robotic or his human parts. The only interesting point is the display of conflicts within the robotic side of RoboCop—the machine is shown not as a monolithic construction, but rather as a fragmented psyche struggling through innumerable dilemmas and inner tensions.

The Terminator, a character in James Cameron's 1984 film of the same name, and reappearing later in *Terminator 2: Judgement Day* (1991), is by many definitions not a

cyborg but an android. Being a machine covered in biological tissue, the Terminator does not comprise a fusion between humans and technology unless one considers the social aspects of his humanity. Played by Arnold Schwarzenegger, he is immediately recognized as a human, or superhuman, male, and retains that identification (hence my use of the male pronoun) throughout both movies. This is a very significant issue, as many of the terminator's other traits change between the films. He is supposed to represent two different individuals, he appears as a villain in the original and a hero in the sequel, and he becomes alternately ever more machine-like and ever more human. What remains constant is his hypermasculinity, extraordinary bodily performance, and extreme capacity for violence. The latter can be seen as a redirection of the filmic cyborg's sexuality: masculine yet impotent (neither the Robocop, the Terminator nor the numerous other Hollywood cyborgs are capable of reproduction), he realizes his desire through violent penetration of bodies, machines, and scenery.

The redirection becomes even more contrived for the Terminator of the second movie, as he is forbidden to kill or injure right after displaying his potential for the first time. He compensates by generating extraordinary amount of damage to inanimate objects throughout the rest of the film. While getting integrated into the role of the father by John Connor, the boy he is sent to protect in *The Judgement Day,* the Terminator remains a traditionally macho hero. Macgregor Wise muses on this process of socialization as an attempt to allay deep-seated fears of the subversive capacities of new technologies:

> The technological figures are seen as a threat to traditional masculinity and can be allowed male identity only through a thorough integration into a normative social role (Wise, 1997: 41).

Both the RoboCop and the Terminator take up the traditional male gender identity and supplement it with extraordinary amount of violence (already, of course, present to some extent in the stereotype). The fusion of the human and the technological is thus realized by

subsuming the technology under the dominant male social role. The subversive potential of cyborgization is ignored in an effort to domesticate new technologies with the result being, quite unsurprisingly, domestic violence.

Bodies meet machines

Other artists rise somewhat better to the challenge of representing the melding of humans and technology than the Hollywood does. Perhaps the most famous of these, excluding writers, the work of whom I have already discussed to some extent, is an Australian performance artist Stelarc. His explorations of mechanic bodily enhancements include the third hand, the virtual arm, and the stomach sculpture inserted into the body "not as a prosthetic replacement but as an aesthetic adornment" (Stelarc, 1997: 250). Construing the purely human body as already obsolete, Stelarc, once again recalling and reworking the Cartesian division, asserts that

> [i]t is no longer meaningful to see the body as a *site* for the psyche or the social, but rather as a *structure* to be monitored and modified. The body should be considered not as a subject but as an object, but NOT AN OBJECT OF DESIRE—AN OBJECT FOR DESIGNING (Stelarc, 1997a: 243)

His discourse invokes the concept of posthumanity—the idea that humans as a species should no longer be held back by their biological heritage, but rather take evolution in their own hands (or whatever appendages they might wish to be equipped with at the moment). At the same time, posthumanity means relinquishing some of the authority over one's body, as bodily limits are revealed to be permeable, and the locus of control dissolves in a network of relations; Stelarc's involuntary arm, controlled not by himself but by the collective of his spectacle's viewers, represents just such a development. For Katherine Hayles (1999), posthumanity also means abandoning the idea of a single consciousness, and settling instead on viewing oneself as a multiplicity of agents jointly responsible for one's behaviour. Although she does not explicitly invoke the posthuman

discourse, Bronwyn Davis takes a similar stance in advocating the openness of the body towards its surroundings. She sums up her analysis in the following passage:

> What I have shown in this book are bodies in landscape, bodies as landscape and landscapes as extensions of bodies, all being worked and reworked, scribed and reinscribed. I have shown how the physical, discursive, emotional, political, and social landscapes with/in which we are subjected and with/in which we become speaking subjects are both solid and coercive, *and* fluid and shifting (Davies, 2000: 149).

Yet the dissolving of bodily boundaries is not always an easy or a peaceful process. Instead of the porous permeability celebrated by Hayles and Davies, the transgression can take the form of violent penetration, and it is no accident that the concept has already made a few appearances in this chapter; both the alien and the filmic cyborgs have resorted to this method of disposing of bodily barriers. I shall once again retort to fiction to illustrate the issue, presenting one film and one novel that touch upon penetration as a means of attaining virtuality and reconciling oneself with technology.

David Cronenberg's 1998 film *eXistenZ* is replete with the sexuality of penetration, coupled in the narrative with the passage into virtual spaces. The whole movie, like all of Cronenberg's work, is permeated by visceral technology, mixing images of organic bodies and machines in ways invariably suggesting sexual intercourse. In order to interface with the film's cyberspace, the characters need appropriate sockets installed in the base of their spines. Already this requires the body to be violently pierced by a giant metallic phallus. The actual crossing over involves an organic console inserting tendrils into the aforementioned socket. Both acts evoke sexual penetration, and both are presented in disturbing biological detail. Furthermore, passing from one space to another is shown as a dangerous endeavour, for both the user and the console risk being infected. Thus cyberspace is reached through a dangerous and violent sexual act, as the world's boundaries are pierced rather than merely transgressed.

Even more savage is the union between people and machines achieved by the characters in J.G Ballard's *Crash* (1973/96), for it comprises of taking part in deadly car accidents. The pleasure derived from it is literally the sexual fulfillment, and the protagonists experience ecstasy of the (all too) direct contact with the machines they perceive as ultimately arousing. The crashes are, of course, ultimately fatal, but the danger only adds to the sexual thrills of bodily transgression. The novel is significant not only in its depiction of technology as the object of literal desire, but also in its presentation of the body as accessible only when mediated by machinery. While the tone of Ballard's was strongly cautionary, it is Jean Baudrillard's famous reinterpretation of the text that best captures the themes of violent bodily transgression. Instead of remaining, like the author, a distanced observer, the French theorist aligns his stance with the characters' point of view, and their mechanophilic desires. He hailed the novel as an expression of a new aesthetics, of the ecstasy of creating artificial orifices and brutal incisions, praising the discovery of

> all the symbolic and sacrificial practices that a body can open itself up to—not via nature, but via artifice, simulation, and accident (1991: 316).

Vivian Sobchack (1995) is quick to point out the glaring insensitivity towards pain and suffering evident in Baudrillard's essay. She criticizes him for devaluing the body in his deluded desire to embrace technology without changing the nature of sexuality, by extending the traditional male narrative of violent penetration. Yet it seems to me the problem of Baudrillard's text lies elsewhere, and can be identified as simply a failure to notice the difference between breaking down and diffusing boundaries.

Nevertheless, both Cronenberg's and Ballard's visions address a central issue in constructing/inscribing the body, be it in the physical or in the virtual space. Relations with the outside can not be safely ignored (as it rises up in the guise of the Alien a.k.a. the Other), but the attempt to negotiate them through the traditional male logic of sexual penetration serve only to bring about violence without resolving any of the tensions.

Further difficulty arises from the coupling between such traditional male stance and the powers of corporate capitalism (Ebert, 1996). But at the same time, access to new spaces and technologies opens up potential to reinscribe the body, and to subvert the already embedded meanings. Thus in short, the paradox of cyborgic body is that it

> *is* both 'a dreary augmentation of multinational capitalism's mechanical process of expansion' and simultaneously, 'a sublime vision of human power.' And we must be attentive to the political irony embedded in our mythic cyborgs (Squires, 1996/2000: 371, original emphasis).

Departure point

Having examined the cultural landscape of the spaces surrounding computers and their users, I would like now to proceed to the examination of the field material regarding such spaces. But before I proceed, I would like to reconceptualize my analysis so far in the form of a model that I shall use as a starting point for my further research.

Such diagram obviously offers a very simplified view of the spaces I wish to examine, and it is not meant to summarize or sum up the discussion presented in the previous four chapters. Indeed, it runs counter to many of the ideas I have expressed there, such as the impossibility of drawing final boundaries, and the dynamic nature of all spatial relations. This is intentional.

The model is not meant to sum up the discussion from the previous four chapters, but only to foreground some of the most popular ideas about the organization of spaces around computers. Additionally, keeping this model very simple helps me remain open to the different conceptualizations of space stemming from the empirical study. This is not, strictly speaking the anthropological frame of mind advocated by Barbara Czarniawska (1992)—the openness to all facets of the observed combined with striving to rid oneself of

all the preconceptions about the subject of one's study. I set out already equipped with a model representing the spaces I wish to analyse, but with a firm resolution to amend and update it according to the field material.

For now, the model represents two spaces: the corporeal (that is physical) and the virtual (i.e. cyberspace). The former is associated, like its name suggests, with the body, while the latter recalls the mind in the Cartesian dichotomy. The barrier, or the link, between them bears closer examination—it might not be a monolithic rift, but rather a series of carefully etched and defended differences, bundled together. Or it might be redefined as a point of passage between the two.

Chapter 7: Space in computer press

Study outline

In the previous four chapters, I have analyzed both the academic and the popular discourse pertaining to various spaces, their boundaries, and the bodies that occupy them. I have shown the prevalence of a dichotomic Cartesian model opposing the material body to the immaterial mind, and posited the corporeal and the virtual as their spatial counterparts. Here, I would like to begin the examination of field material, specifically the discourse of space in Polish computer press. To facilitate that analysis, I shall start by taking a peek at the multiplicity of spaces that the human body inhabits. French philosopher Michel Serres elaborates on the subject:

> My Body (I cannot help it) is not plunged into a single, specified space. It works in Euclidean space, but it only works there. It sees in a projective space; it touches, caresses, and feels in a topological space; it suffers in another; hears and communicates in a third; and so forth, as far as one wishes to go (1982: 44).

The mind can of course be understood as having a similar array of spatialities to inhabit, and so the amount of possible spaces becomes truly staggering. A reinterpretation of this thesis could hold that one deals in fact with a number of bodies and minds, each constituting and constituted by the space it occupies (cf. Hayles, 1999). But as the culturally dominant models identifies only the corporeal and the virtual space (one of them hosting the human body, the other—the human mind), it is from these spaces and the singular mind and body that I begin my exploration.

In this chapter I attempt to investigate some aspects of the spatiality constructed around computers through an analysis of the discourse on space presented in Polish computer press. For this study I have analysed two and a half years' issues (1/1998 to 5/2000) of

each of the three most major Polish computer magazines - *Chip, Enter,* and *PC World: Komputer*, as well as the 1998 year issue of *Cyber*,24 a magazine whose attitude towards computer-related phenomena and culture is much more enthusiastic than the professional stance adopted by *Chip, Enter,* and *PCWK*. I further supplemented these by an issue each of three magazines concerned more with the Internet than just computers - issue 1/2000 of both *Internet* and *.net*, the 1/2001 issue of *WWW,* and a special issue of the *Enter* magazine: *Enter Extra Vademecum PC,* for the total of eighty-eight magazine issues. In the magazines, I have analysed articles dealing one way or the other with computer space, as well as advertisements presenting, often graphically, spatialities of computerized environments. The graphical representations form the bulk of my analysis, as images are particularly suited to representing spatiality (although it is important to remember that non-visual sensory input forms

Before the beginning of magazine analysis, I have been collecting short definitions of space and cyberspace from students at the Warsaw Polytechnics in order to gain preliminary insights into the ways space is construed in computerized settings. One of my respondents defined cyberspace as "space inside a computer," which initially struck me as strange, as I started to think about the screws, cables and internal components tucked inside a computer case. Obviously, however, another interpretation would see in this "space inside a computer" the data worlds, digital landscapes, and perhaps their visualisations shown on the monitor screen. These two concepts (if indeed they differ) are brought together in an advertisement from one of the magazines I have analysed (Chip 6/98: 241; fig. 7.1). It shows a black-and-white, hand-drawn picture of a desktop computer. The lines of the picture are crude and sketchy, relaying only the general idea of a computer. An image on the monitor screen is, however, a colour photograph, as are the

24 I have been unable to locate any later issues of the magazine, though I have been told that it had been published for at least some time afterwards.

internal components shown through a cut-away of the computer's case. The picture shows three different spaces—two inside the computer (screen image and electronic components inside) and one, the physical space, outside the computer (to paraphrase my respondent). This is where the user's body and its interactions (with the computer, among others) are located, and thus I call this space the corporeal one.

As the virtual (onscreen) and the technical (inside the case) spaces are shown in colour and much higher resolution than the corporeal space, the reader is left with the impression of the former two as more real than the space around the computer space. Not surprisingly, Polish computer magazine discourse tends to concentrate on these two, bypassing the users' bodies and physical contact.

Corporeal space

As a first step to subverting this order, I would like to start my analysis with the underprivileged corporeal space. In analyzing press images, I am already one step removed from the actual human bodies and their relation to computers; I can only interpret representations of the human body, as presented in magazines, rather than the body itself and its space.25 Nevertheless, some images and articles refer directly to the human body, and those that don't can also be significant through their omission.

An interesting place to begin the inquiry is with the presentation of children in Polish magazines. Not because so many of them are shown, but because children's bodies are situated in a different relation to computers than adults'. Children appear almost exclusively in adverts - there are a few reviews of programs addressed to children, but even those concentrate on the strengths and weaknesses of the software (and programming) and not on children as such. The one exception is an article devoted

25Part of my field research, described in chapter nine, does, however, involve interaction with actual human bodies, and observation thereof.

entirely to the topic of small children using computers. The space described there is centered on the bodies; children touch and break computer equipment, they experience keyboards as too large and chairs as too low.

Similarly, advertisements depict children in physical contact with computer parts. On one of them, a baby is shown flying through space astride a CD recorder, on another - it crawls over a keyboard and into a monitor screen, one hand reaching out to touch its shining surface. A subtitle explains that it has "stopped crying and now roams the Internet" (*PCWK* 5/99: 143; fig. 7.2). Unwittingly, perhaps, the association of children with unbridled physical closeness to computers suggests that whatever rift separates current users from the technology might not be there for the next generation.

Older users' contact with computers tends to be presented as much less physical. Although many advertisements show people alongside computer equipment, they are almost never actually touching any of the machines. Several ads depict smartly dressed men and women sitting at desks furnished with various computers. A series of adverts (e.g. PCWK 11/98: 146; PCWK 5/99: 23; fig. 7.3) for monitors shows sexy young women standing alongside sleek monitors. Displays on the monitor screens show zoomed in women's faces, shown in greater detail than outside the screens. While standing very close, women never actually touch the monitors.

Elsewhere (PCWK 4/99: 91; fig. 7.4), a lonely executive gazes up from a magazine, or report, that he is reading and out of the window of a sparsely furnished boardroom. It is just about possible to make out an outline of an office building outside the window, and it is towards this building that the executive's gaze is directed. A monitor appears underneath this picture, in the same advert, set against a black background. Advertisement text explains the qualities of the monitor. No mention is made of the lonely man in the picture, and no connection is visible between him and the monitor. Perhaps it would be

wonderful for them to meet, but there is nothing to suggest that they ever did or will. Even the light tone of the top photo contrasts starkly against the black background of the rest of the advertisement, underlining the rift between the man's space and that of the computer. This ad forms one of a series sharing the same layout, and repeating the same scene with different protagonists—different men gaze longingly out of different boardrooms, while different monitors occupy the space beneath the photo. Even more amazingly, a series of printer advertisements (by another company) share a similar layout—black-and-white photographs of human beings on top of the page, with photos of a number of printers set against a red background shown underneath (*PCWK* 11/98: 101; fig. 7.5). Once again, no connection between men (all the people in these advertisements are male) and machines is provided; they just coexist on the same page, though not in the same space. Still another advert (*PCWK* 4/98: 89; fig 7.6) following the same layout shows a human hand holding a carpentry rule against a dark grey background; the lower half of the page has a white background, and shows a monitor and a text praising its quality.

Perhaps the most telling advertisement, as far as the barrier between corporeal space and the space of computers is concerned, shows a group of people26 gathered around a very strangely looking computer case (Chip 5/2000: 60; fig. 7.7). They are all obviously very much intrigued—they lean and crane their necks to get a better view. None of them, however, makes a move to touch the fascinating piece of equipment.

When physical contact takes place, it is appropriately businesslike in nature—typing is by far the most common, although in a few places one sees people handling computers differently. One man uses the same strange-looking computer case as a watering can, holding it in an arm extended away from his body (Chip 5/2000: 37; fig. 7.8). A young

26 They might be clones - they all look the same. Or perhaps we see a rendition of various phases of the same story - it is what one person did in an extended period of time.

couple carry scanners on an exotic beach (*Enter 6*/99: 65; fig 7.9), but the machines are all packed up and the viewer sees only cardboard boxes (maybe they just use scanner boxes to carry something different). The rare people who are shown to actually handle computer equipment tend to be rather plainly dressed in business suits, thus enhancing the formality of physical contact. In one case (*Chip* 5/2000: 11; fig. 7.10), a photo of a very extravagantly dressed young person, wearing bright blue lipstick and a small cleaning brush tied upon his head is definitely not the type whom the advertisers would let touch their equipment, as the slogan explicitly articulates their scorn—it reads "Get serious. Get Aopen [the company name - JK]."

The one seeming exception to this trend shows a Polish pop-star lying in a sexy pose and holding a computer mouse in her teeth (*PCWK* 5/2000: 176; fig 7.11). The mouse is not plugged in, and no other equipment is visible. Text on the advert page testifies to the high quality of one of the Polish Internet portals. This, perhaps, serves as a key to understanding this picture, seemingly so out of place in the context of reserved contacts between human bodies and computers, as evidenced by the other advertisements. The pop-star does not stand for a human body, she represents the virtual world of the Internet. Further analysis of that advert belongs thus in the examination of the virtual space, for now let it suffice to say that the taboo against physical touch between computers and humans is tampered with here, but not really broken.

Aside: sexed computers

I would like to stop here for a moment and take a closer look at this taboo, as well as at the ways in which it is circumvented. My proposition is that computers are presented as sexually desirable, and that touching computers is seen as a sexual act. The first argument in favour of this proposition takes the form of an advert showing a young woman leaning over a computer monitor (*PCWK* 12/98: 69; fig. 7.12). Her body is on the verge of

touching the monitor case, and it is difficult to judge whether actual contact takes place. The monitor screen shows the same scene, and the two (almost) touching bodies (human and machine) are repeated endlessly on the diminishing images of monitor screens. The caption reads "there are things one cannot resist," reinforcing the sexual reading of this scene; a different interpretation, though, could see the same ad as drawing upon another source of "forbidden pleasures" in the Western culture: calorie-rich food—commercials of tasty sweets often feature similar imagery.

Another advertisement (*Enter,* 2/2000: 7; fig 7.13) shows a topless woman standing in front of a projector, which looks remarkably like a camera (a box with protruding camera-like lens). The projector/camera occupies the centre of the picture, with the woman slightly out of focus and to the side. Also, the projector looks like it is half-undressed itself, with plugs and electronic parts visible in recessed areas of its case. The caption reads, "you can see more," and it is reasonable to assume that the gazed-upon object is the electronic device rather than the human body.

Yet another advert (*Enter* 4/99: 158; fig. 7.14) shows two people, a man and a woman, shaking hands over an office desk, as if during a formal greeting. The desk appears to belong to the woman—an office chair is standing behind her, and a monitor placed upon the desk has its screen turned towards her. The man reaches out with the back of his left hand to touch the monitor case. He looks the woman straight in the eye, and they're both smiling. It seems as if the greeting is just a pretence, while the man concentrates on caressing the monitor.

A different ad (*PCWK* 5/2000: 197; fig. 7.15) shows a tough-looking cowboy holding a computer printer under his arm, riding a horse through a prairie. The main caption reads "bounty hunters," and additional text extols the virtues of the printer. The man's grimace is hard to interpret—it might be a grin, but it can also suggest physical exertion. Most

significantly, he appears to have a noticeable erection. Presumably, the pleasure of such close contact with computer equipment (whether any, or just this producer's remains open to discussion) is what arouses him.

Finally, an article illustration (*PCWK* 5/98: 75) is a cartoonish drawing of a man standing next to a computer. The man reaches out as if to touch the machine, while at the same time colourful waves emanate from the computer, violently striking the man, who winces. The monitor screen reads: "WARNING: STAND BACK—EMFS." It looks like an illustration of a successful defence against attempted violence, possibly rape.

In all these images, the computer (or a machine) is postulated as an object of (sexual) desire, and its touch is shown to carry strong sexual overtones. The taboo against showing computer in the act of being touched is thus part of a taboo against the portrayal of explicit sexual acts. The gender of a computer is not defined (in Polish, the noun "computer" carries a masculine grammatical gender)—the sexual act of touching computer parts is not assigned either a homosexual or heterosexual tag, and apparently neither women nor men are immune to its allure.

Children are not perceived as sexually active, and thus it is only they who are allowed to touch computers. An advertisement for easy to clean screen filters (*PCWK* 5/99: 111; fig. 7.17) thus shows a small child wiping the filter with paper tissue. Touch does take place, but it is drained of the sexual tone it would carry if the touching subject were an adult.

Most articles decently refrain from discussing any bodily contact with the user, only the reviews of pointing devices (mice, joysticks, trackballs) mention briefly if the equipment is comfortable to handle. The one article which goes into some physical aspects of computer use is a comparative review of various keyboards, and deals, among other things, with such issues as the strain to joints caused by repeated pounding on keyboard, the proper spacing of keys, and the importance of feeling the right amount of resistance while touch-

typing. The reviewers also perform physical endurance tests of the devices, which includes dropping them from a desk and spilling coffee on them. Another text, entitled "PC and Health" (*PCWK* 5/2000: 62), promises to talk about ergonomics of working with computer, but ends up adopting a highly optocentric perspective, and deals solely with the correct positioning of monitors.

In general, the corporeal space is portrayed as playing little part in the experience of computers, and the user's body tends to be ignored in favour of descriptions dealing with either the virtual or the technical aspects of computer use (apart from the tabooized action of touching computers, which is more hinted at than explicitly shown or discussed). The user him/herself is often shown to be located not in the bodily environment, but in the still mostly optocentric27 virtual space displayed on monitor screens

Virtual space

In virtual space, the users are often shown to be a part of the virtual environment. In numerous ads one can observe various objects flying out of their computer screens—a gamer can be seen to duck before a starfighter stylized to look like Star Wars' X-wing (*Chip* 5/98: 53; fig 7.18), a ski-jumper fly out of a monitor (*PCWK* 5/99: 44; fig 7.19), the Golden Gate bridge lead into virtual space (*Chip* 5/98: 127; fig. 7.20), and a mysterious face gaze from a pool hidden inside a scanner (*PCWK* 4/98: 21; fig. 7.21). A viewer requires a plaster cast on his leg because of a banana peel he saw on a monitor. A ghoulish hand reaches out of the screen to pull the hapless user towards the glowing mists within. Despite the commotion, the user miraculously avoids touching the keyboard (*PCWK* 5/99: 63; fig. 7.22).

27In 1999 and 2000, though, numerous articles started speaking about 3-dimensional sound produced by new soundcards.

Physical space can be often seen mirrored on computer screens, often in a hyperreal way, that is looking more real than the original ever did—black-and-white people are granted colourful renditions on monitors, and blurred images achieve sharpness by being displayed on appropriate screens. Printouts of electric fans are supposed to suggest to the reader to reach for a comb to smooth down his/her hair ruffled by the breeze (*Enter* 2/99: 13; fig. 7.23). The number of simulacra employed in such messages is truly staggering—a printed image of a printed photo of a fan is set against a printed photo of a comb; the former represents printer's performance, the latter—outside reality.

As I have already mentioned while discussing the corporeal space, it is in the virtual world of cyberspace that human bodies can be shown as active and interactive. Bodily presence has been divorced from the body (which remains in the corporeal space) in order to be able to manifest within the discourse of computer press. A transvestite wearing full make-up can be seen to shave (*Chip* 5/2000: 21; fig. 7.24), but only on a (printed image of a) monitor screen; an already discussed woman dressed in black leather and wearing an anarchy sign is able to kick out screaming as long as she remains much more a part of violent action exploding from her screen than of the corporate world hosting dull-looking computer sets capable of displaying such mayhem. In a violation of the taboo against touching computers, she can even sit on a computer case while kicking out (though this is not apparent at first sight), although the effort does require some strange physical contortions. In an already mentioned advertisement, a sexy pop-star gnaws on a computer mouse. The bodies of virtual space are allowed to carry strong sexual and emotional overtones, improper in the corporeal setting.

Throughout magazine articles, corporeality is mostly a feature of virtual experiences—it is there that one can "enter [one's] favourite golf shop" (*Internet* 1/2000 p. 39) or embark on a "journey for a document" (*Cyber* 8/98 p. 74). In a text dealing with e-commerce, the reader learns that "unfortunately, some of the shop owners probably did not anticipate a

large number of clients, and have set up the shops on low performance servers. In effect, we could not enter some of the commercial outlets at all" (p. 15-16). One Internet bookshop is criticized for not having a shopping basket available for the clients, which means that the product s could only be bought one at a time.

In the above cases, spatial terms are used extensively to describe computer-generated data, and interaction proceeds in ways mindful of bodily presence, much more so than in the discourse on what I call the corporeal space. Limitations, when noticed, are shown as linked do specific technical weaknesses of representation of the human body in virtual space rather than to the general metaphor—among criticized features are slow links, low transfer rates, and a limited repertoire of actions available in a VRML28 world. Only one article describes the imagery of the net as essentially a vision with little or no hope to be ever matched by lived experience.

The symbolic transfer is considered legitimate only one way - transferring physical imagery onto a virtual world. The opposite trend is usually simply absent from the computer magazine discourse, but when it is noticed, it is met with scorn and distaste as in the following example: an editorial, mindful of the gaping rift between the computer space and the corporeal reality, set out to make fun of the inept attempts to cash in on the industry buzzwords:

> The road to the 21st century is the silicon I-way. But what about those, who would like to join the future elite, but are afraid of gigabytes and megahertz? It is enough for them to buy virtual jeans, a multimedia TV set, and to love a tamachicken (*Chip* 1/98: 46).

The scorn is somewhat unfounded, in that the e.g. the word multimedia describes just as well most of television as well as computer productions. The multi- of multimedia is

28Virtual Reality Markup Language - a language for describing digital landscapes to be displayed on a computer screen

actually two—sight and sound, with the third sense, touch, only very slowly becoming available to computer users; the world was as much hype when it was used for selling computers and computer products as it is when selling TV sets. This doesn't stop the article author from being scornful and condescending for using lofty computer computers to promote lowly, "corporeal" products. Which of course involves forgetting that many of the important computer concepts (e.g. memory, virtuality, disk space) are not native to computer systems, but rather taken out of their original contexts and incorporated into the computer discourse. The push of the article is obviously ideological; it involves privileging virtual space over other possible kinds of experience, and underscores uniqueness of cyberspace and its incompatibility with other modes of living.

The virtual space was highly present in advertisements in all the analysed magazines, but although all of them contained some articles discussing this space, *Cyber* was by far the most enthusiastic and the most immersed in a spatial discourse of cyberspace. Others tended to be much more critical towards the achieved virtuality, and their descriptions lean towards technical rather than spatial wording. In an extreme example, a comparative review of numerous 3D cards (claiming to be the most comprehensive review published in Poland) carefully avoided all wording associated with virtual space, and settled instead for "3D effects" and the "execution of 3D functions," spiced up with plentiful technical data of all the analysed cards (*Enter* 7/99: 36-40).

At the same time, the spatial language remains in use when dealing with the virtual, and advertisement images show human bodies as important agents throughout cyberspace. It is obvious, though, that no equivalence exists between the leather-clad, kicking and screaming bodies of cyberspace and the mild-mannered, coffee-sipping bodies dressed in bland suits that inhabit corporeal space as represented throughout the magazines. Seductively sexy (the pop-star) or nonchalantly subversive (the transvestite) bodies are also quite clearly distinct from the subservient models or blundering children. In order to

honour these dissimilarities, as well as the connections between cyberspace and spirituality (Davis, 1998; Wertheim, 1999), I shall call the bodies from virtual space the astral bodies. Their function is to act as receptacles for feelings and passions excised from the corporeal world as presented in the magazines' discourse, and to give expression to these feelings in the virtual world, free from the constraints imposed by the dominant forms of corporeality. Emotions and desires brought in by and expressed through astral bodies is what makes me see the magazines' portrayal of the virtual space as not fitting the label of mind-space I have previously assigned to the digital world. It seems more fruitful to see this space as representing the spiritual part of human existence.

I cannot at this time say if the excision of emotions into virtuality is a general characteristic of computerized spaces, or whether it is limited to the Polish context, where one can witness a turn towards prudery if not outright Victorian sensibility (Graff, 2001). Hyperrealistic and special effects-laden depiction of virtual space in such films as *Johnny Mnemonic* and *Matrix* would suggest the former; particularly *Matrix* is interesting in that regard, as Neo, the protagonist, transforms from a well-behaved, suit-wearing corporate employee into a leather-clad rebel bent on destruction upon learning that the world he knows is, in fact, a complex virtual reality. As the studied field material is limited to Polish magazines, however, I am barred from reaching any definite conclusions in the matter.

Technical space

The third space of computer discourse tends to remain in shadow of the two already described, and indeed, it was not included in my starting model based on the dichotomy between physical space and cyberspace. However, its presence in the magazine discourse is unmistakable, and its form of narration quite different from that of the other two spaces. The absence of technical space from my initial consideration can be seen as stemming from the relative lack of technical detail in the visions of cyberspace I have explored before

turning to computer magazines. Nevertheless, its traces can be found in the detailed measurements of the Void that Binds—the medium the transmission of data in the cyberspace of Dan Simmons' *Hyperion* series (1989/94), as mentioned in chapter four of this work. The reader is given the exact dimensions of the Void that Binds, derived from Planck's constant, and necessary for imagining it as a technical space.

The imagery of the technical space presented in the analyzed magazines consists mostly of computer components and of graphs illustrating performance of various systems. This space deals with accurate measurements, though units vary from micrometers to gigabytes to bits per second. In all the magazines, detailed and extensive tables of various electronic products' technical parameters comprise a significant part of many articles. Advertisements also often cite extensive technical data of electronic computer equipment. The electronic, or rather electric is an important adjective here, for it seems that only plugged-in peripherals are of any interest to the computer press. Computer-related furniture (desks, chairs), mouse pads, and desk lamps (which are electric, but not *directly* connected to computers—or rather, connected to the computer only through the power grid) do not receive a mention, while UPS (uninterrupted power systems), mice, and loudspeakers are all treated to extensive reviews, even though one could argue that their importance to computer usage is similar. The one exception to this rule is a review of monitor filters (which are unpowered and do not need to be plugged in anywhere) featured in one of the magazines.

One can thus infer that this connectedness is an important feature in determining the boundaries of computers. Obviously, this does not necessarily mean cabling—a few articles enthusiastically mention cable-less infrared connection used for data exchange (though, once again, between electric machines). A possible explanation would link this phenomenon to the high-tech image that computers (and to an extent, still, also

electricity—cf. Adrian Forty, 1986) carry, and indeed, the layout of the magazines and adverts tends to towards a futuristic aesthetic.

Another symbol of cutting-edge technology is the conquests of space and, not surprisingly, some advertisements exploit such imagery. A few show computer parts hurtling through outer space (e.g. *Chip* 5/98: 259; fig. 7.25); it is interesting to note that often the parts are bare components with various chips and circuits sticking out of them, which probably enhances the high-tech symbolism. A different advert shows an astronaut in full spacesuit posing against the sun, as well as a seemingly unrelated hard disk drive. The blurb warns that "even if you are not an astronaut, your life depends on the data you gather" (*Chip* 7/98: 99; fig. 7.26).

As I have already mentioned, children feature in a few advertisements as yet another symbol of the future. As asexual beings, they are allowed to touch the equipment strictly off limits for older people. Not only are they allowed to touch and crawl over computers, but they can also touch chips and circuit boards that is never even shown on the same illustration as adult bodies (except for the assembly context, as described below)—one advert shows a group of definitely childish imps hopping around on a circuit board (*Enter* 10/99: 173; fig. 7.27), playing tug-o-war with a crumpled page from some corporate report. Not surprisingly, old people are largely absent from the advertising discourse (though a few articles deal with Internet resources pertaining to old age and ageing) - the only ad showing an older woman has her pretend to be a sexy young woman in an Internet chat.

Two links are visible between the technical space and the corporeal one. One of them is provided by various DIY component assembly tutorials. These are often accompanied by illustrations showing step by step the installation procedures, and often concentrate on the physical actions needed to unscrew, stick in, plug in or glue on particular components.

Many photographs show human (male) hands connecting computer components, inserting plugs, and setting jumpers (e.g. *PCWK* 5/2000: 69; fig. 7.28). It can be argued that this physicality is present only before computing starts—after the virtual space has come into being (following the boot-up of a successfully assembled/upgraded computer), physicality vanishes to be brought back only in the event of a much dreaded hardware failure. Nevertheless, these events take place in the realm of the discourse offered by computer magazines, and thus the appearance of the body (or parts thereof) is a significant event that needs be noted.

The second link deals with a rare appearance of the technical body—a body constituted through the discourse reserved for technical space. Its description comes from an article describing e-commerce:

> If we trust statistics, [it appears that] a typical model client of an Internet shop "walks out" of it in a new cotton t-shirt, gazing "coolly" from above his glasses. In his hand, he holds a book or a CD album, and his pocket stuffed with software (worth usually under $50) can barely hold an airline ticket. For all this to make sense, we need to add that this client is a young (30 at most) American male (definitely Caucasian), who spends 20 to 30 hours per week in front of a computer screen" (*Cyber* 3/98: 15).

The body is neither a corporeal one, nor the astral one driven by passions and emotion. It exists only in cyberspace, possesses no individual characteristics, but neither it is communal—it is just an abstraction, and it could plausibly be designed in the same way that computer chips and circuits usually are—to fit the specific needs of a system.

Indeed, the technical space is very strict about fitting in—an article using pseudo-statistical language (*Enter* 2/99) informs the reader about dangers of variation in mean time between failures of hard discs. Another article on the same subject (*PCWK* 9/98) stresses the large number of parameters important for evaluating a hard drive.

Technical space of computer magazines capitalizes on rationality, quantifiability, and predictability of the objects that inhabit it. It relishes in orderings, classification, and tabular comparisons. Neither the corporeal body, nor emotional spirit have a lot in common with the subjects of technical space. It seems logical (and logic is also held in high esteem in technical evaluation) to assign this spatiality to the domain of the main, the same one that the magazines' cyberspace failed to inhabit.

Timeline

In the period subject to analysis I have noted no major changes in the content or presentation of examined magazines which would prevent me from treating the study as synchronic and require examination of emergent trends. A few changes, however, have taken place - at around the beginning of 1999, there was a significant rise in the interest taken in the rendition of sound, mostly due to the appearance of new sound adapters providing various implementations of 3D sound, that is providing an illusion of sound coming from different places than the actual location of the loudspeakers (or headphones). This development, and particularly the directing of media attention towards aural phenomena, introduces aurality into the heavily optocentric cyberspace discourse. As Steven Feld (1996) argues, limiting landscape to just vision robs it of many aspects constitutive to the perception of a place. We have large vocabularies for describing optical spatiality,

> [b]ut what of place as heard as felt? Place as sounding or resounding? In contrast to the long history of the landscape idea in both artistic and scientific inquiry and representation, approaches to ways in which worlds are sonically apprehended have shallower histories (p. 95).

Inclusion of soundscapes in the discussion of cyberspace can be seen as an important step in allaying the placelessness of cyberspace (Arefi, 1999), as epitomised in William Gibson's (after Gertrude Stein) quip "there's no there, there" (1988: 48). Another development in

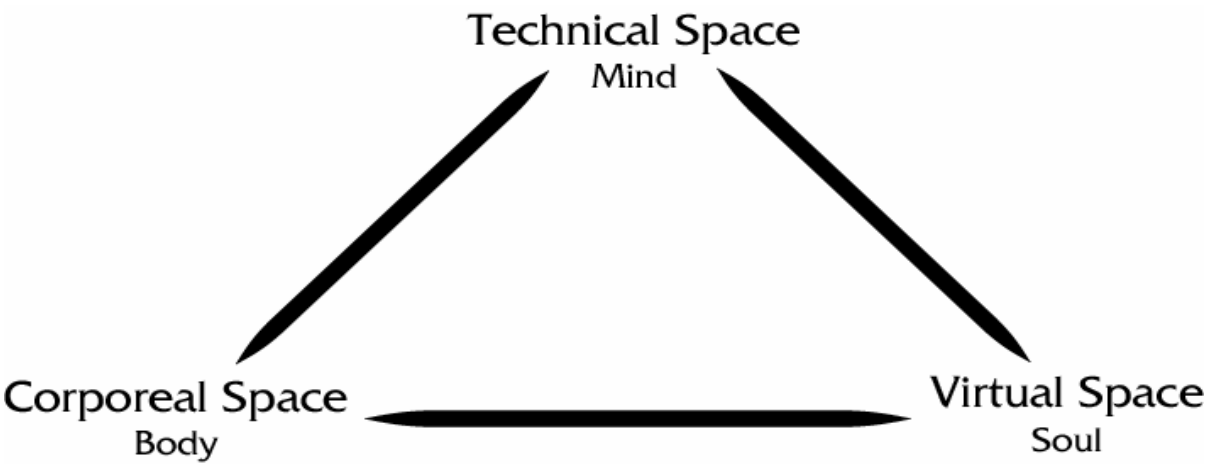
non-optical perceptions of cyberspace, the relatively new “force feedback” game control devices (which vibrate and change resistance according to the circumstances of the virtual world presented onscreen) hope to introduce touch as yet another sense capable of experiencing virtual space.

With the end of 1999, with the continuing advertisements of Internet-related services started pouring in - portals, search engines, Internet service providers. All the magazines published comprehensive explanations of major Internet-related issues, once again mingling technical data and virtual space: the reader learns that a portal “has to accustom its users to... its own way of navigating dark corners” (*Internet* 1/2000: 24)29, that Internet page catalogues “serve the role of compasses on the net” (p. 23), and is shown various algorithms of paying in Internet shops.

Three spaces

Identification of the third space—the technical space, leads me to reformulate the initial straightforward dichotomy of physical versus virtual, or body versus mind. There is still ample reasons to identify corporeal space with the body, even though another, astral body has appeared in the virtual space. But the nature of the virtual can no longer be equated with the rational mind, as feelings and passions can be seen to nest within its folds. Rather, drawing upon the ideas of Margaret Wertheim (1999), I would assign to the virtual space the label of spirit—responsible for passions as well as for enlightenment. The technical space, however, with its logic of numbers and measurements, can be easily conceptualized as the seat of the rational mind. The diagram of computer discourse spaces could thus be presented as follows:

29This statement seconds Marcos Novak's (1991: 239) observation that "[w]e will adjust to cyberspace far more easily than cyberspace will adjust to us."



Instead of one rift, dividing line, or perhaps some other form of interplay between the physical and the virtual, there are at least three boundaries that can be gleaned from this model; more, if one realizes that discontinuities can now be observed not only between doubles, but between all three spaces as well.

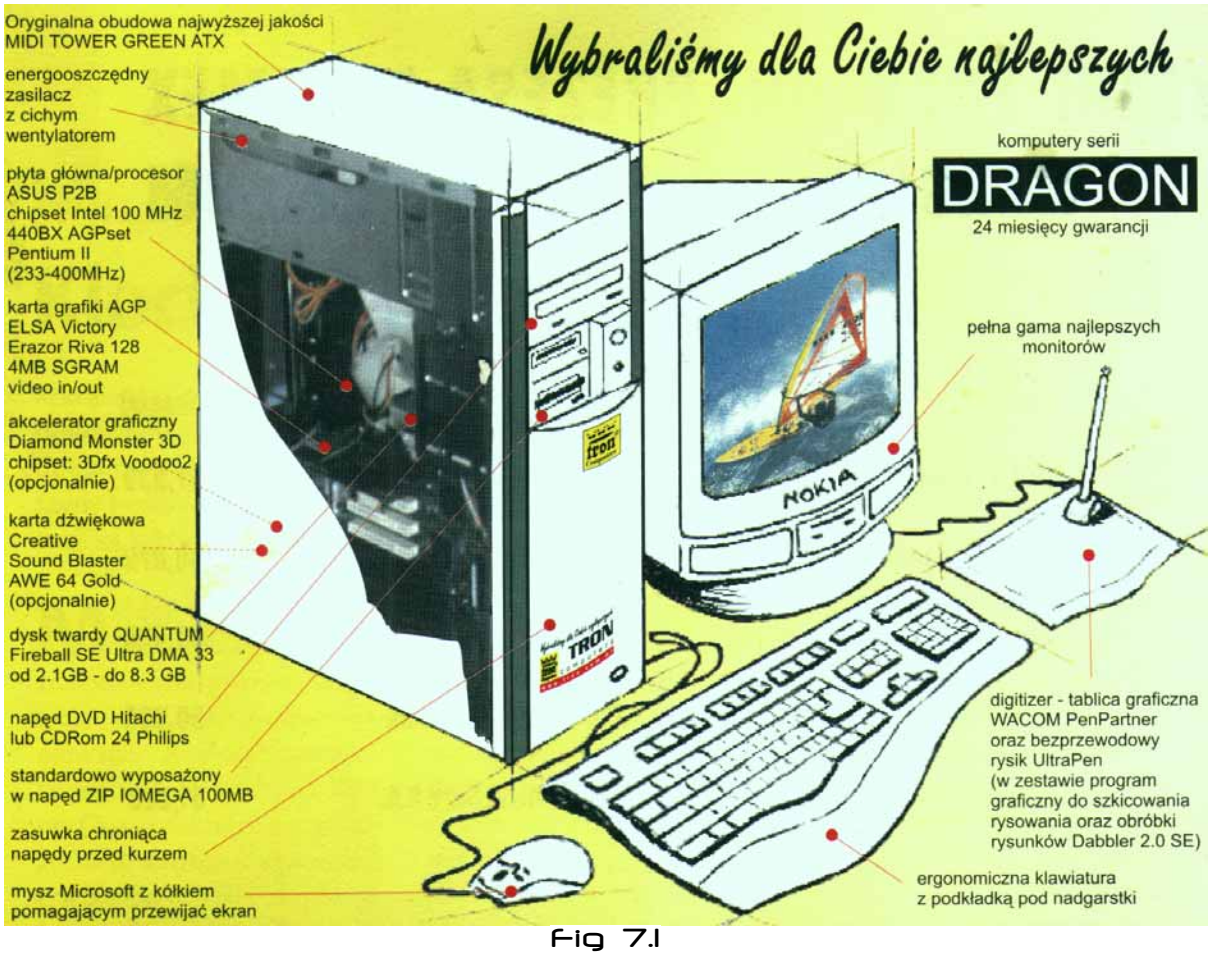
Comments

The most interesting feature of the discourse on computer space as presented in Polish computer press is for me its positioning of the human body. The said positioning can be seen as consisting of two processes. One of them strives to excise all traces of the corporeal subject from the vicinity of computers. Taking to heart the first visualization of the interplay of computer-related spaces presented in this work, it posits an absolutely rigid boundary between the physical and the virtual, the body and the mind. This is the process responsible for all the human beings keeping respectful distance from the computers in advertisements; it is also the dominant discourse in *Chip, PCWK,* and *Enter* articles. It sees computers as belonging to the mind side of the Cartesian mind/body dualism, and does its best to ignore most of the unruly manifestations of the body - weary eyes, aching back and hurting wrists.

The second process is informed by the triadic logic, and is responsible for displacing the astral body into cyberspace. It perceives the virtual spaces as a fully physical place capable

of dazzling all the senses and effectively transporting the user from his/her body into cyberspace. This is the strategy adopted often by *Cyber* magazine as well as by a majority of advertisements, one of which boasts: "the point is not only to have access to the Internet, but to be in it!" (*Enter extra*: 84). It is also conducive to the proliferation of unremarkable, boring, bored, and generally well-behaved bodies on the corporeal side of the divide, left aimless and powerless by the loss of their misbehaving astral bodies, transported to the make-believe world of cyberspace.

Both processes coexist and coincide, and the magazines' discourse is a product of their coincidence. They both contribute to abandoning the corporeal, and so it is easy to see why only "plugged in" peripherals are subject to discussion—the rest are simply too strongly attached to the human body, and have no place in the disembodied mindscape, and neither are they part of the spiritual trek of the astral body through the limitless stretches of cyberspace. Nevertheless, the repressed corporeality continues to reappear every once in a while, often enough to assume that its absence is not as complete as the magazines' discourse would let us believe.


Wybraliśmy dla Ciebie najlepszych
Oryginalna obudowa najwyższej jakości MIDI TOWER GREEN ATX
energooszczędny zasilacz z cichym wentylatorem
płyta główna/procesor ASUS P2B chipset Intel 100 MHz 440BX AGPset Pentium II (233-400MHz)
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mysz Microsoft z kółkiem pomagającym przewijać ekran
komputery serii
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digitizer - tablica graficzna WACOM PenPartner oraz bezprzewodowy rysik UltraPen (w zestawie program graficzny do szkicowania rysowania oraz obróbki rysunków Dabbler 2.0 SE)
ergonomiczna klawiatura z podkładką pod nadgarstki

Fig 7.1

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Fig 7.2


CTX
SHORT TUBE
Przestrzeń w każdym calu.
Przestrzeń, funkcjonalność, doskonały obraz to tylko niektóre z zalet monitorów CTX serii Short Tube. Dzięki skróconemu, płaskiemu kineskopowi, Short Tube są rozwiązaniem dla osób, które pragną pracować na dużym ekranie zachowując niezmienioną ilość przestrzeni wokół siebie.
Monitor Short Tube o 17 calowym ekranie potrzebuje tylko tyle miejsca na biurku, ile standardowy monitor 14 calowy!
W monitorach tej serii zastosowano również najnowsze rozwiązania komunikacyjne hub USB, który pozwala na jednoczesne podłączenie do komputera dużej ilości urządzeń.
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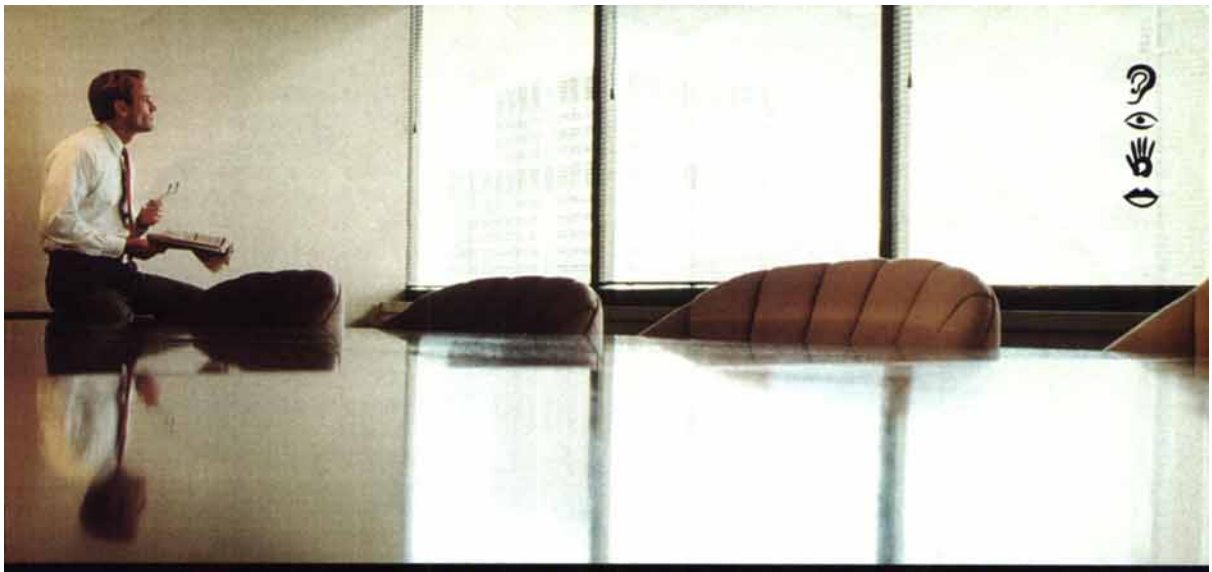
S.A.

Fig 7.3



SONY

CHIP TIP Październik 1998 POWER

Niech mój monitor będzie oryginalnym monitorem Sony Trinitron

Bez wątpienia chcę jakości, na której można polegać. Produktu z dobrym „rodowodem". Marki, której ufam. Od producenta, który stworzył technologię Trinitron. Wszyscy użytkownicy monitorów w domach, biurach i studiach graficznych znajdą wśród najnowszych modeli Sony najlepszy dla siebie monitor. Nowoczesna technologia zastosowana w monitorach komputerowych Sony, czyli super płaski kineskop, doskonała ostrość oraz wzmocnienie funkcji graficznych są gwarancją obrazu najwyższej jakości. Monitory Sony wyprzedzają ogólnie przyjęte standardy. Poza tym Sony oferuje trzy lata gwarancji. Dlatego wybieram oryginalny monitor Sony Trinitron.

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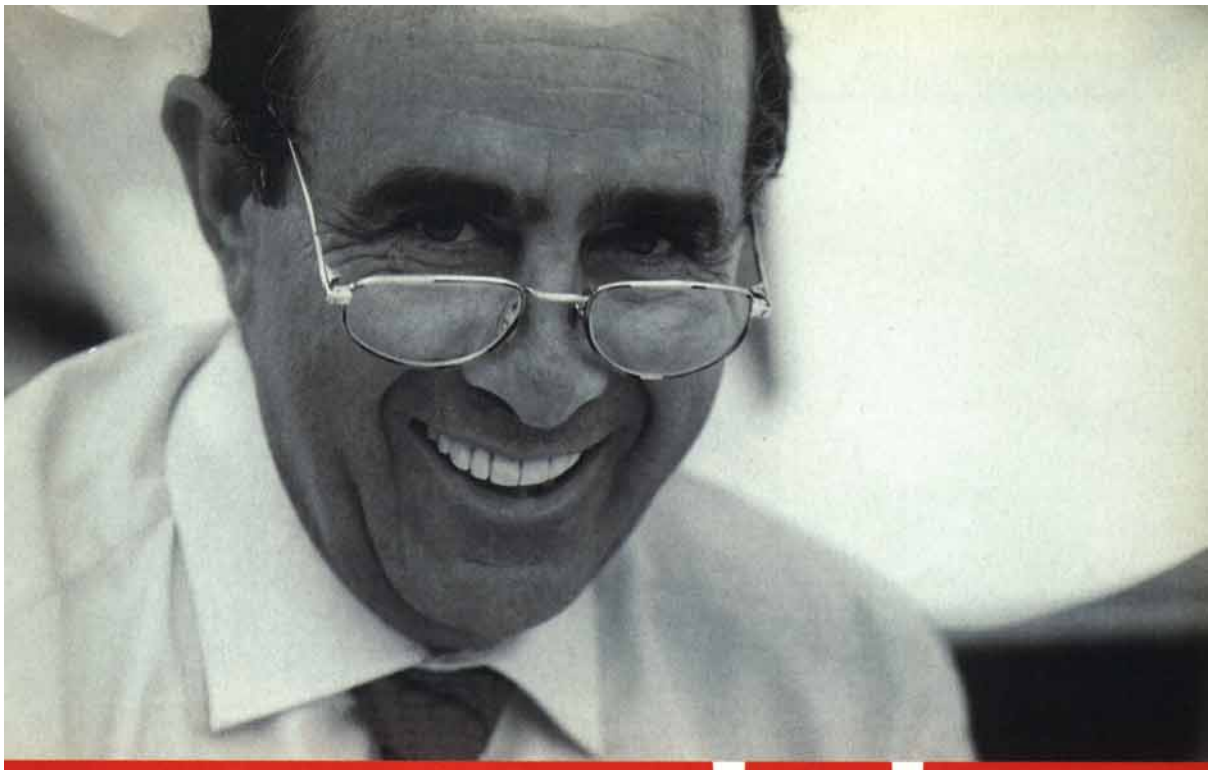
Zapraszamy do odwiedzenia naszej strony w Internecie: www.tornado.com.pl

Fig 7.4



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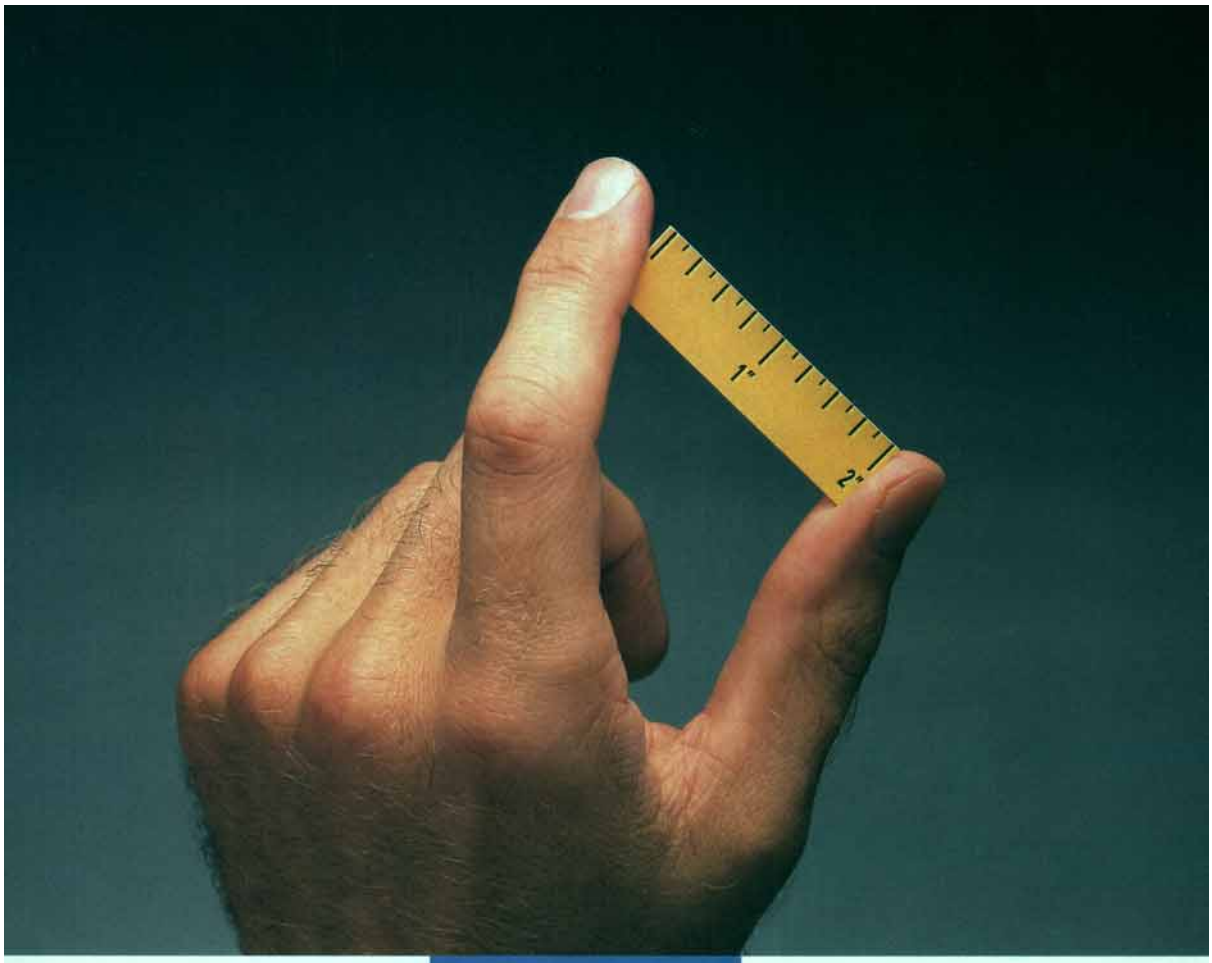
OKI
People to People Technology

Fig 7.5



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NOKIA 447ZA

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Fig 7.6

Nowy ADAX
Zadziwi wszystkich

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Najnowszy ADAX najpierw budzi zdziwienie, a potem podziw! Jako pierwszy w Polsce pojawia się w nowej, awangardowej obudowie typu FLEX ATX. Idea Flex ATX to mniejsze wymiary płyty głównej, mniejsze wymiary kart rozszerzeń oraz ich maksymalna integracja z płytą główną. Dzięki temu komputer może przybrać niemal dowolne kształty i kolory. Najnowszy ADAX Bravo Flex w żaden sposób nie jest podobny do tradycyjnych komputerów. Po prostu zadziwia Cię jeszcze bardziej.

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otrzymał **GRAND PRIX** dziennikarzy
na targach Komputer Expo 2000

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Fig 7.7

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Zadziwi wszystkich

Najnowszy ADAX najpierw budzi zdziwienie, a potem podziw! Jako pierwszy w Polsce pojawia się w nowej, awangardowej obudowie typu FLEX ATX. Idea Flex ATX to mniejsze wymiary płyty głównej, mniejsze wymiary kart rozszerzeń oraz ich maksymalna integracja z płytą główną. Dzięki temu komputer może przybrać niemal dowolne kształty i kolory. Najnowszy ADAX Bravo Flex w żaden sposób nie jest podobny do tradycyjnych komputerów. Po prostu zadziwia Cię jeszcze bardziej.

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**w trybie suspend to RAM*

Ilość zestawów w promocji ograniczona.

Ceny i konfiguracje mogą ulec zmianie.

Fig 7.8


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Ona SEKRETARKĄ,
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Fig 7.9


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Fig 7.10


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Fig 7.11


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Fig 7.12


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Fig 7.13


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Fig 7.14


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Fig 7.15

Fig 7.16

Dziecinnie proste

Firma 3M opracowała unikatową powłokę, która zabezpiecza filtry przed plamami tłuszczu, atramentu, napojów i odciskami palców. Czyni je znacznie mniej widocznymi i eliminuje potrzebę użycia środka czyszczącego. Zwykła, miękka, sucha szmatka zmywa je z łatwością. W przypadku uciążliwych plam można użyć zwilżonej ściereczki.

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Antystatyczne
Modele charakteryzujące się tą cechą posiadają przewodzącą powłokę połączoną z elastycznym przewodem uziemniającym.

Prywatyzujące
Dzięki unikatowej technologii mikrożaluzji firmy 3M dane wyświetlane na ekranie są niewidoczne dla osób nie znajdujących się bezpośrednio przed monitorem.

Antyodblaskowe
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3M *Innowacje*

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#do 64 MB pamięci tekstury
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Fig 7.18

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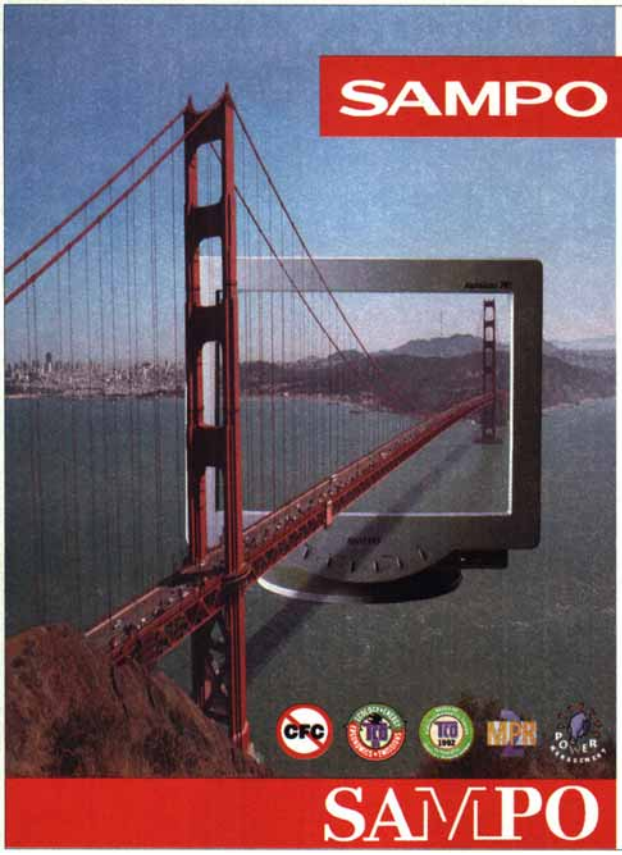
Fig 7.19



SAMPO - WŁAŚCIWY PUNKT WIDZENIA

Kupując komputer musisz także pomyśleć o monitorze. Przecież co dzień będziesz wpatrywał się w jego ekran kilka godzin. Dla Twoich oczu ważna jest jakość obrazu, dla kieszeni rozsądna cena. Jak pogodzić wysoką jakość z przystępną ceną? Jest na to tylko jeden sposób: SAMPO.

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KM520SDL - 15"	0,28 mm	1280 x 1024	30 ÷ 70 kHz	50 ÷ 120 Hz	110 MHz
KM711DL - 17"	0,28 mm	1280 x 1024	30 ÷ 70 kHz	50 ÷ 120 Hz	110 MHz
KM761B - 17"	0,25 mm	1600 x 1200	30 ÷ 86 kHz	50 ÷ 120 Hz	135 MHz
KM810DT - 19"	0,26 mm	1600 x 1200	30 ÷ 95 kHz	50 ÷ 150 Hz	210 MHz
KM950DT - 21"	0,28 mm	1600 x 1200	30 ÷ 95 kHz	50 ÷ 160 Hz	210 MHz

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Fig 7.20

GŁĘBIA ŹRÓDŁO INSPIRACJA

rozdzielczość optyczna: 1200 x 2400 dpi;
gęstość optyczna: 3,6 D; głębia koloru: 36 bit.

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Fig 7.21

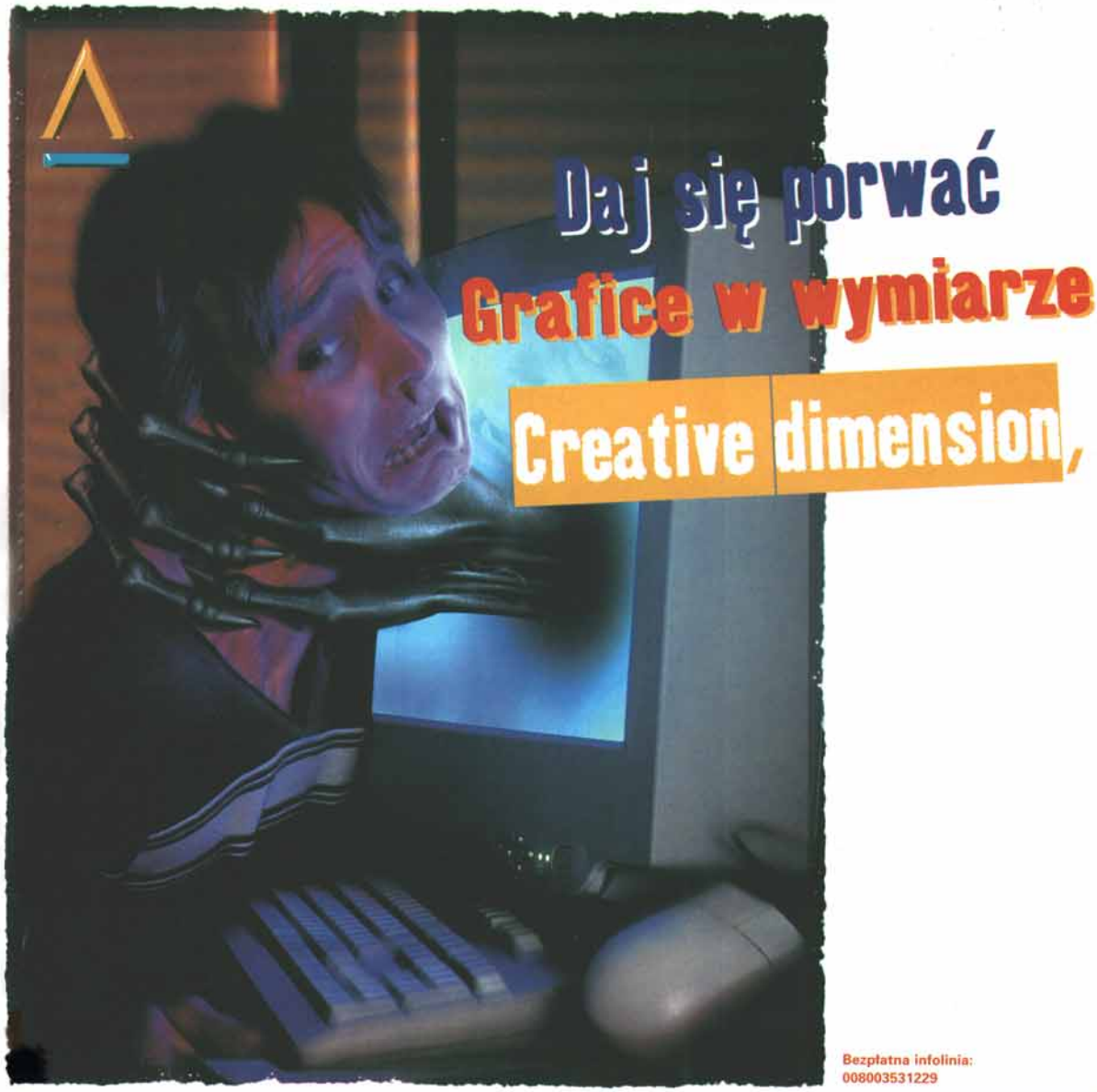

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Fig 7.22

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Fig 7.23


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Fig 7.24

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Millennium II

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Fig. 7.25


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Fig 7.26

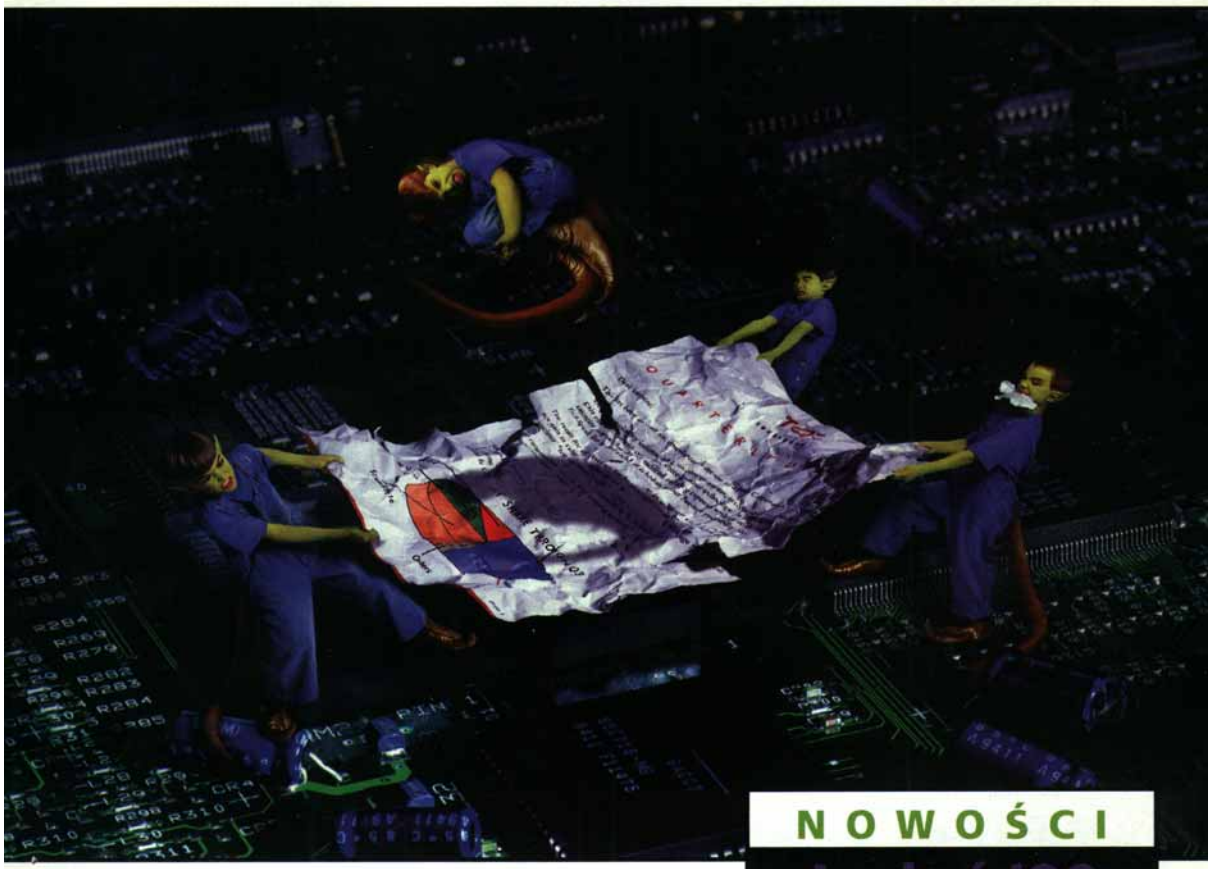

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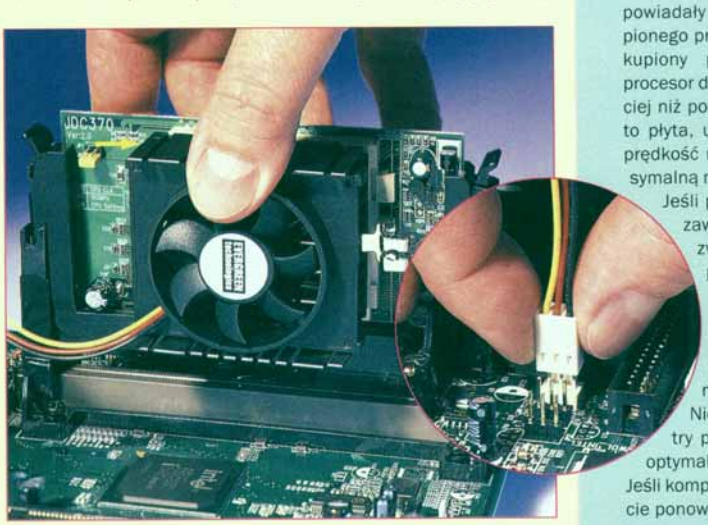
Fig 7.27

Rozbudowa do Pentium II

1 Komputery z procesorami Pentium II są zasilane nawet po wyłączeniu, dlatego należy wyjąć wtyczkę komputera z gniazdka sieciowego. Zdejmijcie pokrywę komputera. Jeśli procesor jest wyposażony w wentylator, odłączcie jego zasilanie, jeśli ma tylko radiator, zdejmijcie go. Nie będziecie musieli go ponownie używać, ponieważ nowy procesor będzie wyposażony w radiator.
Procesor przytrzymywany jest w uchwytach niewielkimi zatrzaskami zwalnianymi za pomocą dźwigni. Należy je obie odchylić, a następnie ostrożnie wyjąć procesor, kołysząc nim, gdyby był zaklinowany.

2 Wyjmijcie nowy procesor z pudełka. Umieśćcie delikatnie procesor w gnieździe, a następnie zdecydowanie wepchnijcie, tak by zadziałały zatrzaski. Podłączcie wtyczkę zasilacza wentylatora do płyty głównej.



3 Płyta główna może wymagać ustawienia zworek definiujących prędkość procesora. Ustawcie je w taki sposób, by odpowiadały prędkości zakupionego procesora. Jeśli kupiony przez Was procesor działa szybciej niż pozwala na to płyta, ustawcie prędkość na maksymalną możliwą. Jeśli płyta nie zawiera zworek, prędkość ustawia się za pomocą dołączonego programu narzędziowego. Procedury mogą się różnić w zależności od producenta. Niektóre płyty same wykrywają parametry procesora i automatycznie ustawiają optymalne parametry.
Jeśli komputer po włączeniu nie działa, spróbujcie ponownie wyjąć i włożyć procesor.

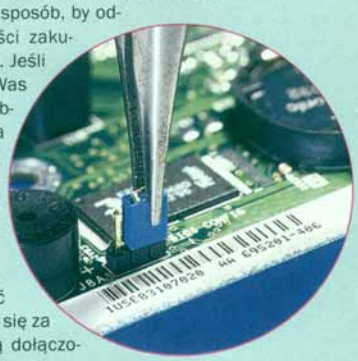


Fig 7.28

Chapter 8: Narratives of Computerized Spaces

Overview

In the previous chapter, I examined the discourse of Polish computer magazines, trying to pinpoint the various spaces represented there. I did it by providing my own reading of the material, drawing upon the techniques of text analysis to bring out the dominant themes binding computers, their users, and space. Even though I tried to illustrate the material by including quotations and pictures from the analyzed magazines, the interpretation remains a highly personal endeavour, influenced by my own assumptions and associations.

Admittedly, I do not perceive it as necessarily a drawback. Writing a thesis is a personal interpretive endeavour, and impersonality is only a rhetorical strategy (Wolf, 1992). At best it is a smokescreen that hides, but does not obliterate, authorial intent and interests, at worst it just makes the text duller. Therefore, in order to mitigate some of the one-sidedness of the approach consisting of interpretations that are only my own, I decided to strive not for impersonality, but multivocality. To achieve it, I turned towards other people for their interpretations of the material presented in Polish computer magazines. Mostly, they were computer-literate students of management. This was a deliberate choice, and I would like to explain briefly the reasons that led me to ask these particular people for help in my research.

The first of these was obviously the matter of access. Not only did I have the opportunity to ask a group of students to devote some time to participate in my study, but I could also provide something in exchange—insights into the field of organizational ethnography (and cultural studies in general), something that might be useful to them in the course of their further studies. This way, I could collect the material I needed without establishing an

exploitative relation with my informants—something which, I believe, is an important consideration.

The second, and more important, reason had to do with the trajectory of my research. Whereas the analysis presented in the previous chapter was conducted from the point of view of the "professional stranger," i.e. an anthropologist (Agar, 1980)[30], the ideas that I explore in this chapter come from a position somewhat closer to the computerized environment and the spaces connected to it. The authors of the stories that form the basis of the study presented here tend to be involved in various relations with information technology, but at the same time, these relations rarely constitute a significant part of their identity. As such, they form a middle ground between my own outsider approach from the previous chapter and the very tight bonds coupling technology and the IT scientists on whom I focus in chapter nine.

It is important to keep in mind that examining computer magazines, or their discourse, is not the focus of my study, even if it constitutes the means of research in both the previous and the current chapter. Instead, my focus is on how space is constructed in relation to computer technologies, and magazines serve only to provide material for such an exploration.

But there is an important difference between how I looked at them in the last chapter and my current stance, as I have already noted. Here, I analyze stories inspired by magazine advertisements, not the actual magazine contents. The methodology I use here is geared towards finding answers not readily available to direct questioning, foregrounding issues that are not usually reflected upon.

[30]My own experience with computerized settings (however brief or extensive) did not form the focus of that analysis, and I used the framework of my analysis as a tool for distancing myself from the field.

I first encountered a similar problem in an earlier project, when I was trying to learn about the social role of computers. It turned out that a culturally correct answer ("computer is, to me, just a tool") was readily available to all my interviewees. Indeed, they often offered this assertion even when I did not ask a direct question about their relation to a computer. I soon discovered that my problem lay in how to ask sufficiently oblique question that provided my interlocutors with an opportunity to elaborate on their rather complex stances towards computers rather than condemning them to the culturally sanctioned platitude.

Story collection has proven a potent tool for resolving such problems, providing a way of examining basic cultural concepts that are rarely explained in response to straight questions. Barbara Czarniawska and Grażyna Kranas used it to look for conceptualizations of power (1991), and Monika Kostera employed it to explore the ideas of spirituality (2001) and control (2002). My own analysis concerns a similarly nebulous notion of computerized spaces, and thus story collection was a natural choice for this stage of my research.

There are obviously many ways of eliciting stories, and the one to be used can be tailored to the needs of a particular study. One can simply provide a topic for a narrative (Czarniawska and Kranas, 1991), write a beginning of a story (Kostera, 2001), or provide a full story and ask for interpretation (Czarniawska and Calás, 1998). All of these techniques can serve as useful means of obtaining relevant research material. My own approach has been more visual than the purely textual lead-ins described above, which has to do with my topic—space. For space is constructed, experienced, and described largely through visual means, and gaze remains a privileged sense (Berger et al, 1972/97; Komins, 2001). Of course, once again, I do not attempt to grasp an abstract, ideal, and overarching concept of space, but rather the common feature of many spaces of Western culture, particularly those related to computers.

It is not an accident that computers have from the start (that is, from the 1940s) communicated their messages to humans via optical means—they printed or displayed information for the user to see. At the same time, they received information by the sense of touch—perforated cards and tapes, buttons, and keypresses. Such an arrangement reflected not only the technological possibilities, but also ideological hierarchy—gaze is commonly used to establish domination, to define proper relations, to differentiate the subject (who looks) from the object (which is looked at) (Denzin, 1991). The computers' growing sophistication, social acceptance, and position as important actors was accompanied by their acquisition of new ways of receiving data—electromagnetic, infra-red and, finally (and recently), optical.

My inclusion of the visual aspect took the form of using advertisement images as the basis for stories—I have been showing full-page ads from Polish computer magazines to various groups of students, mostly management, and asking them to tell me a story about these pictures. I told them to imagine that they come across an illustrated book, browse through it, and find the picture that I am showing them inside. Then I asked them to imagine the story that they would find in this book, and then to summarize this story; they were to concentrate on the images, but were free to use or disregard the advertisement text as they saw fit. They had ten to fifteen minutes to think and perhaps discuss the possible narratives. Depending on the size of the audience I asked them to devise the story alone or in groups, and then to present it aloud. This can be seen as a drawback in that the first presentation can set the tone for the rest, but it is also beneficial in allowing me to give something back to the group—the first tentative interpretation which can show how one can to go about the process of examining stories collected in such way. Such interpretation has, obviously, little to do with the much more comprehensive examination forming the basis of what I present in this chapter, and served only to show some techniques that can be used in similar research projects. Each time, before asking for narratives, I outlined

briefly the ideas behind my study, stating my interest in spaces around and associated with computers.

All in all I collected fifty-eight stories. Around half of the stories were presented in English by students enrolled in an English-language management studies, the other half were originally in Polish and have been translated by me. The translation was somewhat problematic because some stories made extensive use of punning—I translated these to the best of my ability, adding notes when I found it impossible to preserve both the meanings and the tone. As the stories were presented orally, the language used is somewhat rough, but I decided to preserve the original form given to the stories by their authors rather than try to rework them into a more polished version.

Most of the narratives were very short, running to one or two paragraphs. Because of the limited length, many of them are presented as outlines, often with additional notes concerning the story, such as its genre (western, crime, science fiction etc.) or a title. These stories are much like in folk tales, whose

> plots... are relatively uniform, in spite of an enormous invention in matters of detail and embellishment. They can delight by coming up with new variants on old themes, and new twists to old plots (Gabriel, 2000: 11).

My interest does not lie within the intricacy of the plot though, but in the narrative space that the stories manage to create. This space can be very informative in regards to the associations brought about by the computing discourse, and it will form the object of my analysis. I shall proceed in examining the narratives by first identifying some of the peculiarities of the spaces presented in the stories, and then continue analogically as I did with the magazine contents, attempting to sort out the different spaces appearing in the narratives, as well as to map out their relation to one another.

Stories

The settings of the stories varied widely, as the different images and the authors' imagination worked together to provide an extensive range of locations. Among the most popular were the outer space, cyberspace, cities, wilderness, and the sea. The first two of these locations form the standard science fiction fare; indeed, many stories are described as taking place in the future, which is another staple of science fiction. The linkage between computing and SF can be invoked explicitly in advertising images (e.g. fig 7.18; 7.25), but it is also a common feature of stories based upon quite contemporary-looking images:

> The year is 2077; the world is dominated by Asians. Thanks to biotechnology we don't eat animals anymore, we eat insects and vegetables. We just went to the corner shop and bought a can of fresh, meaty worms to make spaghetti [1, fig. 8.1][31].

Yet even though high technology settings evoke images of the future, they do not necessarily reflect dreams of progress. In fact, none of the stories described an unambiguously utopian future, and the one presented above is perhaps the most optimistic: having to eat canned worms can be perceived as a fair trade-off for protecting the lives of animals. But it still can be contrasted with a much more optimistic tale, inspired by the same image, set in a contemporary setting. In this case, the narrative tells of a disaster turned into an opportunity:

> A man went to a shop to buy some peas; after returning home he opened the can, looked inside, and there were no beans inside but such a surprise—something totally different (worms). He wanted to throw them away, but then thought: "I'll give them to my friends who can use them as fishing bait." The friends did indeed catch a lot of fish, and this inspired him to open a shop selling worms as fishing bait. He made a fortune from that [2].

[31] I identify the stories by consecutive numbers (in the order of citation) enclosed in brackets.

Ambiguity, however, does not reside solely in the future—advanced technology, such as computers, calls up fears of a possible disaster. Thus, a picture showing a white human outline ripped out in a blue background (fig. 8.2) is interpreted to depict a scene from a rather tragic retelling of a then-current story of technological failure—the numerous malfunctions and subsequent abandonment and destruction of the Russian (formerly Soviet) space station *Mir.*[32]

> This is the last astronaut of *Mir,* who decided that he would jump out of the station and got smacked into the ground, he did not even burn in the atmosphere. [3].

Malfunction is not the only way that computers can become a threat. Sometimes they are presented as inherently dangerous, and a commonly reappearing image is that of being sucked into the computer or cyberspace—such event was described in three stories, including the following one:

> We came to the conclusion that this man is an Internet maniac who cannot live without his notebook with a wireless Internet connection. The guy comes to an airport in London and gets on a plane. The plane takes off and flight goes normally, but when the crew counts the passengers after the landing in Paris, it turns out that one person is missing. In the VIP section there is just a notebook with an open Internet connection. The guy is missing... he got sucked in [4; fig. 8.3].

In this particular case, the advertisement that inspired a story of being devoured by cyberspace did not actually show anybody disappearing inside a computer (though, as fig. 7.22 shows, such images are also present), it was a trope introduced by the narrative's author. Apparently, being sucked into cyberspace is a powerful image. It is also an unwelcome one, as made explicit by another account:

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[32] *Mir* can easily be interpreted as a successful space project—the station remained in orbit for 15 years, and lasted long past its originally predicted lifespan. However, the news of its malfunctions and later destruction were commonly framed as a narrative of faulty Soviet technology. The same connotations were used in the 1998 film *Armageddon,* where a dilapidated Russian space station is obviously presented as a caricature of *Mir.*

> [W]e see a human being holding a thin line connecting him[33] to the real world, and he mustn't let go and be sucked into the computer [5; fig. 8.4].

Spaces

Wariness towards technology is also reflected in the spaces created in the stories. At the outset of this study I attempted to sort the different spaces of the narratives according to the tripartite model I arrived at by the end of the previous chapter. Quickly enough, though, I was struck with the absence of the technical space in the stories' settings. In sharp contrast with the magazine discourse, no technical data were invoked or hinted at, there was no talk of performance, no dimensions were described, and no measurements were given. The only exception seems to be time, which is quantified, and the descriptions of which often include figures in the form of dates or specified age of the protagonists; one story talks about "the seventeenth century U.S," [6] another one takes place in the year 3000 [7]. In yet another [8], the protagonist is described as "an 80 years old man."

This does not mean that the stories' authors did not perceive or construe technical space, but rather that they excised it from their stores. For the technical space is indeed alluded to and invoked (but not presented), albeit only in a negative light.

> [It] is a soul-less place, it is a dehumanized machine or database.... It is utterly ordered, nothing is left to chance. [9]
> These straight lines symbolize that everything has become easy, that all relations between humans could be described in binary code, and on the one hand it was good, but on the other hand life became boring because there were no breaking points. [10, fig. 8.5]

These narratives clearly refer to concepts characteristic of the technical space; one mentions binary code, known foremost as the basis of computing, and the other one

[33] The word meaning "a human being" carries masculine gender in Polish, and the body presented on the illustration is also male.

describes ordering and the elimination of chance[34], invoking predictability as a defining idea for such space. However, none of these stories adopt the language or the imagery used in computer magazines to represent the technical space. They do not dwell on the performance or specifications of the described machinery, nor do they attempt a dispassionate stance that distinguishes the space of the Cartesian, rational mind. In fact, these descriptions are remarkable in that they contain explicit moral valuation absent in most other narratives; technical space is soul-less, dehumanized, and plainly boring, and is thus expelled from the stories and their language.

If I remove the technical space from my consideration, I am once again left with the model I started with, that is a binary division between the corporeal space on the one hand, and the virtual on the other.

Corporeal and virtual spaces

As I have shown in the preceding chapters, this model represents very widespread assumptions about available spaces and their relationships, and it is thus justified to use it as a tool for making sense of those spaces that are presented in the stories. Indeed, it is quite easy to identify numerous instances the corporeal space appears in the narratives. Such stories concern the relation between the body and its environment, with technology often pictured as an important, or even defining, feature of the latter. The following example serves well to illustrate these motifs:

> A model comes into the studio to pose for photographs for a computer advertisement. It turns out that the whole set is not yet ready for shooting,

[34]Randomness has notoriously been difficult to implement in computing, and to this day random numbers used in sensitive applications (such as cryptography) are generated by recoursing to human input.

> and he feels very much out of place. There is nothing for him to do at the moment, so he sits down next to the various computer components which have been taken out of their boxes, but are not yet connected to each other. The cables are still missing. Now he just sits there uncomfortably, waiting for the set to be prepared and the shooting to start [11; fig. 8.6].

This story continues the display of threatening machines by pitting body against technology—the former is presented as uncomfortable and uneasy in the presence of computer equipment. Machinery is further alienated by being unused, or even unusable; it is not even plugged in, and thus forms a counterpoint to the subjective, lived-in corporeal space associated with the body.

Such separation conforms to the antropoemic strategy of dealing with otherness, as described by Claude Levi-Strauss (1963/89). It consists of "vomiting," that is excluding, separating, and generally rejecting the Other, who is presented as incurably alien and disregarded as unworthy or incapable of interaction.

The other, opposite, strategy of coping with otherness identified by Levi-Strauss is antropophagy, which involves

> "ingesting", "devouring" foreign bodies and spirits so that they may be made, through metabolism, identical with, and no more distinguishable, from the "ingesting" body (Bauman, 2001: 24).

Here the Other becomes assimilated, no longer different or recognizable as distinct or separate. This approach is also reflected in the narratives of corporeal space—in such accounts technology no longer seems threatening, but offers instead a chance of attaining perfection through melding with the human body:

> A sportsman created by scientists, into whom they implanted a chip; he is just perfect—no errors at all [12; fig. 8.4].

Quite literally, the machinery is no longer envisioned outside, but becomes a part of the new body that is neither human nor machinic, yet all the better for its hybridity. The mix is

a powerful one, it not only allows for reconciling the tension between the machine and the human body, but also helps in creating passages between different spaces. The following narrative moves from corporeal to virtual space, using the linkage between the body and the machine to convey this passage:

> Once upon a time there was a beautiful woman. She was living in New York in Manhattan in one of those skyscrapers. She was occupying 200 square meters flat. She was very rich because she inherited a computer empire after her father's death. She was also very educated, because her father wanted her to be the best. He invested a lot of money in the best university, the best college and everything and he was always telling her that she was the best and he was enhancing her self-confidence. So she has learned to love herself very much. But after some years it turned out that she was actually alone—no partner, no boyfriend, no nothing. And she came to understand that she was actually not as perfect as she thought she was. So to enhance her self-confidence, she put her photo as a computer wallpaper so that every time she leaves for work, she takes a look at the computer and sees how beautiful, how wise she is, and with thus enhanced self-confidence she is pleased [13; fig. 7.3].

The story starts with a description of the physical characteristics of the protagonist and her surroundings, then moves on to flesh out this sketch—living in Manhattan is presented as a symbol of immense riches, while beauty is explained to represent overall attractiveness (education and money as well as good looks). High technology is shown as a source of alienation—despite vast financial resources stemming from owning "a computer empire," the heroine is completely alone. But at the same time, they form a solution to the problem, and allow the protagonist to regain her confidence. This reversal happens through her virtualization and, once again, through intimate contact with technology. But even as the narrative's focus moves into the virtual space, the distinction between the spaces remains: the typology of the corporeal opposed to the virtual concerns spaces and not the narrative structure. The face on the monitor screen engages identity and self-worth, but not the heroine's body or the immense wealth; these remain rooted in the corporeal space. Both

the image and the body are described as beautiful, but the associations are different—corporeal beauty accompanies displays of opulence, while the virtual one stands alongside wisdom.

Sherry Turkle (1984) described a computer as representing a "second self," a vehicle for examining as well as constructing the user's identity. High emotional investment in computer interaction and the machine's appearance as a quasi-sentient being both contribute to its ability transforming its user's personality by serving as a medium for self-reflection. But, as Turkle herself later admits,

> information technology is doing more than providing an evocative object for our self-reflection... it is the basis for a new culture of simulation and a fundamental reconsideration of human identity (1995/6: 320).

The idea of a culture of simulation echoes Jean Baudrillard's writings on the disappearance of the real (1986/98) as well as virtual reality technologies[35]. But virtualization, both in the narrative above and in Sherry Turkle's analysis, is not the all-encompassing phenomenon envisioned by Baudrillard. Neatly separated along the Cartesian dividing line, the body remains excluded from the empowering virtual space.

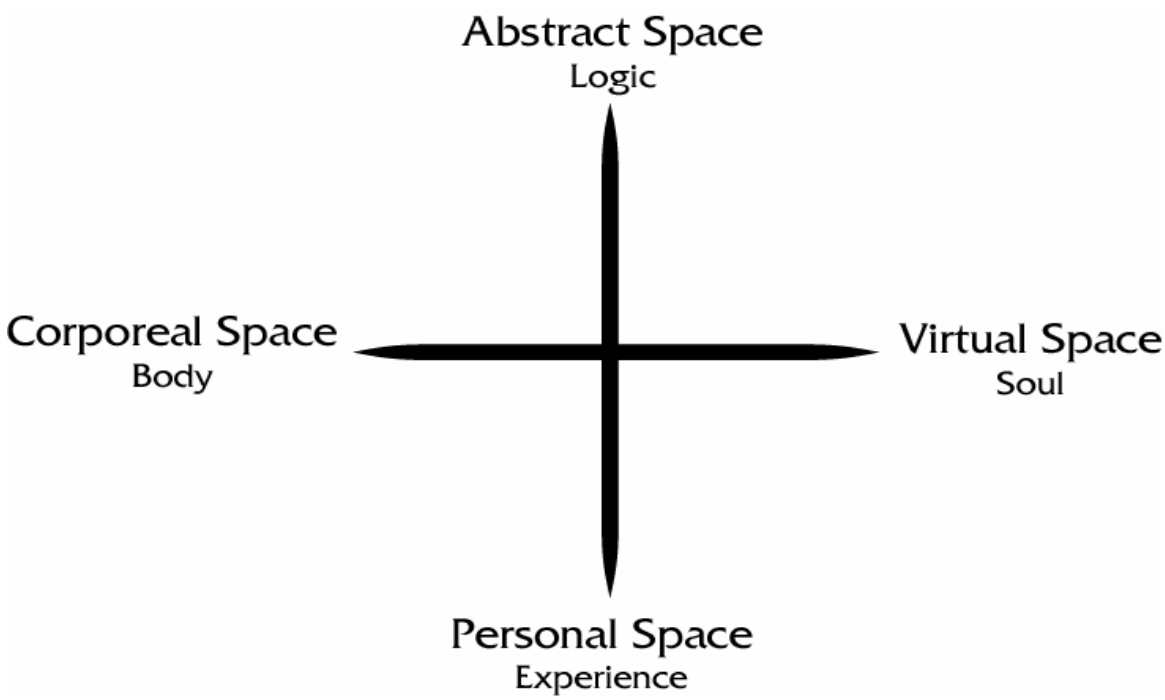
The latter encompasses not only cyberspace, but feelings and imagination as well. Thus, cyberspace does not need to be explicitly (or even implicitly) involved for the stories to be set in virtual space. What is important is the mind's separation from the body, which can never experience virtual space directly. Consequently, many stories categorized as describing virtual space feature landscapes of fantasy or dreams, what David Hess (1995: 375) calls "the low-tech version of virtual realities." In some tales, the connection between the imagined and the virtual may even be made explicit:

[35]As I have argued in the previous chapter, the two themes are often joined together.

> This is a fantasy story, or a fairy tale, set in a strange land full of magic. A group of heroes sets out on a quest to recover a lost artifact. They will have to overcome many adversaries and survive numerous adventures before reaching their goal. All of it takes place inside the computer [14; fig. 8.7].

The association is by no means unique to the students' stories. *Tron,* touted as the first feature film to combine computer animation with live actors, was produced by Disney Studios. It presented fairy-tale story set largely within digitized computer space. Roger Zelazny and Jane Lindskold's novel *Donnerjack* (1997), analyzed in chapter six, similarly conflates the virtual and the mythical.

Yet while the opposition of the corporeal versus the virtual is undeniably present in the narratives, it does not go far enough to describe the basic differences between the spaces of the stories. For the stories differ not only in the locations they describe, but also in the ways in which spaces are organized, or structured. It is possible to discern two methods of structuring space in the narratives, corresponding to what I label the personal and the abstract spaces. This distinction is independent from the corporeal/virtual dichotomy, and so I add it to my model as a second axis.



Personal space

In the personal space, the world is defined around and in relation to the central characters. Plot comes to the foreground, and the tale is structured around a meaningful chain of events. Usually, the surroundings are described only vaguely, as only the information pertinent to driving the story forward is presented.

> There was a man, who was one day searching for something in the basement of his grandmother's house, and while he was searching, he came across plans for some building. It looked like the plans were original—very old, and original. There was no inscription on it, no signature, no date, and he started wandering where the plans came from, and who was the author of these plans. And he would try to find that out, but he could not discover anything. Several years later he went to the States with his wife on what promised to be a wonderful trip; one day in a certain city he looked across the river at a certain time and he had a kind of a déjà vu feeling: he felt he knew that view from somewhere. And as he stopped and stared at this image in front of his eyes, he realized that the plan depicted part of this area. And this is how he found out what the buildings were, that they were part of this particular city [15; fig. 8.8].

In the same vein in which I took the physical space to represent the body, and the virtual one—spirit, I equate personal space with experience. After Kenneth J. Gergen (1994/7), I understand experience to mean not simply a collection of events and feelings happening to the person, but a story, structured according to narrative conventions, that arrays the disparate events into a meaningful whole. Personal space is described in the form of such a composition, presenting events and feelings of a single central protagonist; the world around becomes important only in so much as it affects the main character, as illustrated by the following tale:

> This is a story about a photographer who wants to get a big picture of the whole city. He is searching in so many places, gets on so many buildings and stuff, but he still cannot get a good picture of the whole city. So one day he sees this skyscraper and he goes on top and sees some open door. You could

> see somebody was supposed to lock that door, because it's some kind of a special room. He goes inside, and he sees this beautiful view of the whole area. At this moment he has an epiphany, takes the most beautiful picture in his life, and then he contemplates the view [16; fig. 8.9]

This narrative is even more explicit in showing the outside world as a reflection or counterpart of the protagonist's struggle to find epiphany. Practically all description concerns the quest undertaken by the photographer, its intensity and importance.

Abstract space

In contrast with the personal space, the abstract space does not much involve the story's protagonists. It is the world defined in itself, not in relation to anybody's experiences, and it does not require any characters' involvement to justify its existence. It does, on the other hand, rely on the laws that govern it—these laws are described, and made explicit as the foundation of the account:

> The story takes place in the future and this is such a box that everybody has in his or her house. It can be one box for a four-person family—the model for family is four persons in this story, everybody has his or her place, and the world for this people is enclosed in such a box, such a computer. So when they want to leave their house, because they have only such a house, and just blue rooms and nothing more, no table, no anything. And if they want to go out, to meet somebody, they get into such a box and they can be e.g. in Egypt—they plug themselves in and put on blue glasses, and then they are there [17; fig. 8.10].

This description fulfills only the most rudimentary requirements of a narrative: there is an element of temporal embedding in this account. It is not a narrative if judged by a more stringent definition (White, 1987/9; Ricoeur, 1991): it presents neither a causal chain nor even really a succession of events. While a vestigial plot, concerning a family's means of arranging a trip, can be discerned, the bulk of the account is an explanation of the life in a future house. Nevertheless, I shall continue to call these fictions stories, even though the

word is usually reserved for a class of narratives (Todorov, 1978/90; Czarniawska, 2000). I do this simply because the authors used this word to represent their work, and because they were created in response to my plea for stories.

Thus, the following story contains little in the way of temporality, being rather a snapshot of the situation and concentrating on the word space:

> It is the year 3000, and there are two planets fighting for place in space. The site of the conflict is here, and here are the spaceships from one and the other planet, and this will be the ultimate battle for place in space [7, fig 8.5].

The fiction was probably much inspired by my explanation about being interested in the issue of space, hence the repeated reference to the "place in space." Still, the introduction I offered to the students was very brief and consisted only of stating my interest in spaces related to computers—I never mentioned places or any other features appearing in the story.

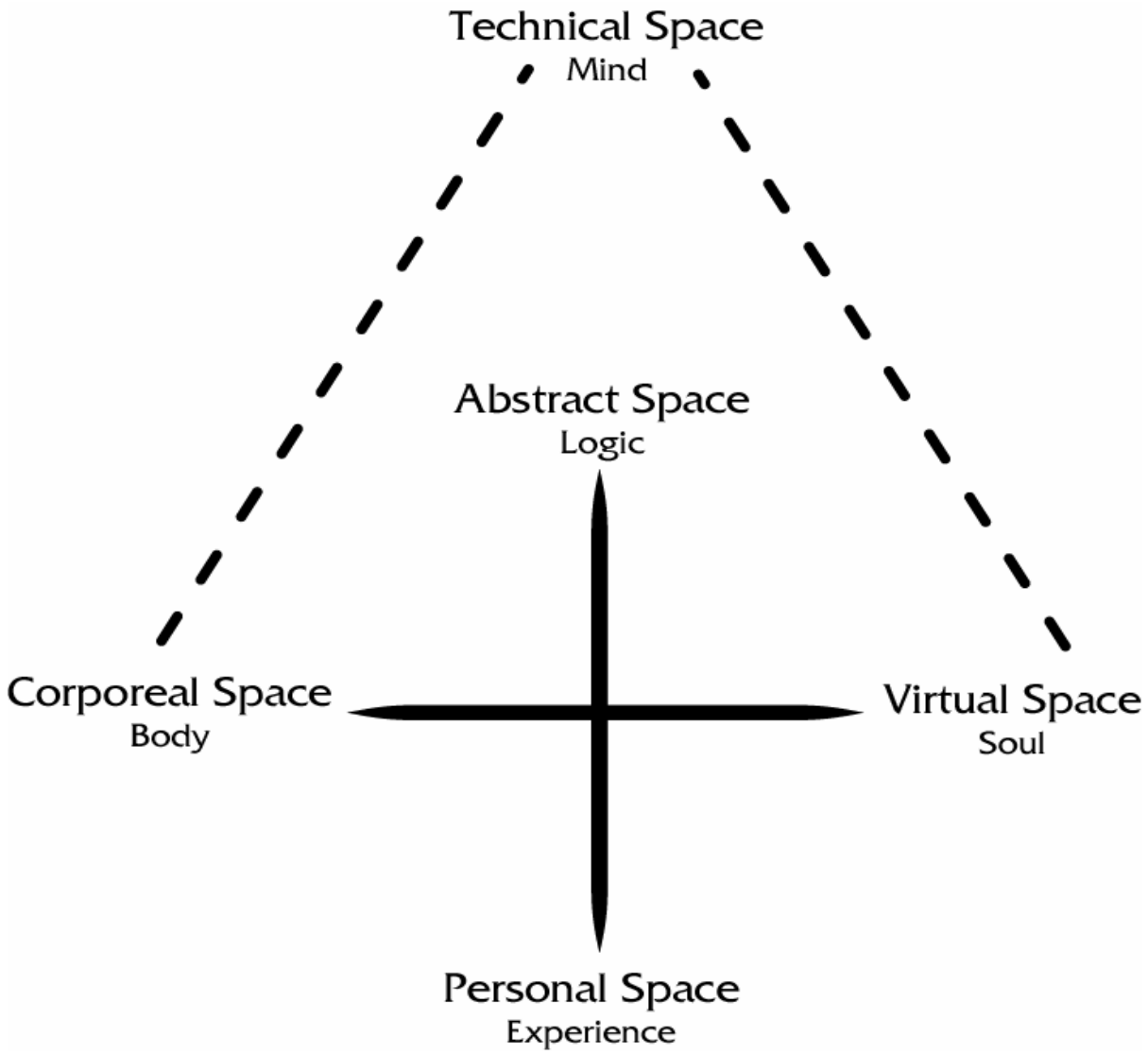
Both this and the previous story contain a vestigial plot (a trip and a battle), but are largely static (there is no succession of events), and the emphasis is on describing how the world operates.

Because of their emphasis on explicating the laws governing the world they present, I associate the stories of abstract space with logic. By logic, I do not necessarily mean formal logic, but rather any universal set of rules, in this case describing mechanisms behind the stories' world. In this regard, I follow Barbara Czarniawska, who differentiates between the logic of theory, of representation, and of practice (2001). In this case, it is not necessary to try and find out what kind of logic is used in a particular story (and there are obviously different ones in different tales)—the existence of any explicit set of laws forms the abstract space. Such space is logical because its chief characteristic is its adherence to specific rules.

At the same time, while the logic behind the stories' worlds is presented in detail, the narratives as such are very limited; [17] describes how to go on a virtual trip, but does not relate any such voyage. [7] explains the spatiopolitical situation, but not the actual war. In other words, while it is possible to discern a vestigial plot, it does not form an integral part of the story. A different (though equally limited) plot set in the same world could easily be substituted without changing the main tenets of the story. In this sense, the spaces of these narratives are devoid of experience, and thus abstract. In my model, the abstract space forms an opposite pole to the personal one described above, and thus the model consists of two axes: one covers a spectrum ranging from the corporeal to the virtual, and the other a continuum between the abstract and the personal.

There are also some similarities between the abstract space and the technical space, the latter being excised, as I argued, from the narratives. Both present a highly rulebound setting, and both tend to embrace futuristic symbolism. At the same time, there is also a crucial difference between the two. In abstract space, the laws governing the world are explicitly described, whereas in the technical space the often very similar rules are taken for granted and not explored. Consequently, the specific qualities of the technical space as described in the previous chapter are absent from the abstract space of the stories. Humans are not excluded, or separated, from the abstract tales, though they are presented through patterns of behaviour, such as a general way of travelling [17] or common eating habits [1] rather than through individual experiences.

The model



The four spaces represented in the stories: the virtual, the corporeal, the personal, and the abstract are depicted in this model in the form of two intersecting axes, much like the traditional Cartesian coordinate system. The horizontal axis can be thought to describe location represented by the space: either within or outside the physical world, in the virtual or in the corporeal realm. This axis also covers the degree of mind/body separation; the corporeal space anchors thoughts and experiences in the body, while in the virtual one the disembodied mind functions as the locus of consciousness.

The vertical axis of the diagram deals with the way in which space is organized—either according to logic and rules or to experiences and narrative sequence. This covers not only the organization of described events (in such case the word "space" would have been superfluous or forced), but the entire setting. Indeed, as I have demonstrated above, abstract space is usually presented in tales with at most a rudimentary plot, and its organization revolves around generalized relations rather than concrete events.

Presenting the model as a Cartesian graph implies that the spaces in each story can be positioned somewhere on both axes, and not just classified as one of the four kinds of space. In other words, it is possible to see combination spaces, such as virtual/abstract or corporeal/personal. I would like to examine each of these couplings, both presenting examples from the tales I have collected and providing commentary on each variant. It is, of course, impossible to provide an exhaustive review of all the possibilities—the collected stories rely as much on the creativity of their authors as on the limitations of spatial organization schemes. Instead, I attempt to point out some of the more interesting characteristics of the combined spaces, and the way these characteristics are evident in the narratives representing these spaces.

Corporeal/personal space

Of the four combinations, perhaps the one most conducive to telling traditional narratives is the mixture of corporeal and personal elements. Stories set in such a space tend to follow narrative structure,[36]and the focus on the immediate physical surroundings encourages realist descriptions. Of course, the plot itself may be highly fanciful, as the following tale well illustrates:

[36]David Carr (1986/91) and Jerome Bruner (1996) go as far as to maintain that a narrative is a natural form of all human experience, thus making space based on experience inherently narrative.

> We imagined some kind of a fantasy story. There was a guy, who on Saturday was going to visit his friend's house, and there was some kind of party there, with masks and disguise. But he didn't have any clothes, any gadgets. So he borrowed a brush from his grandma, and glasses from his girlfriend, and suddenly he saw an UFO, and they lent him lipstick made from stardust. And then he could go [18, fig 7.10].

The story describes itself as fantasy, and the appearance of an UFO and stardust lipstick justifies the claim. But the protagonist's motivation is much more mundane, even as it mirrors the worries of Cinderella—lack of proper attire for a masked ball. The corporeal aspect is underlined centrality of the hero's body, successively adorned in consecutive encounters. But although corporeal space always situates space in relation to the protagonists' bodies, the bodies need not necessarily be human:

Obviously this is a picture of a beautiful girl, because this printer is a she. So the story goes like this:

> It was an ordinary day when Hewlett woke up from suspend-mode; an ordinary Wednesday, you could say Wednesday bloody Wednesday—one had two days of hard work already and the weekend is still so far away. As usual, Hewlett started to warm up, waiting for John to change his cartridge. He felt empty, dirty, and he knew he needed maintenance. But suddenly something interrupted Hewlett in the process of drowning in sorrow. He noticed someone new in the room—gosh, she was beautiful, shiny gray, lots of drawers and a paper-feed container. She didn't have any make up on, but an LCD panel looked really pretty on her. She was still in deep sleep, unpowered, so he couldn't even ask for her name. But he knew his life was about to change. He knew it was love. Later he found out that her name was Uficio850 [19; fig, 8.11].

The main twist of this story is obviously the casting of machines as main characters. It follows the tradition of fairy tales, where inanimate objects are often given powers normally restricted to humans and/or animals (sentience, speech, mobility), but it can also be interpreted in the broader context of attributing agency to nonhuman agents, as

discussed by Keith Grint and Steve Woolgar (1997) or Bruno Latour (1999b). Furthermore, this story recalls the issue of eroticization of computer equipment, as examined in the previous chapter.

Virtual/personal space

The virtual space, on the other hand, involves landscapes of the mind rather than of the body. When coupled with experience, this often translates into narratives of daydreaming or imagination:

> A guy walks over some hills, rifts and chasms and he is afraid of falling in them because there is water down there and he can't swim at all. Suddenly he trips and starts falling and then, when he thinks he fell in water it turns out that it was paper or some colour fabric and he imagined it all [20; fig. 8.2].

Here the differences between the corporeal and the virtual are not very pronounced. It is not even clear how encompassing is the final revelation—did the whole trip take place in imagination, or was only the water imagined? Nevertheless, this tale places much more emphasis on the thought processes of the protagonist. This is foremost a narrative of fears and delusions, and only secondarily an account of a hike through the hills, hence its placement in the virtual space. While this story is a borderline case, the following one, although very similar on the surface, is much more firmly located in the virtual realm:[37]

> An 80 year old man who dreamt about flying and skiing. He had a computer and he couldn't walk, so he spent all day in front of a computer. And one day he discovered he was both flying and skiing. And he combined the two—he was doing both at the same time, But it wasn't so easy, he didn't know how to do it. So he realized that somebody was manipulating him. He discovered that he was just a computer mouse. And then he woke up and it was all a bad dream—he had fallen asleep in front of his computer [8; fig. 7.19].

[37]A simple quadripartite model cannot hope to relay all the nuances of interactions between various spaces. A true Cartesian graph would allow much more precise positioning, but arbitrariness involved in quantifying cultural and linguistic constructs renders such an endeavour rather pointless.

Once again, the narrative takes place in the protagonist's imagination, and physical actions are reduced to mere flights of fancy—the hero's inability to walk in the physical world reflects the primacy of mind over body. This hierarchy, inherent to the virtual space, is further emphasized by the malleability of the protagonist's (imagined) body. Not only, at the age of 80, is it made to fly and ski at the same time, but it can also turn into a computer mouse. In the stories of corporeal space, different bodies, including mechanical ones, could be represented, but fluid shifts between one form and another are limited to virtual worlds.

The tale is structured according to the logic of a dream—events and realizations follow one another by association rather than causal chains. Yet it is an account of the protagonist's experiences, not an explication of dream logic and so, unlike the stories below, it is set within the personal space.

Corporeal/abstract space

Abstract space relies on explicating the rules governing the described world. When coupled with corporeal space, this means positioning the body within the setting, and explaining the rules responsible for its predicament.

> First impression: human body, although marvellous, can break down, but the computers are perfect and will never break down. Second impression: people should not become addicted to computers, and on the picture we see a human being holding a thin line connecting him to the real world, and he mustn't let go and be sucked into the computer [5; fig. 8.4].

As usual in the tales set in the abstract space, the plot is practically nonexistent (though two successive impressions suggest the passage of time). What is present, though, is a set of rules—a comparison between the human and the computerized body, as well as a prescription dealing with the familiar theme of getting sucked into and lost in a computer. The tale is interesting in that it creates a tension between its two observations: on the one

hand, computers are superior, on the other, they can be hostile and dangerous. Also, the computers are presented as physical beings, competing (and winning) with the human body and not, as is usual, with the human mind.

> This is the final, contemporary phase of handing down family traditions. It began in the antiquity—when the firstborn began to walk, the father built an arch of triumph. And the task is much easier nowadays, for when the child learns to walk, the father takes building blocks and they build together [21; fig. 8.12].

This story, while not tied as closely to describing bodies as the previous one, nevertheless addresses physicality and its rules. It spells out the rules of raising the firstborn child, in the form of prescribed physical activities. In a mirror to virtual narratives, thoughts and mental states are not mentioned here at all.

Virtual/abstract space

When there is no easily defined protagonist, and abstract space usually prevents individualization necessary to create one, it becomes impossible to set a tale within the said protagonist's imagination, as is the common device in the tales of virtual/personal space. Instead, in virtual/abstract setting the description shifts to the level of whole population, describing its belief systems and customs.

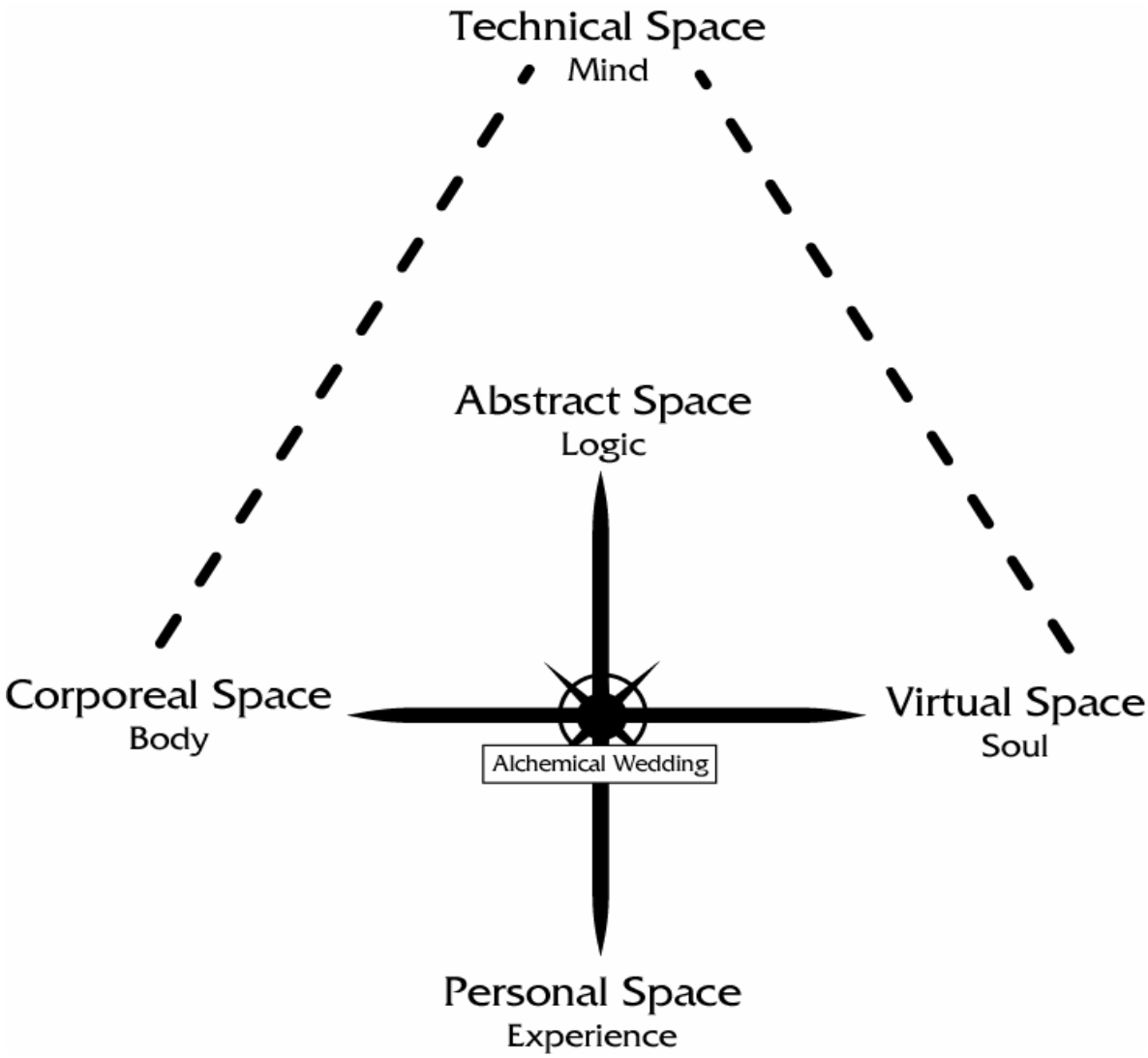
> The book is a fantasy adventure kind of book about an underwater world—a whole different civilization. This is the way they see the world—as a cube; they don't actually know how it is, this is just how they imagine it and they spend all their lives underwater. We don't have a plot [22; fig. 8.10].

The lack of a plot is clearly admitted here by the authors—an obvious indication that the story is set within the abstract space. And indeed, it presents its genre information, and proceeds to describe its setting, or rather the cosmology of the people that inhabit it. The focus on the mind, and thus the virtual space, is reinforced by stating that the beliefs are erroneous, without explaining what the world is truly like.

> My association was with the skymap of the future, when the progress of computerization went so far, that there was universal happiness and people were very grateful to the creators of the first computer programs, the distinguished ones, and they started to replace names of the stars with the names of computer programs and particularly distinguished companies. These straight lines symbolize that everything has become easy, that all relations between humans could be described in binary code, and on the one hand it was good, but on the other hand life became boring because there were no breaking points [10; fig. 8.5].

The above tale similarly concentrates on the ideas underpinning the world it describes. The bulk of the story presents changed social relations in the future, concentrated in a symbol that is the skymap. Once again, there is no plot and no individual protagonist, and the emphasis is on describing the culture rather than the physical environment.

The meeting of spaces



In the usual Cartesian graph the point in the middle, the intersection of the two lines represents a zero on all scales, the ultimately bland point, one devoid of all qualities. Yet none of the stories that I have collected, minimalist as some of them are, comes close to forsaking every one of the spaces examined in this chapter. This is because the lines on the diagram do not represent growing (or waning) intensity, but rather interrelation between the spaces presented as opposites. The point in the middle shows, then, the meeting of the four spaces in one discourse—much as in the alchemical wedding, the union of opposing forces (or opposing spaces) leads to a transformation rather than negation (Jung, 1946/97).

Silvia Gherardi, in her study of gender in organizations, uses the same symbol to denote the complexity of the interplay between the male and the female archetype:

> Sameness and diversity, unity and multiplicity, are tensions of thought and language inscribed in the symbol of the wedding, just as body and tomb, body and spirit are united in the matrimony which is the union of matter and spirit (1995: 68).

In the same vein, the different spaces do not merge as a uniform space, but can still work together to produce a fuller, if not complete, account of the experience of computerized spaces. One story in particular among those I have collected seemed to unite the variety of themes and spaces running through the various tales, and I would like to present it here as well as discuss some of its complexity:

> It's a western story. A story about the 17th century in the U.S. There were not many white men, but many printers walking on the prairie. There was a legend about a new kind of printer that could be found only by an honest man, and it's a story about such a guy who searched for those printers, he has to fight Indians, he has to help others, and finally he finds not only a printer, but also love, and that's the end of the story [6; fig. 7.15].

This is a very condensed narrative, and I would like to unpack it to show the interlocking elements from all the spaces, expanding on the storyline that is only signalled in this summary.

It presents an abstract space in as much as it is very conscious about the setting it creates—it locates itself as a western story, and follows the established structure of the genre, embellishing it somewhat with the motif of a heroic quest. It operates in the virtual realm of imagination, invoking mythic tropes of legend and myth. Not only is the story structured as a mythical narrative, but it also references a legend as a guiding principle within the story.

The reader can rely upon logic to plot out the composition of the narrative, but needs imagination to encompass its broad setting. But to position the story at the juncture of abstract and the virtual would be to miss its more viscerally engaging qualities. The tale follows an action-packed plot of a heroic quest, and one can only expect it to present the symbolic meaning of such a quest as well—the protagonist's journey should represent his spiritual transformation; Joseph Campbell's musings (1949/72) can serve as a guide to the genre's structure. The narrative can thus be refigured as a personal space representing the protagonist's experiences. And in its incarnation as a full-fledged adventure story, it can be interpreted as strongly anchored in the corporeal space—mobilizing the senses to partake in the hero's wild (and strongly physical) exploits. Finally, the tale once again recalls machines as an object of desire, or rather of full fledged romantic love.

This eclectic narrative recalls a much more famous story: the *Star Wars* (1977) film and its four sequels (with one more already in production). The movie follows an equally diverse mix of genres or conventions: science fiction, fantasy, western, samurai film, and numerous others (Gordon, 1978), but at the same time does not embrace any of them fully enough to warrant undisputed classification—while most critics would agree that it fits the science fiction tag most easily (e.g. Lev, 1998; King and Krzywinska, 2000), some, like the prominent science fiction writer Isaac Asimov (1978/81), vehemently disagree: he argues that scientific realities are ignored and trampled far too often in that narrative, and that it should be called space fantasy instead. Philip K. Dick, coming from the less technologically-driven and more visionary understanding of the genre, uses the term space adventure to describe narratives set in the future but "*lack[ing] the distinct new idea* that is the essential ingredient" of science fiction (1981/7: xiii). Although, as I have argued, the differentiation of the various genres of the fantastic is largely a matter of personal taste, the case of *Star Wars* is particularly ambiguous because of the multitude of tropes the film employs. Thus, Lane Roth (1985) alternately describes the *Star Wars* series as a mixture of different genres

(science fiction and western in particular) and as a film responsible for the resurgence of pure genre cinema.

But their genre eclecticism is not the only reason I mention these movies in relation to the meeting point of different computerized spaces. *Star Wars* films are also reminiscent of the stories presented above through their bringing together of myths and technology, as well as through making futuristic technology an integral (and well-integrated) part of the setting. An example

> would be the distinctive realized look, sound, and behavior of the two droids, R2D2 and C3Pio *[sic!]*. These two robots are original, detailed, and consistent; they may well be the most interesting characters in the film. The created world in *Star Wars* is both packed with audiovisual information and given an imperfect, lived-in quality (Lev, 1998: 31).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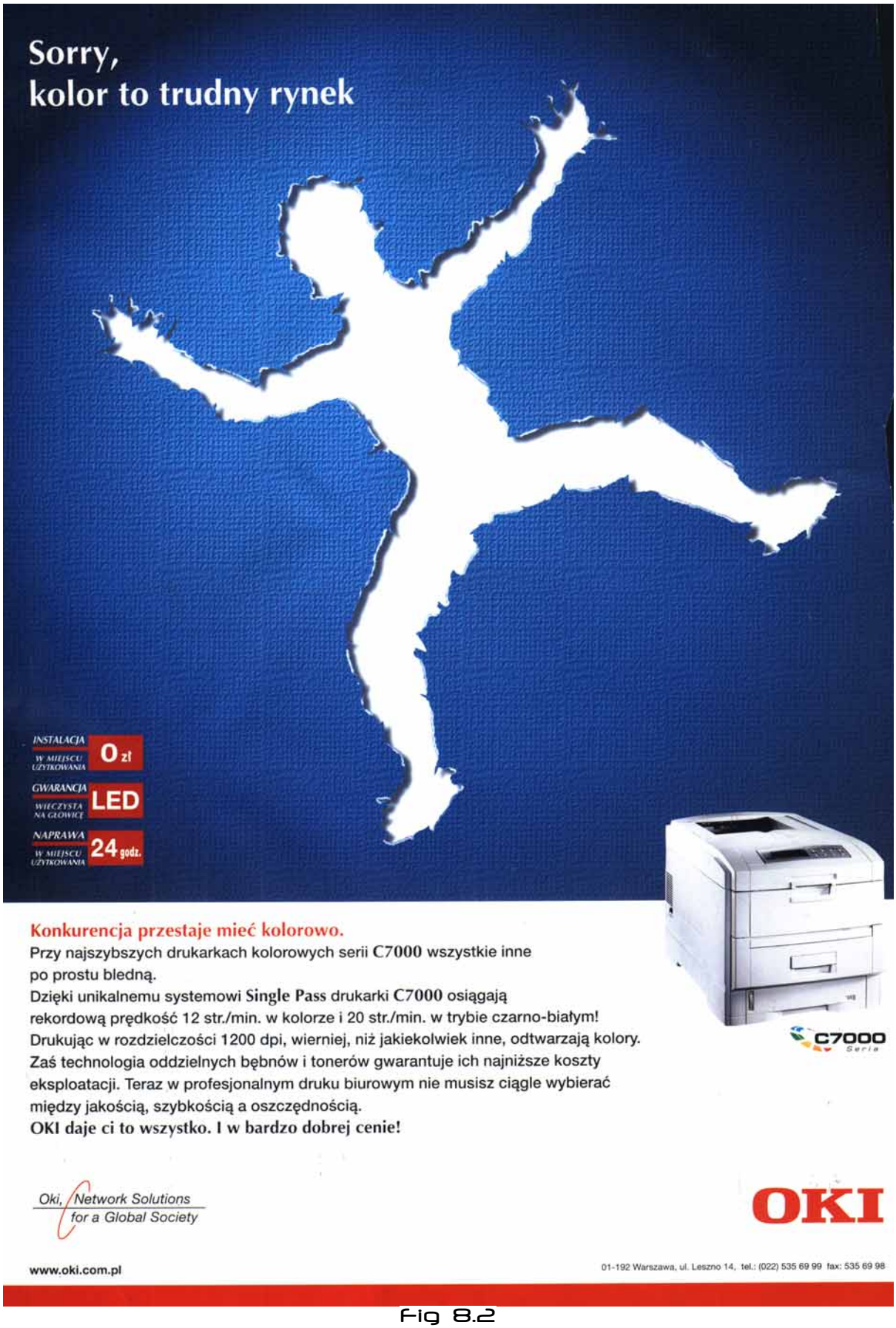
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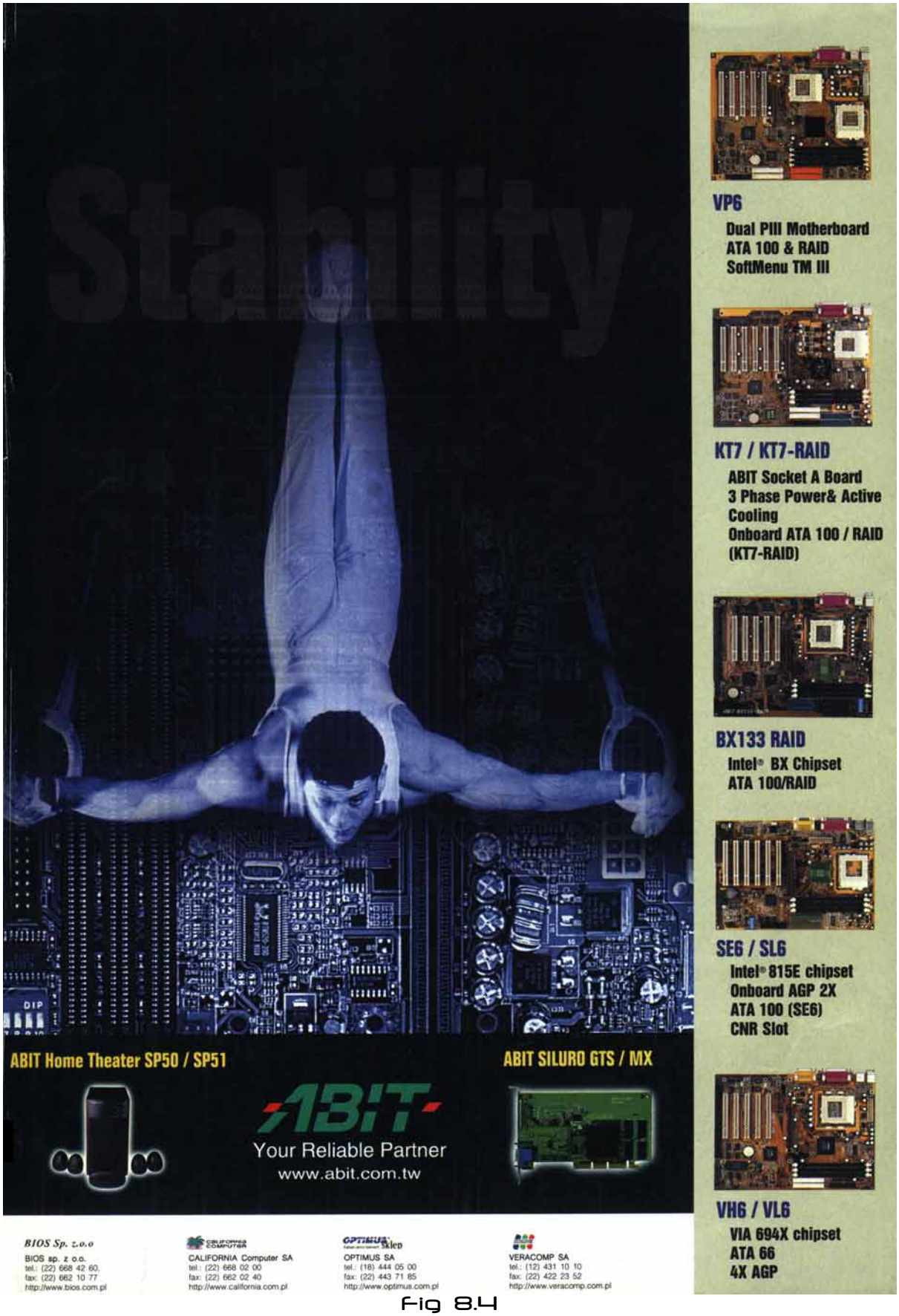
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Fig 8.4

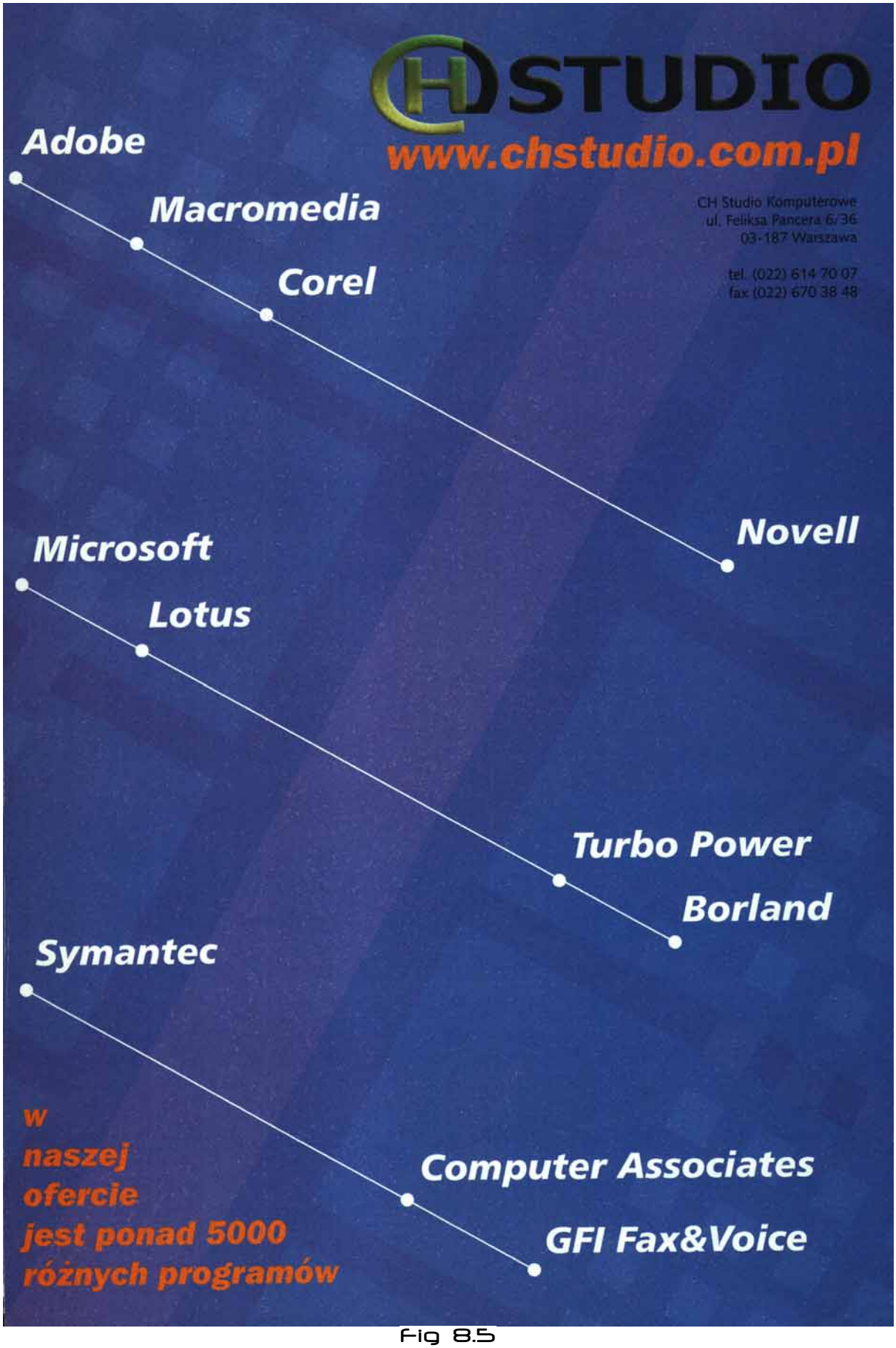
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Fig 8.5


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Fig 8.7

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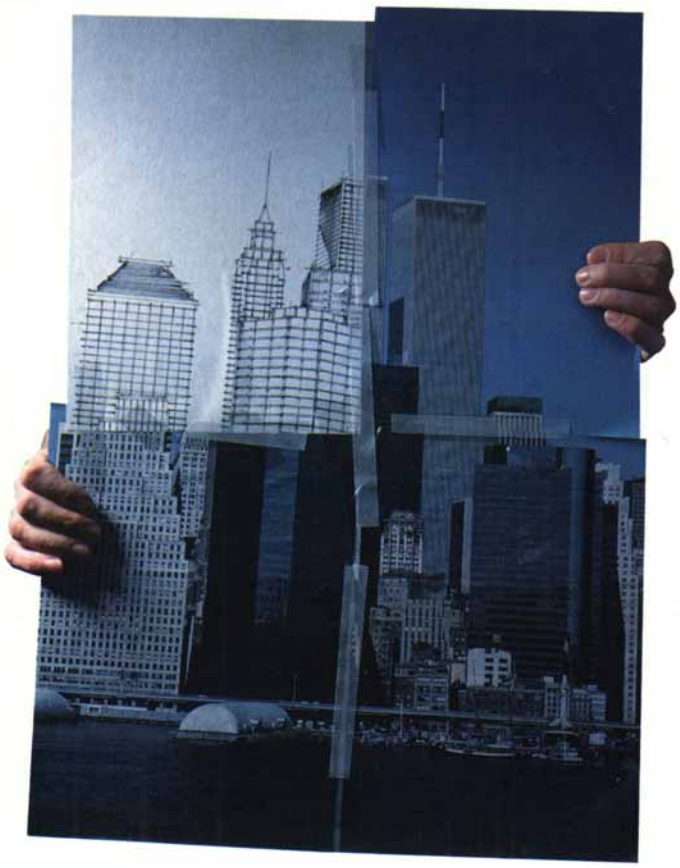

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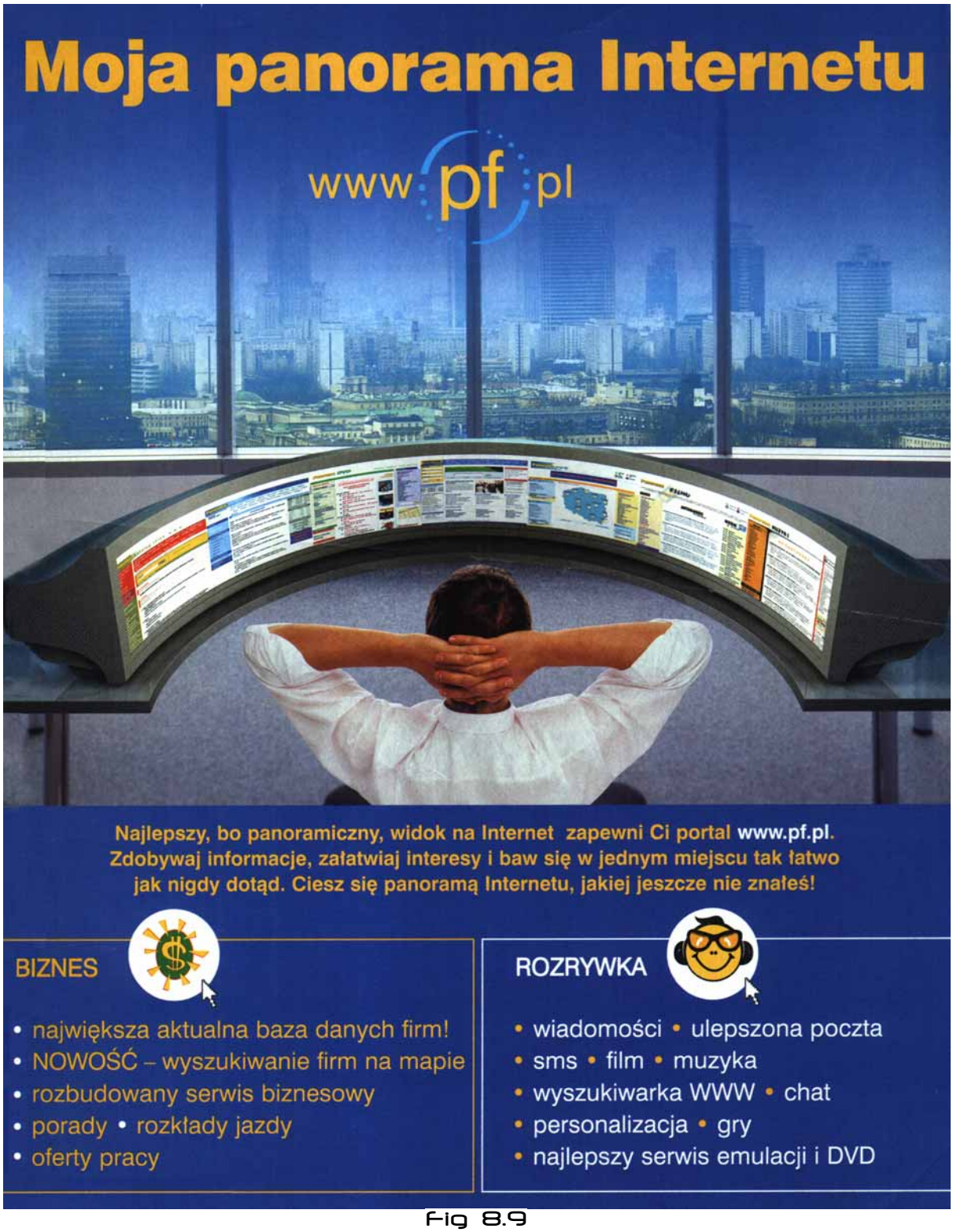
COMPUTER 2000

Fig 8.8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• sms • film • muzyka
• wyszukiwarka WWW • chat
• personalizacja • gry
• najlepszy serwis emulacji i DVD

Fig 8.9

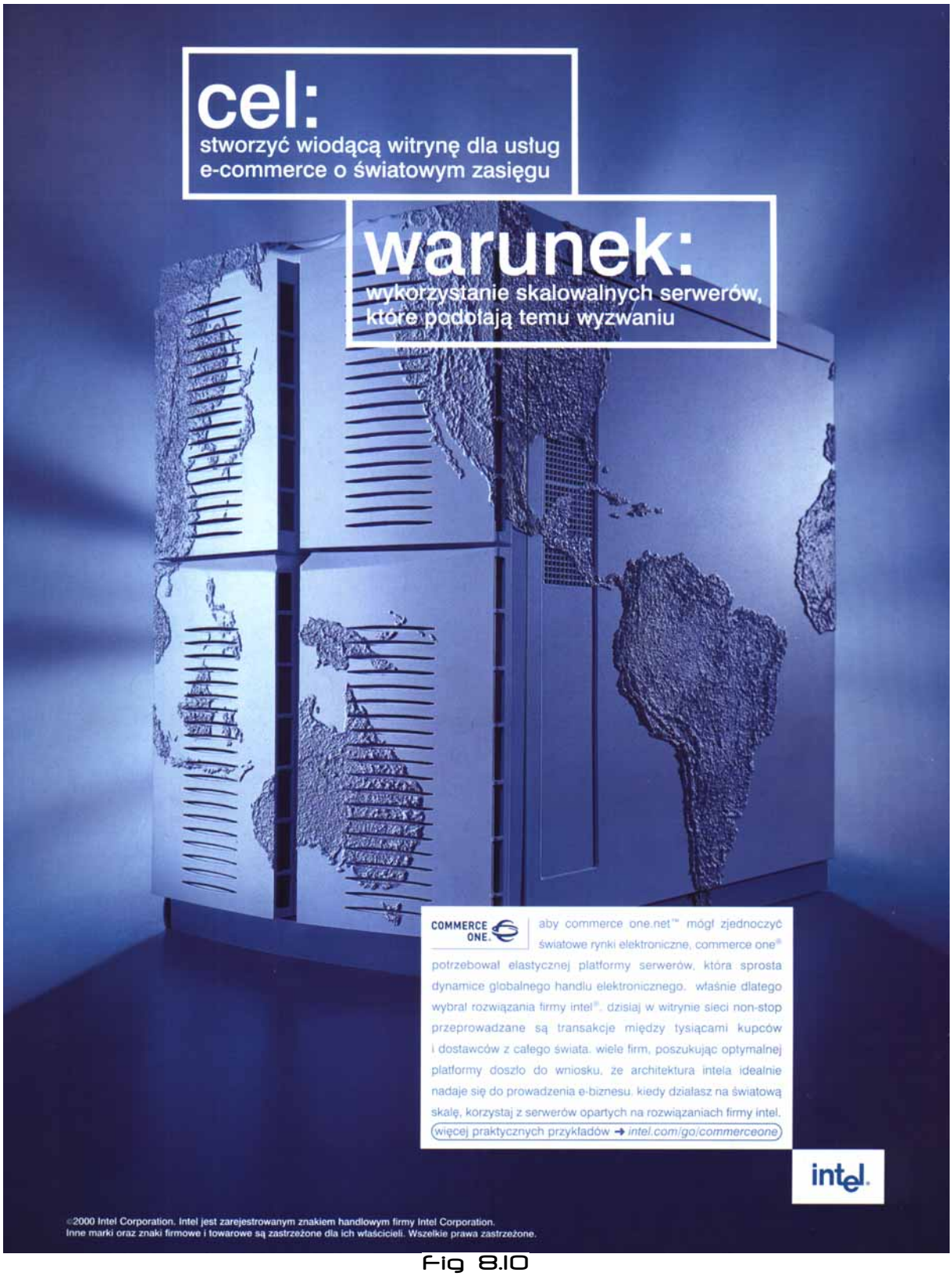
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Fig 8.10

Cyfrowa rewolucja

Drukowanie od 6 do 1190 stron na minutę

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Fig 8.11

Fig 8.12

Chapter 9: Programmers in Space

I have by now examined the discourse of computing using two techniques—text analysis and story collection. Each approach concentrated on a different aspect of the construction of space, and consequently the images of space presented in the previous two chapters differ significantly. Yet both analyses draw upon a common conceptual frame, based upon the supposed opposition of the corporeal and the virtual. This is not to say I believe such a dichotomy to accurately reflect the spaces constructed in computerized environments. Rather, as both of these analyses show, I was searching for more nuanced models that can capture the complexity of a meeting between human bodies and computer networks, opening up the initial dichotomy to show the intricate interplay between various spaces, apparently more numerous than just two.

But in turning towards interviews and observation in this chapter, I was forced to make a more drastic departure from the bipolar model, as the actors studied almost unanimously rejected the concept of cyberspace as descriptive of (parts of) their environment. Such rejection does not, of course, necessarily invalidate the idea's usability, but it undermines the value of using it as a starting point for an analysis.

Study synopsis

The research presented here consisted of eleven open, unstructured interviews with various IT specialists, complemented by a direct, non-participant observation in a company producing custom database systems, mostly for the corporate market. Nine of the interviewees were male, which echoes the fact that the IT industry in Poland, like elsewhere in the world, is largely male-dominated. In the following discussion, I rely on direct interview quotes to support my argument, believing that by letting my interlocutors

speak for themselves (albeit obviously within the frame of my own argument) I can do their views more justice than if I settled on just summarizing the material.

Eight of my interlocutors worked in DataBear[38], the company where I conducted my observation, though only three of these appeared in the branch office I studied during my stay there. My initial idea was to shadow, that is follow and observe throughout the work-day (Czarniawska, 1998; Kostera, 2003) a single programmer, but the stationary and communal nature of the work provided me with the opportunity to almost continuously observe a room occupied by three to five people. Additionally, although I expressed my interest in everything going on in the area, my initial definition as a "person observing Andrzej" made it easier for other people present to ignore me and engage unself-consciously in their everyday activities.

The choice of studying this company and interviewing particular people was influenced by both the ease of access and my prior knowledge about its working. I did not attempt to provide a representative sample, nor to present viewpoints and practices that are necessarily representative of the IT industry (or even the IT industry in Poland), for my aim is to highlight the variety of ways in which space is constructed in computerized environments, rather than to catalogue the spaces most commonly found in such settings (or the most common ways of constructing them). With this in mind, I attempted to find people who could provide me with interesting insights on the subject. DataBear was also regarded by its employees as a non-representative IT company:

> [Bogdan]: The company is very untypical, and the work is untypical as well. And you came to an untypical person.

[38]The names of the company and the interviewees have been changed to preserve anonymity. Of the actors (named alphabetically in the order of appearance in the text) mentioned, Celina and Helena are female and the rest are male.

While the above quote might not necessarily reflect my own opinion regarding the company's (or my interviewee's) uniqueness, it underscores an important, or perhaps even overarching, cultural norm operating in that organization: originality was held up as a virtue, and conformity and sameness were frowned upon. The director of the company, in a much acclaimed move, symbolically chose an office for himself in the cellar of the building serving as company headquarters, in a room converted from a bathroom. The whole building, originally a residential structure, was celebrated as markedly different from the usual office space.

> [JK]: What do you like about this building?
> [Celina]: That it is so much like home and not company-like, that it is cosy, that there is a kitchen here, where one can eat and talk, relax. That it is quiet, that there is a nice view from the windows, that there is no security, no IDs, none of the usual office regimen.

My observation did not take place in that building, but at a branch office located in a space provided by the DataBear's major customer—a telecom corporation. Projects commissioned by that client required close cooperation between project leaders and the client's representatives, and involved sensitive data that the telecom company was unwilling to distribute outside its premises. The long term relationship between DataBear and this customer also contributed to the feasibility of setting up a semi-permanent branch office on location.

Some people alternated between working in both DataBear's locations, but Andrzej, the person I initially set out to shadow, worked exclusively at the branch office. The latter was located within a larger office complex, housing not only the telecom company, but also a number of unrelated enterprises. A formal style of dress was prevalent in the building, whereas DataBear employees tended to wear much more casual clothes. Similarly, cluttered and disorderly spaces of DataBear's rooms stood in contrast to the clean and restrained decor of the corporate offices.

Uselessness of cyberspace

In both studies presented in the previous chapter, that of magazine discourse and computer-related stories, I worked on building and refining a model enumerating different spaces constructed in computerized environments as well as the relationships between them. To do so, I used the nebulous, yet potent concept of cyberspace as a starting point of discussing computerized spaces. In the interviews with IT specialists, I similarly asked about their ideas on cyberspace. Here, however, I was surprised by an almost universal rebuttal—most of the interviewees considered the idea of cyberspace rather useless in regards to their ordering of space around computers.

> [JK]: Does the word cyberspace mean anything to you?
> [Dariusz]: Aaahh, no. It is just an advertising slogan.
> [Celina]: It is a word that nobody around here uses. I have met it, but it would be difficult for me to define it.

The impossibility of unambiguously defining the concept was a common complaint and, as I have already demonstrated, one well grounded in the literature on the subject; Rob Kitchin (1998) provides three different definitions (or domains, as he calls them) of cyberspace, while Robert Markley (1994) comes up with five. That does not mean, however, that it is necessary to share the exasperation of my interviewees at the vagueness and lack of a clear definition. Some researchers, for example George Steiner (1975/92) or Heather Höpfl (1995), revel in ambiguity as a source of inspiration and creativity. My interlocutors, however, saw haziness as an obstacle to communication:

> [Emil]: I do not use this kind of a word, so it is even difficult for me to decide what it means. I don't know what exactly it is supposed to represent, so I generally avoid it—it could lead to some misunderstanding. I tell somebody something, and that somebody thinks I said something entirely different.

Disdain did not end with miscommunication. Vagueness is a problem regardless of its source, and talking is seen as a waste of time (though sometimes regrettably necessary), and an activity much inferior to the real work, that is programming:

> [JK]: What does your work day look like?
> [Dariusz]: There is a lot of prattling, much of which is smalltalk that does not lead anywhere. There is some prattling that leads somewhere, a little programming and writing some documents. That's about it.

That does not mean that the programmers' work does not have a strong social component—in fact, discussing tasks, problems, and solutions takes up much of the working time. Even Emil, a self-employed programmer who works mostly on his own, explained that a significant part of his job consists of talking (through the Internet) to people from across the world engaged in similar tasks, helping each other and exchanging already programmed solutions to common problems. Nevertheless, it is the solitary coding that is seen as the definitive expression of the programmer's profession. I shall return to the tension between group discussions and working alone at the computer. Here I would like to point out the stated preference for engaging with computer code rather than with people. Quite a few of DataBear employees reacted enthusiastically to an article in *Wired* describing IT specialists as particularly prone to the Asperger's Syndrome, explained as "scaled-down autism" (Silberman, 2001). The programmers enjoyed an image of themselves as very bright and socially maladjusted, proposed by the magazine.

Their stance echoes that of photocopier technicians described in Julian Orr's ethnography. They, too, saw themselves as focusing entirely on the machines they serviced, rather than on any of the social relations they participated in. Nevertheless, Orr saw the technicians as operating within a social network binding them, the machines, and the customers. Servicing photocopiers is the main duty, but it is largely dependent on the relationship with other technicians as well as customers, whose treatment of the machines makes the crucial difference to how easy it is to service them. Although "[t]he machines are

technicians' *raison d'être* and preoccupation, as well as occupation and sometimes passion" (Orr, 1996: 89),

> they are far from being the sole focus of the technicians' work. In fact, the technicians worry more about the social damage another technician can do in their territory than about what might happen to the machine, perhaps because the machine would be easier to repair than the delicate social equilibrium (ibid.: 63).

IT specialists' view of the computers (and computer programs) as largely transparent and easily fixed is similarly opposed by the opinion that the customers do not understand their own needs nor the potential and limits of computer database system. The customers' unwillingness to heed the superior knowledge of DataBear representatives is a source of much frustration.

> [Bogdan]: ... most often, the problems arise from the customer's stupidity. That is, the customer does not know what he[39] wants, or he doesn't have the slightest idea how to order a number of projects he has for them to work and so he requests obvious idiocies from us.... No, really, 99% of problems is the customer who is either meddles too much or does not let us improve his organizational structure.

DataBear's vast technical expertise offers a grasp of the whole of the customer's situation, and other arrangements, particularly social ones, should be subservient to technical considerations. But not only the customers might fail to see that, they might also be confused by the presence of competing computer firms. These are said to be capable of deliberately deceiving the customer, further confusing the latter's already limited judgement.

Computers, in contrast, are largely predictable, and none of the actors involved challenged the supremacy of technical expertise in dealing with computers, or the IT specialists' claim

[39]The word "customer" carries a masculine gender in Polish.

to higher knowledge in that area. Thus interaction with computers is framed as a difficult, but ultimately feasible exercise in control:

> [Dariusz]But I actually like that
> [JK]: What?
> [Dariusz]: The computer
> [JK]: Why?
> [Dariusz]: It's the same way as with people who like puzzles. You have to force it towards a certain effect, and that's it.

It does not mean that the programmers can always determine what a given computer is doing. In one conversation, a number of people admitted to not using Microsoft Outlook because of their fears that it was invading their privacy by sending their confidential data to Microsoft. In another one, the programmers deemed a piece of code "magical" as not even its alleged author could figure out what it was doing.

But having control is a strong argument, and Filip, one of the few favourably disposed towards the concept of cyberspace, acknowledges the term's lamentable vagueness, but praises the degree of control it is possible to achieve there:

> [JK]: What is the difference between cyberspace and physical space[40]?
> [Filip]: We have full control over cyberspace.

This praise of the virtual was not prompted by the doubts expressed by my other interviewees, but it is still worth noting that it only indirectly engages those doubts. Imprecise definition implies lack of control over the signifier's usage, and not lack of control over the possible signified. Such reading is reinforced by the interviewees pointing out the categories of people who actually use the term.

> [JK]: What is cyberspace?
> [Grzegorz]: I really don't know, I think it is a term invented by journalists, media, or something like that. Because it appears mostly in books and some

[40]I did not use the term "corporeal space" in order to avoid introducing confusing jargon.

> such purely fantastic space, because there is no such real cyberspace anywhere and that's that. I don't know, perhaps sending mail in some films or something like that, or on the Internet, but this is largely an extension of the phone.... It doesn't go far beyond mobile phones, really.
> [Helena]: I don't have the slightest idea [*laughs*]. I really don't know, the only thing that comes to my mind is reading Lem[41]. Only this. That's it, so I send you to Lem—apart from that, pfft.

Journalists, science fiction writers, and moviemakers all have in common their dilettantism as far as technical knowledge is concerned. In fact, William Gibson, often credited as the inventor of the word "cyberspace" admitted to knowing next to nothing of computers when he wrote *Neuromancer,* the novel in which he used the term for the first time. Dariusz expanded on the theme of journalists' ignorance by recounting a nonsensical news story proclaiming Gliwice (a city in south-western Poland) an ideal site for IT investments because information superhighways cross there.

Regardless of the scorn heaped upon the idea of cyberspace, of all the interviewees only Andrzej and Grzegorz excluded their own work from their proposed definitions of the concept; Grzegorz also had doubts as to the boundary between actual cyberspace and a souped-up phone network. Andrzej saw cyberspace as equivalent to virtual reality, and located its usefulness in the future:

> [Andrzej]: As far as I'm concerned the difference [between cyberspace and physical space] is that cyberspace is not yet ideal for replacing physical space.

The rest of my interlocutors either pleaded ignorance of any meaningful definition, or agreed that the term could be used for describing parts of their work environment, but that they did not find it in any way helpful for making sense of their experiences. Hubert, although providing an enthusiastic and lengthy definition, points out that it is suitable for the user, not for the specialist like himself:

---

[41]Stanisław Lem, famous Polish science fiction writer, author of *The Cyberiad* (1972/91).

> [Grzegorz]: You know, I associate cyberspace with the Internet. And what is Internet? It can be defined variously, but looking from the perspective of the user, not the specialist, one who is not interested in any technical details, nets, protocols, etc. etc., then it is something like an ocean. This is an analogy I can see or which I have heard, that long time ago people ventured on ships over the oceans to discover new lands or some other new things. This is similarly such an ocean over which you sail. The metaphors are similar—you sail, sometimes knowing what you seek, sometimes as if in the dark.

Irrelevance of physical space

Some of my interlocutors didn't stop at dismissing usefulness of the concept of cyberspace for describing their experiences, but proceeded to question the significance of physical space in their daily work as well. While cyberspace was vaguely defined and flimsy, physical space was banal and unimportant for the creative and highly technical task of programming. It was simply not a factor in these people's account of their work:

> [JK]: What did you like or dislike in the different rooms, locales, or places where you used computers?
> [Ignacy]: No. This is not particularly important.
> [JK]: It is not?
> [Ignacy]: No, it is important only to set up the monitors in a way that does not tire your eyes. The rest is not so significant. It is bad if there is a huge echo and at the same time silence, such as in the church. Such church-like interiors are unpleasant, for it is difficult to concentrate there. But then again, most people cope by putting headphones on and listening to music.

Physical environment is not particularly worthy of attention. The most significant issue, that of eyestrain, was introduced only after I expressed my surprise at the initial answer (the original denial of physical space's importance was delivered forcefully, and did not grammatically answer my question). The other consideration—that of the echo—is added as an afterthought, and quickly dismissed because there are ways of dealing with it. But it is interesting, for the proposed solution of using headphones involves remoulding of corporeal space (though perhaps not of physical space) to construct pleasant working

conditions. I shall return to the use of sound later on, but I would first like to examine the other objections my interlocutors had against the relevance of space (physical or otherwise) in computer-related work.

Invisibility of computers

An interesting issue has been raised by Emil. His claim is that computer's presence has no effect on his attitude towards physical space, and that my questions concern his work habits in general, rather than those in a computerized environment.

> [Emil]: I don't see it [preferred physical space arrangements] as somehow connected to the computer itself, for the computer is foremost a tool for work. I sit some, often over ten hours next to it, 80% of which is normal work. I'm doing things and I like to work when there is peace and quiet. This is why I like it if nobody walks around, when there are not many people in the vicinity. Peace, quiet, you can also say isolation. It is not really isolation, just that there needs to be nothing observing me. This is why I prefer the surroundings to be peaceful, empty, and so on.
> But I don't see it as connected to the computer's presence; I think that if I were doing something quite different, it would be the same. After all, sometimes I work without a computer, somewhere on... no, without a computer would be an overstatement—even when I am not at home, I have to sit at some computer. No, no, no, no, unfortunately I never work without a computer.

Emil starts out with an assertion that his work habits are independent of his actual occupation. Seeing the computer as a tool, he posits that its presence has no impact on the setting in which he operates. But even simple tools change the way in which work is performed, thus significantly affecting their user's spatial environment. Computers, being complex and useable in a variety of ways, have a much stronger influence on their user's behaviour. Programming is particularly notable here, for while it is theoretically possible to write a program—which is just a list of instructions for a computer to execute—without a computer, in practice it is unfeasible. Programs, especially complicated ones, require

vigorous testing, and eliminating the inevitable mistakes would be next to impossible without the machine capable of executing the program.

Emil's own story of his meeting with computers illustrates their impact on the IT specialist, and I shall quote extensive fragments to show the different aspects of computer's presence in one's work space:

> [Emil]: When I started studying [computer science], the computer was for the first year or two years a rather abstract idea. Sure, we did have some access to these computers, for there was some lab work, but that access was very limited, in the form of a few hours each week, or even one hour a week. We had only as much time as the lab work required, for there were few computers and many people.
> So the first association I have with computers is as a subject—it was a scientific discipline I was studying, something like geography, nature, as a certain branch of knowledge. This was what I was studying, what I was learning. This was computers from a theoretical perspective: algorithms, capabilities, and possible uses.
> Then there was a meshing of theory and practice, for computers starting appearing more and more often in the course of the studies. We started using them to do different things, we came up with various ideas and tried to implement them in real, existing [computer] systems. Then the studies ended and I never really felt like returning to the theoretical approach, I preferred practical work.
> And here there are two different things, for I use computers (well, not any more, really) in two ways. One has to do strictly with hardware: for a few years I tackled the physical side of hardware. I can dismantle a computer into various small pieces—smallest possible outside of a factory. I can take it apart and put it back together. I know more or less what is happening in this field—what is in, what is out, what new parts appear and what they replace. All of this is one part of my familiarity with computers.
> The second part involves using computers. This is something like what the normal user does—it is some kind of tool for my work. We write documents, create spreadsheets. Normal things, everyday needs satisfied by way of the computer. Then we print them, take these papers somewhere.

> But yet another use for a computer is writing software. This is something slightly different, because I'm making something that somebody will use on another computer. In a way I am creating that computer for the other person, for the person using that computer will see it as a single entity: software and hardware together.

In Emil's account, a computer is presented as capable of affecting the user in a variety of ways. It can be a subject of knowledge, a machine to be taken apart and reassembled, a medium for writing texts, and an object of creation. Each of these uses entails a different set of spatial practices, for each requires a different approach to work. As a subject of learning, the computer does not even enter the corporeal space of its student. As a collection of parts, it demands physical exertion as well as the use of a screwdriver. As office equipment, it turns its surroundings into office space. Finally, as the programmer's creation, it once again becomes partly intangible: after all, the final user's computer is usually not at hand, and the machine used for writing code is a medium that will not form a part of the final product.

Of course, Emil is right in that all of these tasks can be best performed in a peaceful and quiet environment, and relative solitude. But they also demand different amounts of contact with other people. Programming, as presented by Emil, involves discussions with other programmers, but that discussion is mediated by a computer (allowing for isolation in the physical space):

> [Emil]: [on the Internet] there is unfortunately an awful lot of garbage, but if one knows certain places, where there are things which interest us, then the Internet does not have to be treated as some kind of a giant dumping ground; we are interested in particular points, where we can find what we're interested in. I take advantage of these places and it is there that I fulfill most of my needs in the subjects that concern me. It is from there that I download data, it is there that I perhaps communicate with some people who know things about that subject, who can help me or whom I am able to help.

Emil's account shows that space does, in fact, significantly affect the daily life of even a solitary programmer. There are places one needs to know and frequent, and people to be met and befriended. But Emil was right in that none of this happens within the physical space—computer mediated communication is necessary for these contacts to go on. This means that even corporeal space is involved; after all, it is the wealth of online contacts that grants the programmer the possibility of corporeal seclusion. My questions, on the other hand, were wrong in that I asked about the physical and the virtual space separately, as if they were distinct entities. It turns out that actions cut across this division, and events happening in one space have consequences in the other.

Physical location can determine available infrastructure and access to data, such as the telecom company's confidential databases which were one of the reasons for DataBear's setting up of a branch office. The quality of available Internet hook-ups influences what information it is feasible to look for in the Internet. Questions of physical availability are not limited to technology, either—if other people are present to discuss particular problems, it is not necessary to look for answers anywhere further afield, such as on the Internet, or on the phone. Conversely, the data received in cyberspace are printed out and further distributed (or consulted) in the material form as pieces of paper; during my observation, such printouts included not only programming tips and pieces of code, but also e.g. a template to be used later for painting graffiti, i.e. actively changing the corporeal space.

Smooth operation

Integration between physical space and cyberspace can also be taken as a sign that computers, and any relations they might become part of, are already very well institutionalized, and thus largely invisible, at least for their participants. Bogdan hints at this as he relegates problems with computer hardware to the past:

> [JK]: Does the hardware that is present here, or the network, have any influence on how you all work here?

> [Bogdan]: See, for a long time already there are no problems with the hardware at all. The specifications for hardware are high if you want to play games. If you want to work then, with the possible exception of Java, which is very memory-hungry, there are no requirements to speak of.

Others, however, still consider the performance of their computer to be crucial to their work comfort. Much like Bogdan said, the component most often mentioned in that regard is memory and not the processor clock, the latter being the usual means of labelling computer performance in other settings. Janusz sees it as the foremost consideration in determining the superiority of one workplace to another:

> [JK]: Of all the places where you used computers, what caused you to think of some as better or worse?
> [Janusz]: Better? If they stand too close to each other, then it's worse, because it is crowded. And the better the computer is, the better the site. Larger memory and that sort of stuff. These are the only things I pay attention to.
> [JK]: So just when it is crowded, when there is too little room, then it's bad. Anything else?
> [Janusz]: Well, the computer itself, if it is good or not.

The main reason why I think the computer's performance, while crucial for providing a comfortable office, does not become an important point, has already been discussed. Computer hardware, even more so than software, falls into the realm of rationality—any problems involving outdated or insufficient hardware do not involve much uncertainty, as far as programmers are concerned. Being easily defined[42] and remedied, such problems tend not to worry DataBear's employees too much. Celina explains:

> [Celina]: Hardware. You know, when for example there is not enough memory installed in the computer for a given program that I use, then of course it works slower, it is more bothersome. But that is well defined, one knows what to do to make it right [*laughs].*

[42]Deciding whether the particular computer is sufficient for the task at hand involves, of course, defining an acceptable level of performance. But memory shortage in particular can often lead to the computer's refusal to execute some tasks and/or crashes, making for obvious cases of failure to perform.

Nevertheless, I still have some doubts whether hardware (or, even more so, computers in general) has become so smoothly integrated into the interviewees' work environment as they claim. My observation— for example Andrzej grumbling at the erratic behaviour his computer occasionally exhibited—provided further proof of the computers' visibility and cruciality to the programmers' experience of their work space.

Stability and drama

Even if the socialization of computers was not seamless, no dramatic changes seemed to be in progress during my visits to DataBear, and none of the interviewees hinted of notable transformations happening at the time. It is not surprising for, as John Law (1994) notes, an ethnographer is invariably a witness of the mundane rather than the extraordinary. This is caused only partly by the necessary brevity of the time an ethnographer spends in the field. The other reason, Karl Weick (1969/79) explains, is that meaning is always constructed retroactively, and significant events (and times) can only be perceived as such through narratives .

Assurances of their uniqueness notwithstanding, the interviewees exhibited a certain belief in the universality of their preferences. They regarded answers to my questions about spatial arrangement as "obvious" and not really worth talking about. But the details of the endorsed vision differed, and while e.g. DataBear's headquarters was seen by Celina as an ideal working place, Bogdan has a different view.

> [Bogdan]: there is a problem with available room here—there are no comfortable places to work. As you have seen, we had to go for a walk to be able to talk. And the place is boring.

Regardless of the differences, none of the interviewees demanded a significant reordering of their mode of working. Some arrangements were taken for granted, such as stationary working place, or continued access to the same computer if one was spending significant time in a given location. The possibility of keeping around the things one considered

helpful for working on a project, or of printing out useful information was never doubted or questioned. The option to customize one's computer's settings to one's liking was also taken for granted.

I would like to contrast this confidence with a dramatic story of an attempt to radically reconstruct space, told by John Seely Brown and Paul Duguid (2000). They told a story about the advertising agency Chiat/Day's attempt to institute "hot desking"—an office design in which the employees had no fixed space or equipment, but were instead required to sit in different places every day, using office tools (i.e. laptops) checked out from the reception when they arrived in the morning. The new office was entirely paperless, and so there was no place to store papers, documents, or indeed anything from one day to another. As laptops were checked out on the first come, first served basis, one could not expect to even get the same machine each day—after all, they all had the same functionality.

The employees did not take too kindly to this development. They were used to having their personal possessions stored in the company, as well as to personalizing their company-issued equipment. They did not think it was enough to customize the settings for one's computer account (the network infrastructure allows these settings to transfer onto any of the laptops one might be using in the company), personalization of the physical equipment was required. People started to store their papers in the trunks of their cars, carrying them into the office and back out every day. Laptops were similarly hijacked as the employees "forgot" to check them in when going home.

Attempts were also made to reintroduce the outward signs of hierarchy that the new ordering strived to eradicate. Certain areas were designated better than others, and fiercely fought over. When forced by the management to move around every day, people

still stuck to the groups consisting of their departments, relocating in nomadic groups rather than mingling as per the management's intention.

> The daily unsettled space created daily turf wars. Departments tried to pull rank on each other, each claiming favored areas because it was "more important." Account executives and creative departments went to battle over pecking order. People with sufficient authority and power pulled rank on those without, seniors shooing juniors away from comfortable spots. Executives with assistants would order the latter in early to hold a place for their boss. And so on. (Brown and Duguid, 2000: 73)

Mary Jo Hatch (1997) relates a similar story in which a company building was purposefully designed with no obvious status symbols. No bigger rooms, no higher quality furnishings, and no executive parking places singled out those in power from the crowd. Those who felt entitled to display their exalted position were understandably frustrated. In the end, cheap coatracks provided in limited supply, originally given out to everybody who bothered to ask, were (informally) adopted as signifying status—they were snatched up and kept in the offices of the most powerful employees.

> Petty though this might seem, the turf wars remind us that offices involve much more than the simple flow of information. Office space is not neutral ground. Everyone who works in one knows that, for better and for worse, offices are dense with highly charged social relations. Power, tension, authority, and insecurity are all closely interwoven. They can help get work done, and they can hinder it. The troubles at Chiat/Day indicate how the structure of the conventional office, while it may pander to petty fiefdoms and yearnings for a window or a corner office, helps keep social tensions and turf war in check. Any one settlement may appear less than optimal, but it may nonetheless be better than no settlement at all (Brown and Duguid, 2000: 73).

The tension evoked by the changes at Chiat/Day recall Yi-Fu Tuan's (1977) opposition between place and space. The management attempted to locate the new office completely within space, perceived as a new competitive way of organizing mirroring the

smoothness and free flow of the Internet (and of the networked society). The employees, on the other hand, wished to retain the sedentary character of place, that is familiarity, rootedness, and the sense of belonging. In the end, the company reverted to a more traditional structure, as the employees successfully resisted the pressure to abandon all the trappings of locality. Brown and Duguid do not, however, see their story as a cautionary tale against changing the traditional office structure.

> Breaking from a structured office to hot desking, however, suggests that the only two alternatives are closed stables or a stampede. Between these two lie more subtle uses of office space that can enhance working conditions, build channels of coordination and communication, and improve the quality of the work done (Brown and Duguid, 2000: 74).

It would be hard indeed to locate DataBear's offices (both the headquarters and the branch office) at any of the extremes. The organizational structure is rather loose, as project-oriented teams are led by the people with the best knowledge the particular field. Those positions change according to the tasks involved, so the employees with some experience regularly both partake in and lead teams on different projects. Status symbols are largely absent, an attitude strengthened by the director's refusal to take up any for himself.

At the same time, personalization of the surroundings is quite widespread—the branch office being an exception due to its transient character, and also due to the high rotation of the personnel there; only a few people are assigned to the branch office on a semi-permanent basis, most come only for a short time while predominantly working at the headquarters or at home.

Home as timespace

The last option is fairly widespread among those whose work does not require much personal contact or access to confidential data. As Emil explained, it is quite possible to gain access to necessary support and help for programming without leaving one's home,

and such an option definitely saves time that would have otherwise been spent on commuting. As access to shared files is needed, some kind of a network connection is a must. Phone bills may pose a problem, but not an insurmountable one.

Bogdan identifies remote work as the single most common use of the net in the company. At the same time, after explaining that distance from home is the single issue determining his preference for the headquarters over the branch office, he offers the following commentary:

> [Bogdan]: [People use the network] to work at a distance, most of all. A lot of people work from their homes, because it is easier for them. This works particularly well for people who are not able to come here all the time. The costs of doing that are low nowadays.
> ...
> [JK]: Why don't you work from home?
> [Bogdan]: Because that makes no sense whatsoever. Why should I work at home? Take up my private time as well...

Even considering that Bogdan might have misheard me as asking about work *at home* and not *from home* ("w" and "z," Polish for at and from, sound very similar in slurred speech), the answer is very interesting. It speaks of Bogdan's construal of home as a space-time combination, one that conflates the surroundings and the free time into one concept. The time spent at home is free time, and therefore working there would be an intrusion onto one's leisure hours. If one agrees with Karl Marx' (1894/1978: 440) remark that "the realm of freedom... begins... beyond the sphere of actual material production," then relocating the realm of production into one's home can have disastrous consequences; corporations are rarely known for voluntarily respecting boundaries between work and leisure, and it is easy to lose sight of one's free time. A more recent (and to the point) analysis by Brown and Duguid similarly supports the validity of Bogdan's viewpoint:

> Home office workers... lack necessary peer support. Consequently, with current technology, money-losing futzing, late at night and early in the

> morning, is endemic to the home office. Lacking the boundaries and structures provided by office life, work spills relentlessly over into private and family life (2000: 77-78).

It seems that, for IT workers at least, peer support is largely available through the Internet, particularly when it pertains to the technical matters concerning programming. It might not work as well in regards to time management or workplace relations; as the interlocutors are far removed physically and socially from each other's localities (and temporalities—Internet contacts can well span across many timezones), their knowledge of and relation to each other's situation is quite different and less immediate than that of workplace companions. Zygmunt Bauman (1989/91), analyzing the Holocaust, posits the idea of the social production of distance, in which technology, among others, is seen as a tool for distancing oneself from the morality of one's actions, while at the same time facilitating action at a distance. Of course, not all technologized relations are used for social distancing—numerous examples of Internet relationships (cf. Turkle, 1995/7; Markham, 1998) are ample examples of the opposite trend. But it is possible to use information technologies as a tool for mediating purely task-oriented social networks structured in a way which distances the participants from relations that do not involve the problem at hand. I suppose such modes of communication lie behind both Bogdan's and Brown and Duguid's worries.

As Bogdan noted, though, remote work has numerous advocates (and adherents) among DataBear's employees, at least as one of the working modes. Apart from the gains from avoiding commuting, the greater freedom of tailoring one's working environment according to one's tastes is a definite plus. And—a flip side of peer support—working without direct supervision and peer pressure can have its own benefits.

Crowding

The opposite of the loneliness threatening those who work at home, overcrowding can be a problem for those who choose to come to the office. Most of the interviewees mentioned the need of ample space, but their explanations of what they mean by it differed somewhat. Krzysztof worried the most about other people interfering in his concentration:

> [JK]What do you need room for?
> [Krzysztof]: When you're concentrating on something, you need some space. If somebody walks around you, behind you, when you know somebody stands over your shoulder, you get distracted. That's all.

For Helena, it was enough room to put all the materials needed for the particular job, and not having to move around while working on the computer:

> [Helena]: What do I need a big desk for? You know, of course there are keyboards like the one here on a retractable shelf, but for example mine takes up a lot of space. And when you're working, doing something specific, you often use some papers, printouts, books, you put these all around you when you work. It would be nice if it was comfortable, if you could keep all these things at arm's reach, so you could just grab what you need. Also office supplies—stamps, pens, staplers, that sort of thing. It's about having it all near and not needing to get up to reach for these things.

Celina agreed as far as being able to spread one's supplies was concerned, but her emphasis was on the ownership of space. Not only in regards to being able to store one's private belongings (as in the case of Chiat/Day), but also in terms of personal responsibility for one's immediate surroundings. Having room means being able to shape the working environment depending on one's aesthetics or work style:

> [JK]: Is the actual place where you do your work ever a source of problems? I ask because a person working in the branch office complained about the lack of room there.

> [Celina]: It can be a problem. I don't like the place where we work at [the telecom company] either [*laughs*]. That place is crammed... well, crammed—it was much worse before. We used to have one room, now there are two bigger ones, though the computers are more crowded. Here in our room we have three desks, big ones, and there is still room between them. We also have our own cabinets. At the branch office, when somebody comes, particularly those people who are there only temporarily, then of course they're not going to get their own cabinet, nor a well-defined own space on the desk where they can put their things. And it's not as if some things are thrown away and cannot be found, but the problem is that next person adds to the pile and then forget about it. As a result, the place gets buried in piles of papers. Everybody is afraid to touch them for nobody knows whose they are or if they are still needed. Here I have my desk with my own toys, as you can see, and I know nobody will move them. If somebody comes and I'm not here, they can take my place temporarily, but it is generally my place and it is I who decide if there will be a flower here or a calendar there. It is much nicer that way.

Differing needs

Customization of one's work area is particularly interesting, and it finally brings me to the specific practices used to create the spaces of computerized workplaces. The issue is important because of the idiosyncrasies of the various people's work habits. A couple of quotes from Dariusz and Helena highlight the differences quite well:

> [Helena]: If you keep the keyboard on your knees it is very tiring and distracting.
> [Dariusz]: A keyboard on a long cable so that you can keep it on your knees.
> [Helena]: And when you're working, doing something specific, you often use some papers, printouts, books, you put these all around you.
> [Dariusz]: A good place for papers is the wastepaper basket.

These people obviously need quite different settings to feel comfortable doing their work, and thus the practices needed to construct the spaces are going to be different as well. Because of the richness of the encountered strategies, I shall present these as short

episodes, or vignettes, rather than try to subsume them in a model of the organization of computerized space. The departure from the generalizing mode I used in the previous chapters is also motivated by my diminishing distance from the actual experience of constructing spaces in contact with computers. Whereas in examining space in magazine discourse and in advertisement-inspired stories I grounded my research upon already abstracted accounts, here I was faced with the full complexity of the field. Because of this, I was much more hard pressed to make sense of my observations and interviews than in the previous analyzes, which were much more ordered to begin with. As Karl Weick (1995: 61) pointed out, "what is necessary in sensemaking is a good story," and therefore I shall try to tell a few stories involving the IT specialists constructing spaces in computerized environments.

Coding and huddling

One of the scenes from my observation that was often repeated with little variation begins with a programmer (which could mean the person I was shadowing or one of the other people working in the same room) silently coding, that is writing some part of a computer program. After a while, that person would stop typing, and start looking focusedly at the computer screen. Still later, he[43] would start muttering something about the piece of code he was writing. When nobody responded, the same (or similar) comment would be repeated louder, and then perhaps again, even louder, if still nobody reacted. Somewhere along the way, one of the other people in the room would express interest in the programmer's dilemma, and he would proceed to gladly explain whatever problem perplexed him. One of the listeners would then proffer advice and possible ways of

[43] Only a few women are employed at DataBear. At the time of the study, one of them tended to appear at the branch office, but worked in the different room than Andrzej, being thus shielded from most of my observation. I don't suppose the scene looked any different if it was a woman getting attention, but in the course of the study I saw it played out only between male programmers. For this reason I use a male pronoun when not generalizing my findings.

dealing with the difficulty, with perhaps some discussion on what could be the most appropriate solution.

Since the above scenario came to be repeated numerous times with very little variation (albeit with different actors) I assumed, taking a hint from conversation analysis (Shotter, 1993; Silverman, 1993) that I was dealing here with an event both structured and meaningful, repeated because of the results it provides. I am also reminded of Francois Cooren's (1999) reappraisal of the speech act theory and his identification of communication as the building block of organizing. This is because the vignette describes an attempt at both establishing communication and organizing, that is, to provide space and means for concerted action. The process starts with the solitary task of programming, playing itself out between the programmer and his or her computer. When s/he encounters a problem, however, such cloistered approach fails, because while programming is solitary, problem-solving is a group activity.

Back in 1980, the then prominent futurologist Alvin Toffler, awed by the early incursions the computers were making into social space, speculated that it is enough to "[p]ut a computer in people's homes and they no longer need to huddle (Toffler, 1980: 215)." The prediction, like most of what futurology had to offer, was quite inaccurate. Programming (that is, close interaction with computers) is both a solitary and a social activity. It involves constructing and operating within both isolated and open space. The actual code writing takes place in the former, without any outside input, but all major problems are solved through social discussion of the difficulties. Thus, in a way, closed, solitary space represents the free-flowing creativity while the open space of group communication symbolizes overcoming obstacles. Both are crucial to the programmer's work. They are very different, though, in their representation in the IT specialists' accounts of their own work. As I have already noted, the importance of the social space tends to be downplayed, while the solitary space of coding is presented as what programming is really about.

Moving space

A somewhat similar scenario involved Andrzej's attempt to discuss the piece of code he was writing with another programmer, who worked in another room, connected by an open doorway. After Andrzej asked the first question, the other programmer appeared in the door, answering Andrzej, but apparently wishing to conclude the conversation as soon as possible. The answers didn't satisfy Andrzej, though; he clearly wished to involve the other person in hands-on discussion of the program. During the whole conversation, he sat on an office chair, rolling it between his interlocutor (when asking or listening to answers) and his computer (when thinking over the repercussions and formulating new questions). After a few rounds, the other programmer was tempted enough to step through the threshold and come up to Andrzej's monitor screen, proceeding to discuss the code the way Andrzej wanted, i.e. up close.

The scene, although brief, presents an interesting insight into the construction of conversational space. Andrzej and the other programmer had quite different views on what their discussion involved—the latter saw it as between the two of them, Andrzej wished to invite his computer (and the code thereon) into the conversation. He accomplished this by literally extending the discussion space—i.e. moving between his interlocutor and the computer as if all three of them were talking. In the end, the other discussant accepted the extended space, and stepped forward, minimizing the distances between the three involved actors, reconstructing the space once again, this time into a three-way huddle.

The above story shows not only a way of introducing a non-human actor into the conversation, but also a strategy of carving out a small social space in the quite limited area of an office. Because of the number of people present, the participants attempt to conduct their social engagements in a relatively unobtrusive way, and this involves

coming close to the person one is talking to. Andrzej fulfilled this requirement by moving up to whichever actor he was interacting with at the moment and, as soon as he agreed to the presence of the third actor, the other programmer also moved up to reduce obtrusiveness by huddling.

Spaces of sound and silence

Two of the computers in the double room occupied by the observed programmers were equipped with loudspeakers, but each of the working computers (including those with loudspeakers) had headphones attached or lying next to it. The speakers were used to play music, an activity accompanied by a recurring discussion of what music and how loud should be played. The debate was not very heated, however, as each of the programmers had an option to use one's own headphones to create a personal soundscape, either using music or by playing a game that provided its own sound effects. Indeed, as the multiplayer computer games used in the office placed the player's viewpoint firmly within the virtual world, headphones providing appropriate sound effects were considered a necessary component of gaming. This meant that in order to engage in a social activity of game playing, each participant needed to create a barrier separating his soundscape from that of the other participants.

Headphones and loudspeakers were also instruments for creating different spaces. The two speaker systems divided the office into two zones of influence; indeed, a discussion on how loud the music should be ended with the verdict that it should not interfere with listening to the music played by the other computer. Against this background music, each person could establish his or her own personal space by using headphones. In an interesting twist, many people used headphones that were not their own; when at one point one person attempted to locate his own headphones, he discovered that almost none were connected to the computer of their owner. Thus, while each people carved out

their private personal spaces, they did so using other people's headphones. Even as space was established (and performed) as personal property, so the props used turn out to be used as if owned communally.

This little paradox illustrates some of the intricacies of the practices of space construction used by the programmers. Many spaces overlap within the same physical area, and all of them are constructed socially. The personal, isolated space created with the use of headphones is superimposed over the larger soundscape, as well as over the communal space of the headphone pool. Spaces of group conversations bubble out of the solitary spaces of coding, and collapse back again when the particular problem is solved. Resources shared by various people within the office inscribe other spaces, and links with the outside world different ones still. An attempt to isolate any particular space can only succeed through taking it out of the original context, out of the practices that created it in relation to other spaces.

A programmer in love

During the observation period, Andrzej fell deeply in love (with a person having no ties to DataBear). This had a strong and obvious impact on his behaviour as all his thoughts and actions tended to drift towards the person he was in love with. He spent much of the time in the office using an Internet messaging program to communicate with her—silently, via a text-based interface. At one point, a colleague asked him if he were "chatting," and, after receiving a positive answer, did not try to include him in any conversation, talking instead to other people present in the room.

This, of course, an example of one more space being constructed, this time around a private conversation. The other people accepted this construction, and Andrzej was treated as a person engaged in conversation, albeit a silent one, and therefore excluded from the office soundspace. People talking on the phone were treated similarly: various

conversations were taking place around them, but they were not expected to get involved. The differences included silence (the programmer's Internet chat does not involve sound), the use of computer (used before in constructing solitary spaces), and the high emotional engagement (and the accompanying wish for privacy).

The episode not only shows the creation of space reaching far outside the physical bounds of the office, but also, more interestingly, the construction and maintenance of space that had little in common with the other spaces Andrzej was involved in. That was one of the reasons why the involvement placed him largely outside the office space, severing his links with most of the social activity within.

Sherry Turkle (1995/7), studying Internet users dealing with numerous unrelated spatial contexts (such as the corporeal space, chatlines, and virtual worlds), proposed the concept of a windowed self, fragmented into numerous and largely independent instances, each responsible for communication within a particular space. N. Katherine Hayles (1999) promotes a similar idea of a (post)human self consisting of semi-autonomous, task-oriented agents, with the singular consciousness serving only as their coordinator.

In the story of Andrzej's conversation, however, a certain paradox appears. On the one hand, involvement in an Internet-facilitated space of conversation requires continued presence in largely differing spaces—in this case the corporeal one of DataBear's office and the virtual one of the Internet chatline. On the other, the experience of talking to the object of one's love is a totalizing one, and difficult to realize as only one of the many windows that comprise one's self.

But if one abandons the idea of spatial boundaries necessarily conforming to the physical ones, the paradox resolves itself. A space, involving Andrzej sitting in front of his computer, and the other person in front of hers, joined by an Internet connection, can be seen as just as coherent as one involving Andrzej and the DataBear office. In such a view,

Andrzej's love conversation can indeed be understood as a totalizing experience, excluding him from the other spaces constructed around his office. This seems to be the interpretation practiced by his co-workers, who seem capable of excluding him from their actions and conversations without denying his corporeal proximity.

In the previous chapter, I used the metaphor of the alchemical wedding to describe the point uniting divergent spaces. In the one before, cyberspace was shown as representing the spirit in the body-mind-spirit triad. It should not be surprising, then, that love can be the key to the single (and singular) space constructed in the computerized setting, cutting across the corporeal/virtual divide and presented in the conclusion of this chapter.

Chapter 10: Conclusions and Comments

Having presented three different accounts of how space is constructed and performed in computerized settings, I would now like to look for the unifying themes tying these disparate views together. Obviously, while the foremost subject of this thesis has been the construction of space, the other important issue reappearing all the time has been the boundaries between various spaces. My examination started with a fairly strict division between cyberspace and physical space, and proceeded to show alternative ways of construing meeting of spaces: not as a single boundary, but rather as a multitude of overlapping spaces, impossible to isolate or circumscribe.

Interstices

In many ways, the spaces of computerized environments fit Bruno Latour's (1987) description of sociological or technological black boxes, i.e. unexamined constructions which can always be opened only to find more black boxes within. These "smaller" boxes in turn contain even more black boxes and so on ad infinitum in a procession largely reminiscent of the Russian *matrioshka* dolls. The space constructed around computers is similarly elusive to the observer, and all its boundaries disappear upon closer inspection. In the end, it is up to the researcher to decide which of the black boxes to leave undisturbed, i.e. which constructs and spaces to accept as meaningful or useful. It is possible, but not very useful in terms of examining spatial relations, to stop at seeing the dichotomous corporeal and virtual spaces, or to move towards a more complex model of spatiality. It is also possible, as I have done in the previous chapter, to eschew general models and concentrate on local practices instead, but none of these approaches provides a final understanding that could not be revised or reexamined.

William Gibson, whose work I have been using as a referent, usually presents space as a dichotomous construct, while focusing on passages between these two well-defined spaces; the means of traversal range from projecting human psyche into the network to Artificial Intelligences asserting influence over corporeal space to bodily journeys between the virtual and physical realms. But another current of his work concentrates on more blurred boundaries, and on the liminal spaces straddling them. *Johnny Mnemonic* (1981/7), a short story set in the same milieu as *Neuromancer* (and filmed in 1995), describes a community existing on the fringes of the city, of the law, of society—technological slums inhabited by a group of societal outcasts calling themselves "lo-teks" (from low technology). The Robert Longo film politicizes the gang as anti-corporate rebels, but in the short story these outcasts seem concerned only with their own survival. The Lo-Tek territory offers refuge to the protagonist due to its liminality rather than any political affiliation; the lack of defined ties to other spaces forms a means of escaping the oppressiveness of the outside world.

In *Virtual light,* Gibson (1993/4) revisits the theme, describing a similar community, located on the Golden Gate Bridge in San Francisco. Inhabited and loosely governed by squatters, the Bridge forms possibly the last truly public space in an otherwise privatized city. At the same time, it does not stand in direct opposition to the other parts of the city; rather it fills up niches left unclaimed by the other spaces, serving as a liminal repository of seemingly outdated and discarded ideas. In *All tomorrow's parties* (Gibson, 1999/2000), it is described as interstitial, a particularly appropriate word for blurry spatial boundaries, formed through accretion of miniscule differences rather than a single dividing line. Accordingly, the spaces constructed in the practice of computerized environments are aptly described as interstitial, as they blossom on the undefined boundary between the virtual and the corporeal.

The existence of interstices is also a symptom of the incompleteness of any given spatial model, hinting at other possible ways of ordering, other modes of conceptualizing and constructing space. The insterstices are what Giles Deleuze and Félix Guattari (1980/88) describe as lines of flight, the pathways for destabilizing (or deterritorializing) the dominant preconceptions. In fact, my whole study can be described as following the lines of flight found in computerized spaces. Starting with a simple dichotomic model, my study has led me through increasingly complex models towards a narrative retelling of the processes of constructing spaces. Each transition along this line has been a move away from simplification and towards a more ambiguous picture. In this way, I followed my initial assertion that no definitions can be final, that there are always lines of flight leading outwards, which in turn open up into other possibilities of further deterritorialization.

One other path I followed in making sense of the spaces constructed in computerized environment was to look for traces of the spiritual and the mystical. The spiritual dimension is either completely ignored in social research, or else to regarded as surface manifestation of deeper social processes. But forming as it does an important part of human experience, it deserves to be studied, even if a cautious approach is needed in order to maintain connection to the analyzed material and phenomena and avoid sinking into wild speculation. For this reason, my own references to the spiritual are largely metaphorical; I use concepts like astral bodies and alchemical wedding to describe aspects of spaces found around computers, rather than to directly engage the issues of spirituality. At the same time, metaphors are bidirectional, or reciprocal: to say that the virtual body is like a Jungian shadow means also to assert that the shadow is like a virtual body. In this sense, I turn to concepts related to spirituality as a means of accentuating the spiritual side of interaction with computerized space as much as for explication of such spaces through familiar concepts. There is also another reason for my use of spirituality in making sense of computerized environments: it reflects the mystical language used by some of the

proponents of new technologies to describe the wonders of computer-generated realities. It is an ambiguous issue—where Douglas Rushkoff (1994) speaks of reality hacking, Judith Squires (1996/2000) sees only "cyberdrool." Undoubtedly, any attempts to visualize the strange and glorious networked world of the future are bound to fail, much as the previous efforts to predict the future did:

> The mistake which the futurologists had been making was that they took isolated events that were going on in their time, and extrapolated from there to extraordinary futures. The sole thing that they failed to predict was that the future would be very much like the present. Only more dull (Hine, 2000: 1).

But the history of science and technology can also be seen as deeply steeped in mysticism and spirituality. Erik Davis recalls nineteenth century descriptions of electricity, seen as a new incarnation of the alchemical fire, both in its glowing and crackling manifestations and in the ideals looming behind its study:

> Electricity, in particular, would carry three different aspects of the alchemical imagination into the modern world: the fascination with the vitality of bodies, the desire to spiritualize material form, and the millenarian drive to transmute the energies of earth into the divine realization of human dreams (Davis, 1998: 42).

Margaret Wertheim (1999) points to the importance of mysticism in the history of space; she sees the proposed geographies of afterlife, and the belief in the plentitude of immaterial spirits as crucial in developing various forms of conceptualizing spatial relations. From this perspective, the future "very much like the present. Only more dull" can be a very spiritual vision indeed.

The anchoring of spirituality in everyday experiences is echoed by the last story of creating space: that of Andrzej's Internet conversation (as described in Chapter nine). It is somewhat different from the metaphorical character of my earlier discussions of spirituality, for it features love not as a metaphor, but as an important element of the

space's constitution. Of course, it would be possible to examine love as a social rather than spiritual concept, but to do so would be disingenuous to Andrzej's experience. As my focus remains on the actors' construction of space, it is beneficial to treat love as a spiritual black box whose presence and importance has to be acknowledge, but which does not need to be further explored within this study.

In the context of my examination of the boundary between the virtual and the corporeal, the space created within Andrzej's conversation is also particularly significant; its dissociation from physical geography undermines the validity of any divisions based on the assumption of the primacy of physical space. The disregard for the conventional notions of distance recalls Jorge Luis Borges' (1949/99) famous short story, *The Aleph*, describing the eponymous point that includes all space. The Aleph is

> the place where, without admixture or confusion, all the places of the world, seen from every angle, coexist.... The Aleph was probably two or three centimeters in diameter, but universal space was contained inside it, with no diminution in size. Each thing (the glass surface of a mirror, let us say) was infinite things, because I could clearly see it from every point in the cosmos (p. 281-283).

The most intriguing feature of the Aleph is of course its concentration of physically different spaces in one point. This can be used as a metaphor for the radical contraction of space that is often seen as one of the central features of postmodernity (e.g. Harvey, 1990). In a book geared towards the popular business reader,44 Frances Cairncross proclaims that distance is no longer a determinant of the cost of communicating. It is interesting to note that this thesis can hold true only for large distances, i.e. between places rather than within places. While it might be irrelevant whether one's interlocutor is in Berlin or in San Francisco (remember the time shift, though!), it is still crucial whether

44This is attested to, for example, by the cover blurb introducing the author as being "of The Economist."

s/he is or is not next door. At the same time, it would be overreacting to postulate, as Deirdre Boden and Harvey Molotch (1994) do, a "compulsion of proximity" that overrides the usefulness of other forms of contact. If intimacy can be achieved in computer mediated communication, as attested to not only by Andrzej's love conversation but by numerous accounts of long-distance intimate relationships (Turkle, 1995/7; Baker, 2000) as well, so can other forms of highly involved contact. Or, in other words, copresence (a word used by Boden and Molotch) can no longer be seen as dependent on physical proximity.

But the story of the Aleph touches on more than just compression of space. Borges is keen to point out the impossibility of expressing the infinity of spaces contained within the Aleph:

> I come now to the ineffable center of my tale; it is here that a writer's hopelessness begins. Every language is an alphabet of symbols the employment of which assumes a past shared by its interlocutors. How can one transmit to others the infinite Aleph, which my timorous memory can scarcely contain (Borges, 1949/99: 282).

The inexpressibility and, I would argue, incomprehensibility of the infinite lies at the heart of the social construction of space. The abolition of physical distance as the supreme organizing principle of spatiality does not lead to a lived-in Aleph, in which all spaces coexist simultaneously. Rather, it leads to the creation of spaces organized along different lines than physical proximity; the pathways of Internet connections can form just one such alternate ordering principle.

Borges' story can also be read as highlighting the difficulty of using conventional language as a means of exploring spatiality. If one chooses to avoid the pitfalls of stereotypical meanings and reductionist simplifications, one runs into the problem of inadequacy of the available vocabulary. Edward Soja's (1996) *Thirdspace*, which explicitly invokes the Aleph for examining Henri Lefebvre's notion of produced spaces, provides a good example of

the latter pitfall; the book is full of neologisms and strange word contortions such as "an-Other," "thirding-as-Othering," and "real-and-imagined." It seems Soja is attracted to these neologisms not through a proclivity towards punning, but due to the difficulty of expressing his insights in the readily available language. The problem is not particularly novel as languages have always been best suited to communicating platitudes, which, after all, provide the most shared meanings and thus least ambiguities. Richard Rorty (1980/94) demonstrates the weaknesses of Descartes' arguments stemming from the use of language unsuited (and unused) for expressing Cartesian viewpoints. At the same time, the existing language provides the only basis for comprehensibility, and for that reason I have tried to keep this study largely free of jargon and neologisms. Nevertheless, I did not avoid using some non-obvious terms, like corporeal or abstract space, having found no readily available names for the phenomena I wanted to describe, even if I did not resort to outright neologisms.

The reconstitution of space as unrestrained by the necessity of physical closeness is largely dependent on new technologies. Perhaps not because such technologies are crucial for the spatial reorganization, but because they make it much easier. After all, already the invention of writing broke the immediacy of conversation, allowing for long-distance relationships conducted through letter writing. The telephone network was yet another milestone technology in that regard. But computer mediated communication as well as mobile telephony drastically reduce the effort and time required for sustaining a relationship not coupled with physical proximity.

Non-human actors

The centrality of technology to the creation of contemporary spaces leads me to once more return to the issue of non-human actors' part in the social construction of space. For, as I indicated at the beginning, my account has been very much anthropocentric, simply

because I was most interested in the ways the human actors engaged in space construction. That approach neglects, however, the very important contribution of the non-humans, and particularly the premier technological actor of my study, the computer.

> Treating machines as dumb objects ignores the extent to which we rely on them as key constituents of social life. Does it make sense to devalue the activities of machines in society, in principle and in advance, when we humans attribute so much power to these activities (Downey, 1998: 238)?

The same story I presented in the previous chapters, however, can be also told in a somewhat different vein. Below I shall attempt to provide a short reinterpretation of my study in a language less biased towards underlining the human agency.

The basic structure of the narrative does not change, and again it follows the successively fragmenting dichotomy between the corporeal and the virtual space. The difference lies, of course, in the appearance of the computer as a newly important actor. In this dichotomy, it plays the role of a gatekeeper, straddling the boundary between the corporeal and the virtual. It regulates all traffic between the spaces, mediating any attempt to enter cyberspace on part of the user as well as any appearance of the virtual space in the physical realm. The monitor screen, loudspeakers/headphones, the keyboard, and the mouse are all used for negotiating this boundary. They are all also a part of the computer, and their functioning and integration is necessary for the traffic between the corporeal and the virtual to occur.

At the same time, the Cartesian mind/body division is just as acutely felt by the computers as it is by the human actors. Here it corresponds to the software/hardware distinction, and similarly maps onto the virtual and corporeal spaces respectively. Software, the computer's programming, has no obvious material basis (although it is, of course, always stored in a material form), while hardware possesses no apparent non-material ingredients (although it incorporates knowledge, design, and industry standards). Accordingly, the

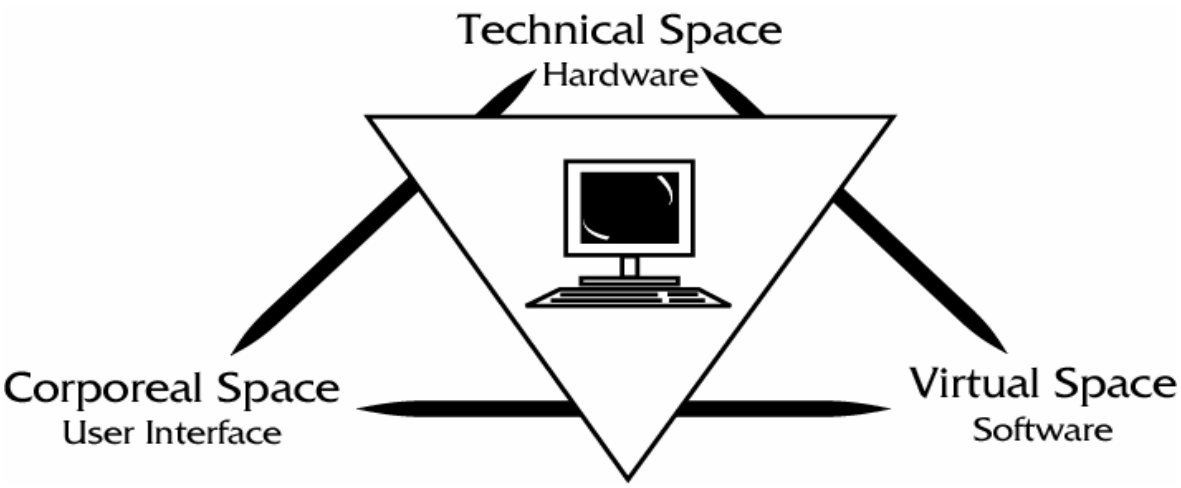
user's body interacts solely with the computer hardware (keyboard, mouse, monitor etc.) and the user's mind engages immaterial software (the operating system, applications, games etc.).

Expanding this model to make room for the third space, the technical space (following the analysis of computer press as presented in chapter six), complicates the picture somewhat. Much as in the anthropocentric narrative, the associations these spaces carry shift somewhat, as the triad no longer conveys the concentrated opposition espoused by a dichotomy. The link between virtual space and software remains intact, with programs still seen as intangible entities located in cyberspace, on the other side of the computer screen.

But the distinction now needs to be made between the computer's corporeal components, i.e. the hardware, and the means of its contact with the user, that is the user interface (UI). The former, being more concrete, is easier to point out: the electronic parts, the cables, as well as the keyboard, the monitor, and other assorted peripherals. As I have already determined in chapter six, only the plugged in, powered components are perceived as parts of a computer in the magazine discourse. In the tripartite model, the hardware is a part of the technical space: impersonal, logical, quantifiable, and easily represented on graphs and performance charts.

The user interface is more difficult to pinpoint, as it encompasses all the ways in which the user communicates with the computer. As such, it overlaps with parts of both hardware and software, but is not reducible to either. The keyboard or the monitor as physical

entities form a part of the technical space, but their use in the communication between the user and the machine locates them within the corporeal space of the user interface. Similarly, the ways in which a program interacts with the human user belongs to the space of the UI, while the program itself is clearly a piece of software. Yet the distinction, while not clear-cut, is an important one: the contact with the human body evades descriptions used in the computer magazines for making sense of the technical or the virtual space.



In this model, the computer as a social actor is located in the center of the diagram, in between the three spaces. It mediates all contact among the different spaces—my research revolves, after all, around computer spaces. It is not ascribed to any one space, but rather exists in the interstices between them, with only some of its aspects evident in the context of any given space.

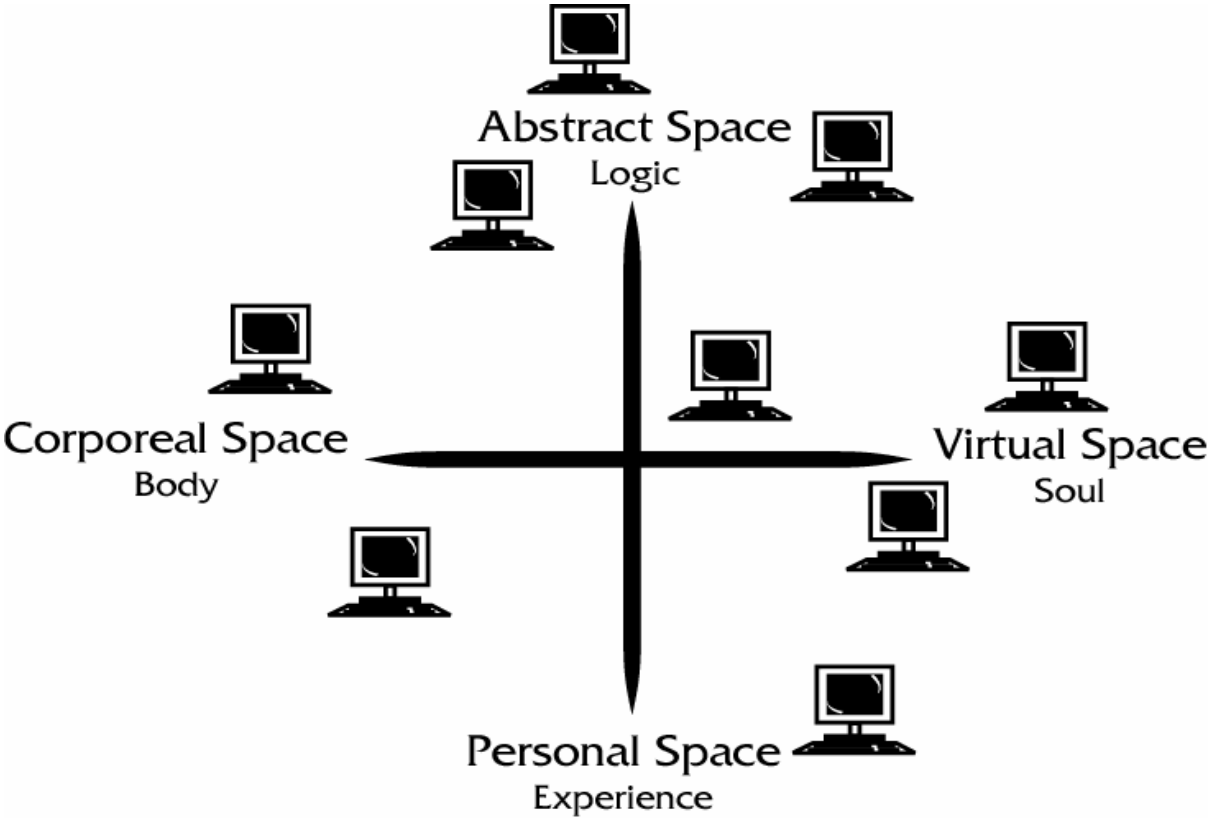
The concept of the user interface also allows for considering the senses involved in computer's communication, both on the side of the human and that of the machine. If one looks back at the history of computing and computer networks (Hughes, 1998/2000 and Wurster, 2002 are both very useful, and very different resources in that regard), it is easy to see that the computer's first sense was that of touch, used for interpreting keystrokes, mouse movements, reading perforated tape or, in a slightly different version, magnetic inscriptions on tapes and disks and so on. The user, on the other hand, started with gazing

at the machine (this includes both screen displays and printouts), and vision continues to be the most widespread means of retrieving information from a computer. Even that simple comparison easily evokes the power structure built into the relation—gaze having long been the privileged sense in the Western civilization (Berger et al., 1972/97), if not in the entire human conduct. The evolution of computers, however, testifies to their growing emancipation in that regard, as the devices providing senses of hearing (microphones), and vision (in the form of scanners, digital cameras, and optical drives) become more and more of a standard in computer paraphernalia. At the same time, sound became another standard means of computer expression (speakers being mounted in almost every contemporary desktop system), and technologies involving computer-generated tactile stimuli are becoming more and more popular: force-feedback mechanisms provide vibrations and shaking in various games, and context-dependent, variable-resistance computer mice and tablets allow for more precise data input.

The computer posited as subjected to the user's dominating gaze shows another aspect of its positioning as the tantalizing object of sexual desire, and the taboo on the adults' physical contact with computers in magazine advertisements. At the same time, the collected stories analysed in chapter eight present a less demeaning role: the machine appears as more of a romantic partner. This includes a relationship with a human actor in the western story [3; fig. 7.15] in which a cowboy finds a printer as a bride (though the questing hero obviously strikes a more powerful figure) and with another technological actor in the narrative of one printer falling in love with another [27; fig. 8.11].

Both these stories highlight a difference in treating technological actors between the magazine discourse and the narratives I collected. Whereas in the former it was possible to abstract a single computer actor representing all the actual machines, the technological characters in the stories are treated as distinct individuals resisting such conflation. The computer constructed as a singular actor is forced out of the stories' space together with

the similarly impersonal technical space. Instead, there is a multitude of different technological actors taking part in the various narratives.



There is not too much to be added about the interview and observation material. As I have stated in the analysis presented in chapter nine, it does not lend itself easily to presentation in the form of a simplified model, and is also difficult to summarize. Here, I shall restrict myself to pointing out some of the interactions in which the computers played the most active role in constructing spaces.

For the programmers, the computer is first of all their most important work partner—its presence and cooperation is necessary not only for the task of programming, which is what my interlocutors regarded as real work, but also for the less glamorous tasks like preparing presentations, writing reports, or keeping logs of their work. In this role, the computer is responsible for much of the working environment, as it is in the mutual relationship with the programmer that the work is defined and performed.

Computers are also involved in managing the contacts with the outside world, and in establishing spaces for exchanging advice and experiences. Emil, the programmer working mostly in physical isolation, that is alone with his computer, depends on the machine for allowing access to "certain places, where there are things that interest us," as well as for mediating communication with other programmers working on similar problems to his own. Computers are also involved in creating spaces for discussion among DataBear employees, for whom online messaging is an important way of sharing thoughts, ideas, and jokes even with those in the different physical location, but also with people sharing the same corporeal space. Also, perhaps most importantly, it is computer networks that allow a group of programmers to work simultaneously on the same project, shared over a number of different computers engaged in constant communication.

Partitioning corporeal space is similarly accomplished with an active participation of computer actors; the non-humans form focal points for both solitary and huddling programmers, and their loudspeaker and headphone systems help to establish common and private spaces. The computers corporeal presence, in the form of cables, cases, keyboards, mice, monitors, and peripherals is instrumental in determining the physical arrangement of the work space.

To sum up, computers are involved in almost all aspects of constructing spaces around them, and acknowledging the agency of non-human as well as human actors can help to give a fuller picture of the processes involved in producing and maintaining the spaces in computerized settings.

Closing remarks

This brings me to the final point of this chapter—the question of the possible benefits of this and similar research and of usefulness of this very analysis. It is clear that this study provides no clear answers, and that there are no ready-made practical applications

stemming from this study. However, I hope that I have managed to call into question some of the seemingly obvious properties of space, such as the apparent dichotomy between the physical and the virtual spaces, the solidity of spatial and bodily boundaries, and the passivity of non-human social actors. According to Wojciech Burszta (1996), an anthropologist is someone thriving on problematization, who can come up with various descriptions of the field, but never with an assurance of having finally solved the riddle. In this sense, the present study is anthropological in its approach to the computerized spaces; it employs what Barbara Czarniawska (1992: 73) calls an

> *anthropological frame of mind,* expressed by not taking social realities for granted. This means, on the one hand, modesty and openness toward new worlds and new meanings, and on the other, a constant urge to problematize, to turn what seems familiar and understandable upside down and inside out.

However, as Bowker and Starr (1999) argue, categorization and pigeonholing is not only inherent to every human activity, it is also quite often both necessary and beneficial. With that in mind, it is important to note that the various models presented in the course of my study serve not only as waypoints towards the conclusive dissolution of definable spaces, but also as potentially useful ways of conceptualizing computerized space. It is, however, important to understand that such models are only crude, if practical, simplifications.

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Alien: Resurrection (1997). Directed by Jean-Pierre Jeunet. Screenplay by Joss Whedon.

Armageddon (1998). Directed by Michael Bay. Screenplay by Jonathan Hensleigh and Jeffrey Abrams.

Blade Runner (1982). Directed by Ridley Scott. Screenplay by Hampton Francher and David Peoples.

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Hardware (1990). Directed by Richard Stanley. Screenplay by Steve MacManus, Kevin O'Neill, and Richard Stanley.

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