Cyberspace Odyssey

Cyberspace Odyssey:
Towards a Virtual Ontology and Anthropology

By

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For Joep, Joris and Elize

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ANALOGUE FOREWORD

This book was born out of a fascination. It records a journey through cyberspace that lasted almost twenty years. The beginning of my journey more or less coincided with the introduction of the World Wide Web and Virtual Reality in the early nineties, when graphical browsers transformed the one-dimensional, text-oriented Internet into a two-dimensional multimedia tool, and Virtual Reality promised to lead users through the computer screen into a three-dimensional world. Within a couple of years, what was once a science fiction fantasy had become everyday reality for millions of users. With many others I witnessed something of which the full impact was still invisible, but which irresistibly suggested that it was going to change the world and ourselves fundamentally. Journals such as *bOING bOING*, *Mondoo 2000* and *Wired* became the enthusiastic mouthpieces of the euphoric expectations that accompanied this technological revolution.

By now, twenty years later, we cannot fail to observe that cyberspace in many respects has developed quite differently from the way many had hoped for in these formative years. During the nineties, the idealistic and somewhat naive spirit of the counterculture movement of the sixties that blew through cyberspace largely lost out to the hypercapitalism of Silicon Valley. In a very short time, cyberspace was overwhelmed with advertisements and the virtual world increasingly became an integral part of the Western late-capitalist consumer market and global information society. The implosion of the dotcom economy at the end of the nineties and the still persistent counter forces–ranging from hackers and Internet activists to anti-globalists and cyber terrorists–temporarily slowed down the global commercialization of cyberspace but did not stop it. In the first decade of the new millennium the development of Web 2.0– the augmentation of the 'good old Web', technologically and ideologically with the help of social software and underlying databases (cf. De Mul 2008a, 2009)–signalled a new stage in the ongoing exploration of cyberspace.

What these developments have shown is that cyberspace is not an autonomous free zone beyond our everyday life, but a space that is strongly interwoven with our daily reality. On our 'emigration to cyberspace' we not only brought with us many of our offline characteristics,

organizational structures and prejudices, but conversely, with the help of countless chips in industrial machines, cars, planes, audio and video equipment, mobile phones, bank cards, surveillance cameras, toys, weapons, and implants such as pacemakers and electronic ears, cyberspace has started a massive material colonization of our everyday life and our bodies. Though man-kind's odyssey through cyberspace took another route than the one many of the travellers expected and hoped for–that's the destiny of every odyssey–its impact on our world and ourselves is nonetheless substantial. The mutual penetration of everyday life and cyberspace has made it impossible to withdraw from cyberspace by simply refusing to step 'through the screen' or switching off our computers. Even those who, either voluntarily or involuntarily, remain offline (and a large part of the world population still belongs to the second group) are increasingly being confronted with the effects of cyberspace. That our future will be a cyber future seems inevitable. Exactly what this future will look like is still unsure, because it will depend on the choices that we make today and tomorrow. But if we want to profit from the new opportunities and to avoid the dangers, we must try to understand what cyberspace does to our world and to ourselves. With this book I hope to contribute to this task.

The odyssey that ended in the writing of this book has not been a lonely adventure. Many people have accompanied me and helped me as I went along. First, I would like to thank my colleagues and students at the *Philosophy of Information and Communication Technology Research Center* (FICT) of the Faculty of Philosophy at the Erasmus University Rotterdam. Thanks to their efforts, which were partly made possible by financial support from the university and the Netherlands Organization for Scientific Research (NWO), and to research commissioned by several ministries of the Dutch government, FICT has become an inspiring laboratory of ideas. I also appreciate the many valuable insights offered by my Dutch colleagues Hans Achterhuis, Maarten Coolen, and Paul and Valerie Frissen.

My odyssey through cyberspace also brought me into contact with many colleagues from abroad. Most of the chapters in this book have originally been presented as lectures or published as articles. In adapting these texts for the present book I have gratefully profited from the useful comments of, among others, Daniel Andler (Paris), Curtis Carter (Milwaukee), Hubert Dreyfus (Berkeley), Aless Erjavec (Ljubljana), Jale Erzen (Ankara), Luciano Floridi (Oxford), Kenneth Gergen (Swarthmore), Jin Huimin (Beijing), Karl Leidlmayr (Innsbruck), Brian Loader

(Middlesbrough), Catherine Maurey (Paris), Ewa Rewers (Poznan), Dierk Spreen (Berlin), Hiroshi Yoshioka (Tokyo), and Yun Dong Hee (Seoul).

My sons Joep and Joris and my daughter Elize have been important guides during my initial wanderings in cyberspace. I remember with much pleasure our joint explorations of the virtual worlds of *Myst, SimCity*, and *AlphaWorld*, and I have learned a great deal from the uninhibitedness and ease with which they, as screenagers, moved through them. Often they had already found their way through the labyrinths while I–a typical product of the world of the book–was still reading the manual. They have inspired me to accompany this book with a website that not only links it to the electronic sources mentioned in the book, but also enables the reader to experience and download much of the artworks and software discussed in the book, plus–for the theory tired reader–some more or less serious games (see: www.demul.nl).

This book originally appeared in Dutch in 2002. Updated versions in Chinese and Turkish have been published in 2007 and 2008 respectively. The present English translation is based on the 6th Dutch edition, which appeared in 2010. Earlier versions of several chapters have been previously published in English as articles or contributions to books (see the Acknowledgements for details). The remainder has been translated into English by Michiel Wielema. My whiz-kid brother Sjaak was so kind as to program the analogue-digital converter on the website, which enables one to read the Digital Afterwork of this book. I'd like to thank Jeroen Timmermans and Marjolein Wegman for their bibliographical and editorial assistance, without which it would have taken much longer for this translation to reach its Ithaca.

Though my wanderings through cyberspace have been fascinating, the virtual temptations could never compete with the joy of the reunions with Gerry, who, as a contemporary Penelope, has been the final goal of my wanderings.

—Sanur, May 2010

ACKNOWLEDGEMENTS

WELCOME TO CYBERSPACE

ANOTHER POSSIBLE INTRODUCTION TO THE HISTORY OF HUMANITY

> There is yet another world to be discovered—
> and more than one! Embark, philosophers!
> —*Friedrich Nietzsche*

1 Philosophical Reflections of My Screensaver

The screensaver was invented in the days when computer screens were still in danger of a burn in when the same image was projected for too long. Originally the screensaver was a small program that switched off the screen if the computer was not used for a certain time. When a key on the keyboard was struck the program switched the screen back on. The screensaver was soon assigned an ornamental function. Programs were developed which instead of switching off the screen projected continually changing images on it, which also reduced the chance of a burn in. Originally, these were generally simple geometric patterns, but in the age of the multimedia computer they often are little masterpieces. According to personal preference it is possible to transform the computer into an aquarium of tropical fish complete with underwater sounds, give Donald Duck the opportunity to smudge the screen, or with the aid of an *ArtSaver*, allow yourself to be inspired at moments of non-productivity by the works of contemporary artists. The screensaver is an excellent example of something that continues to exist after losing its original function. Present-day computer screens are no longer in danger of a burn in and the screensaver now, and with much success, fulfils a completely different function from that for which it was originally designed.

Despite its simplicity–or perhaps because of it–the built-in Windows screensaver that I have been using for a number of years exercises a powerful attraction on me.[1] After a few minutes of inactivity, the screen changes into a starry sky and creates the illusion that I am moving at great speed through the universe. The effectiveness of this optical illusion is

astonishing. In fact the screen shows nothing more than a few white, gently quivering spots, gradually becoming bigger, against a black background. After they have appeared these spots move with increasing speed from an imaginary midpoint towards the edge of the screen where they disappear. Even when I try to concentrate on these movements on the flat surface, it is almost impossible to avoid the three-dimensional illusion. What particularly fascinates me about this screensaver, however, is its metaphorical meaning. The imaginary journey through cosmic space that takes place on my screen is a metaphor for the journey through *cyberspace*, the virtual world opened up by the worldwide network of computers.

In this book I attempt to answer the question of what cyberspace actually is, and, referring to a variety of its manifestations, I will examine how cyberspace changes (our image of) the world and ourselves. This investigation is occasioned by the increasing role cyberspace is playing in our lives. Cyberspace is not only–and perhaps not even in the first place–a new experiential dimension beyond geographical space or historical time in which human life takes place, but it also enters into various hybrid relationships with almost all aspects of our everyday life. That is to say that not only part of human matters is transferred to virtual environments, but at the same time our everyday world is becoming increasingly interwoven with virtual space and virtual time. In other words, the 'emigration to cyberspace' goes hand in hand with an (often inconspicuous) 'colonization of everyday life by cyberspace'. Those who pay for their daily supermarket shopping with the aid of a bank card not only carry out a transaction in an actual branch of that supermarket, but also in the postgeographical area of cyberspace. And those who turn on the radio and hear Erykah Badu sing her 1999 duet with Bob Marley– constructed with the aid of digital cutting and pasting (sampling), as Marley already died in 1981–not only find themselves in historical time, they also undergo a post-historic sensation and experience *augmented* space and time.

Because of the newness and in particular the strangeness of cyberspace, it is not easy to understand this postgeographical space and posthistorical time. This is undoubtedly the reason why in discussions of cyberspace refuge is often taken in metaphors.[2] Metaphors allow us to understand unfamiliar things by comparing them to more familiar phenomena. We speak, for example, about electronic *superhighways*, digital *cities*, and electronic *shops*. Metaphors are based on a certain analogy between the things that are brought together within the figure of speech. When, for example, we speak of an electronic superhighway, then

we are comparing the computer to a car, the cables and telephone lines to a network of roads, and information to the people and goods that are transported through this network.[3]

Although metaphors are indispensable aids in our attempts to open up the unknown and to understand it, they can also easily lead us astray. Because they compare the unknown to what we already know, they often conceal that which distinguishes the strange phenomenon from the known. The metaphor of the electronic superhighway is a good example. Although the analogy between a network of highways and a computer network helps us to understand the transportation function of the latter, at the same time the metaphor of an electronic superhighway conceals the postgeographical and posthistorical nature of Internet traffic. As opposed to a network of roads, the distance between two points in a computer network has very little influence on the time it takes to bridge them: usually it takes no noticeable longer time to visit a website on a computer in the house next to your home than one on a computer that is in a country on another continent. Because the metaphor of the electronic superhighway conceals this fundamental difference between the geographical and the virtual world it deprives us of the possibility of forming an adequate concept of the social, political, economic, cultural, and anthropological implications of the emigration to, and colonization by, cyberspace.

The metaphorical comparison of travelling through the universe and through cyberspace embodied in my screensaver also appears at first sight to pass over the differences between the real and the virtual world. However, on closer examination the metaphor of space travel offers a far better picture of cyberspace than the metaphor of the electronic superhighway. In the exploration of both cosmic space and cyberspace we are confronted with a world that possesses fundamentally different spatial and temporal qualities than the everyday world we live in. It is the geometry, physics and cosmology of the concept of *hyperspace* that can help us to obtain a better understanding of cyberspace and so aid us in our orientation in this new experiential space. Conversely, perhaps cyberspace can help us to form a more adequate understanding of cosmic space. And perhaps the similarity is more than purely metaphorical and the exploration of cosmic space and cyberspace are two forms of phenomena of a new stage in the human odyssey through space and time.

In order to acquire this insight we have to jump 'through the screen' and start a journey through the strange world of cyberspace. In our exploration we will try to understand how cyberspace penetrates and transforms our society, our culture, and finally our body and mind. This 'odyssey through cyberspace' will take us on a journey not only through

space but inevitably through time as well. The exploration of cyberspace is the preliminary last stage in an odyssey through time and space that started about seven million years ago with the emergence of the first Hominids. In order to obtain an adequate picture of cyberspace, we also have to travel through time. Let us start with a relatively small hyper jump.

2 Odysseus in Cyberspace

> Tell me, Muse, of that man, so ready at need, who wandered far and wide, after he had sacked the sacred citadel of Troy, and many were the men whose towns he saw and whose mind he learnt, yea, and many the woes he suffered in his heart on the deep, striving to win his own life and the return of his company. Nay, but even so he saved not his company, though he desired it sore. For through the blindness of their own hearts they perished, fools, who devoured the oxen of Helios Hyperion: but the god took from them their day of returning. Of these things, goddess, daughter of Zeus, whence soever thou hast heard thereof, declare thou even unto us.

These lines form the beginning of Homer's *Odyssey*, cited from the translation that Samuel Henry Butcher published in 1900. This epic poem, comprising more than ten thousand verses, is one of the oldest stories in the Greek and European history of literature. Experts have been quarrelling already for twenty-five centuries about the question whether Homer, who–if he really existed, even this is disputed by some scholars–lived in the eighth century BC, wrote down the story about the wanderings and return of Odysseus by himself. The eldest text of the *Odyssey* that is available dates from the sixth century BC. This version of the *Odyssey*, together with that of the *Iliad*, was written down by order of Pisistratus, the first tyrant of Athens, and his art-loving son Hipparchus for the festival Panathena, which was annually held in honour of Pallas Athena. But even if Homer really existed and did write the *Iliad* and *Odyssey*, the origin of these works certainly lies several centuries earlier. The cadence of the hexameters, the constant repetitions of formulas, stereotypic scenes and sometimes even complete verses, a number of striking inconsistencies and the peculiar mixture of Ionic and other local Greek dialects betray that the *Odyssey* stems from an oral tradition (Parry and Parry 1971). The verses were orally transferred from one generation to the other by rhapsodists, travelling singers, and the fixed formulations and repetitions helped them to memorize the epic. During their performances the singers could draw on

a 'database' of building blocks that, depending on the reaction of the public, could be recombined into a suitable whole. The writing down of the Homeric verses is an early example of what nowadays is sometimes called remediation (Bolter and Grusin 1999). Thanks to this remediation the oral tradition of the *Odyssey* was preserved, but at the same time, because it was a preservation in another medium, the character of the work changed fundamentally.

Of course, this does not mean that the *Odyssey* suffered from this remediation. After more than twenty centuries the work still enchants us. The reason for this is not only the fact that the story about Odysseus' decade of travel from Troy to his domicile Ithaca where his wife Penelope is waiting for him, consists of exciting adventures in strange places full of nymphs, monsters and gods, but also because the characters and the events can still strongly move us emotionally, in spite of the distance in time. And what no less appeals to us in the *Odyssey* is that hardly any other character in the world of literature than Odysseus better expresses the fate of a person who is continuously driven beyond his horizon. If the choice had been up to Odysseus, he would not have gone to Troy at all. That he, thanks to his slyness, could finally become the hero of the battle of Troy, was because an earlier ploy–he had attempted to prevent his military service by pretending to be insane–failed. And when the battle, after the many years' siege of Troy, was finally over because the Greeks conquered the city with the help of Odysseus' trick with the wooden horse, he had no other wish than to return to his beloved Penelope as soon as possible. However, he still was not to see her soon. The winds, stirred up by Poseidon, the god of the seas, again and again blew Odysseus' ship in the wrong direction, and brought him time and time again to new and uncalled for torments and temptations.

One of the reasons the–not always sympathetic–character of Odysseus appeals so much to us, is that his fate is in many ways the fate of humanity as a whole. From the very moment, some five to seven million years ago, that the first *Hominini* emerged in the savannas of East-Africa, the history of humankind has been an everlasting journey beyond the horizon. In the course of his evolution, man has spread out over the whole surface of the earth and in the last century, with aviation and the first manned space flights, has even started to explore cosmic space. Since the seventeenth century, the microscope and the telescope have disclosed spaces far below and above the limits of human perception. In art and religion, the human expansion has shifted to virtual spaces. And in cases where imagination does not come up to the mark, mankind from times immemorial–like Odysseus in the land of the Lotus eaters–has used drugs to artificially

expand the mind. The development of language and writing, too, has expanded the mobility of the human mind enormously. With language, man is no longer imprisoned in the present. Language discloses the virtual domain of the past and of history, which has made it possible to encounter characters such as Odysseus, who were imagined thousands of years ago by our ancestors, and to dream of the future and future journeys. Whether this restless journey is a result of human curiosity or of the essential homelessness of the human lifeform, it is intrinsically linked to the fate of mankind. Perhaps *Homo sapiens* more than anything else is a *Homo mobilis*, a being that with an increasing velocity travels though an increasing number of spatial dimensions in the hope to find its Ithaca (cf. De Mul 2005a).

Because of Odysseus' archetypical character, it is not surprising that the story about his wanderings has inspired writers, artists and scientists throughout Western history. In this tradition stand writers like Virgilius, who gave the Romans with his *Aeneid* their own counterpart of the *Odyssey*, and James Joyce, whose *Ulysses* explored the frontiers of modern consciousness, but also the European space probe *Ulysses*, which was launched in 1990 through the space shuttle *Discovery* and was flung in the direction of the sun via the field of gravity of the planet Jupiter. The name of the space probe not only refers to Homer's *Odyssey*, but seems also to contain an ironic wink to Stanley Kubrick's science fiction movie *2001: A Space Odyssey* (1968), which deals with a dramatic journey of the spaceship *Discovery* to Jupiter.

Kubrick's *2001: A Space Odyssey* is more than an exciting movie about the exploration of cosmic space. The film, as the program of the video edition of the work sharply summarizes, is "an epic tale of man's ascent, from ape to space traveller and beyond" (Kubrick 1997). Kubrick's cosmic version of the *Odyssey* not only masterly recapitulates the human odyssey through space, but also deals with the human odyssey through time. The film opens with the origin of man–the transformation from ape-man into human–and it ends in the twenty-first century with the transformation of man into a posthuman form of life.

What is striking in the movie is that both transformations are closely connected with technology. The first scenes of the movie show how the ape-man expands his territory and establishes his dominion on earth with the aid of tools, while in the last part of the movie the *Discovery* leads the astronauts beyond the frontiers of the perceptible universe and finally even beyond the human form of life. Technology, at least this is what Kubrick's movie suggests, marks both the starting point and the end point of the equally heroic and tragic odyssey of mankind through space. Technology

is an *ontological machine* that carries away the human world and mankind itself in a never-ending transformation.

What makes *2001: A Space Odyssey* such an apt illustration of the subject of this book is that in this movie ultimately it is not space travel technology, but the computer that brings about the transformation of *Homo sapiens* into a posthuman form of life. It is the computer that leads man into *cyberspace* and that finally will urge him to transcend himself. In the following chapters we will follow Odysseus on his–preliminary–last trip.

3 An Odyssey through Space and Time 1.0

Before following Odysseus through the computer screen, we will stock some conceptual supplies. Especially, I will dwell for a moment on the concepts of 'space' and 'time', which I have been using repeatedly in the foregoing and which will continue to play an important role, in various contexts, in the chapters to come. 'Space' and 'time' are concepts that we use in our everyday life smoothly, but when asked what they mean exactly, we often end up speechless. For many centuries, philosophers and scientists have racked their brains about the many mysteries connected with our experience of space and time, but so far this has not led to much consensus. Even with regard to the most elementary qualities of these phenomena, opinions often are diametrically opposed. This is not the place to give even an overview of all the questions that are connected with space and time. I will restrict myself to a concise conceptual analysis and a short historical sketch of both concepts, focusing on those aspects that are relevant for the subject of this book.

In ordinary language the concept '*space*' often refers to an empty space between things, for example, when we are looking for space to park our car, or when we, after buying a book, notice that there is no more room on our bookshelf to store it. These examples deal with empty spaces in the geographical domain, but we also apply this concept to other domains. For example, when we talk about the room in our budget or when we notice that our boss' order does not leave much room for negotiation. In these cases we use the word with regard to human action and refer to a set of possibilities that we have at our disposal to realize goals. Sometimes the metaphorical use is even extended to our experience of time, for example when we say that our agenda leaves no room for another appointment. Conversely, we sometimes use the concept of time to refer to spatial distance, for example when on my way to work I call a colleague to tell

her that I am still one hour from Rotterdam. As we will see, in modern physics too the concepts of space and time are closely related.

The ordinary meaning of the word 'space' has a long history (Torretti 1998). The etymology of the word space in Roman languages (*espace, spazio, espacio*) as well as in English, leads back to the Latin *spatium*, which refers to a distance or interval between things. However, from the late Middle Ages on, in natural philosophy and in the natural sciences the concept acquired a more abstract meaning that in modern culture–because of the mechanization of the worldview (cf. Dijksterhuis 1986)–has penetrated everyday language. This theoretical concept of space refers to a limitless extension that encloses everything that is. We find this concept already in the work of the sixteenth-century philosopher Bruno, who gives the following definition:

> Space is a continuous three-dimensional natural quantity, in which the magnitude of bodies is contained, which is prior by nature to all bodies and subsists without them but indifferently receives them all and is free from the conditions of action and passion, unmixable, impenetrable, unshapeable, non-locatable, outside all bodies yet encompassing and incomprehensibly containing them all. (Bruno 1879, I.8)

Thanks to the work of the physicist, mathematician, and astronomer Newton this concept of space has become dominant in modern science. What distinguishes Newton's concept of space from Bruno's is that he, following Descartes, conceives of space geometrically. On this view, space can be defined exactly, with the help of a three-dimensional grid. Newton was of the opinion that space is absolute. According to this view bodies are not only located and moving in relation to each other, but they also are situated in relation to space itself. Space, in other words, is independent of the bodies that it contains and would also be there if there were no bodies at all. Neither in philosophy nor in the natural sciences has there been much consensus about the ontological status of space. With regard to the question what space *is*, rather different and often contradictory answers have been given. Many followers of Newton regarded space as something that has objective reality. According to this view, space is a 'thing' or, in the language of the metaphysics of that time, a *substance*. The German mathematician and philosopher Leibniz, and a whole tradition that followed him in this respect, conceived of space on the other hand as a relational concept that refers to the mathematical relationships of things. If we forget the peculiarities of each thing and retain only its distance to the other things we obtain the notion of the

thing's place. Space is nothing but the totality of those relationships. "Without things, no space would exist" (Leibniz 1956, section 47).

The German philosopher Kant goes even one step further than Leibniz in the process of de-substantivation of space by conceiving of space as something that does not belong to the order of things at all. According to Kant space is a form of human sensibility, that is

> not something objective and real, not a substance, nor an attribute, nor a relation, but a subjective and ideal sort of scheme for mutually coordinating all external sensations in every way, which issues from the nature of the mind according to a stable law. (Kant 1981b, section 15D)

Whereas Leibniz still saw space, just like time, as a connection between things, Kant regards it as something *a priori* (that is: a product of human reason) that gives shape to our experience of the world. We could compare these forms–metaphorically–to a coloured pair of glasses. Just as for someone who is wearing red glasses all objects look red, human beings experience all objects as spatial. However, for Kant this does not mean that space is just a kind of illusion. Space is no illusion, but the phenomenal form in which things appear to human beings. Though subjective and ideal from an ontological point of view, from an empirical point of view it is objective and real (Kant 2004, 27, 41-2; cf. De Mul 2004, 58, 88f.).

In the philosophy of Heidegger we find an echo of this Kantian concept, when we read in *Being and Time* that human *Dasein* (literally: there-being) discloses space in its acting upon things in its world. In *Dasein's* use of all kinds of tools[4], which are connected with each other in a meaningful nexus, coherent spaces are being *discovered*, for example cosmic space in space travel, or being *founded*, for example the space of justice in the praxis of law (Heidegger 1996, 94-105). *Dasein* 'spatializes' things and acts: it brings them together and situates them to each other, and in doing so it discovers and founds nearness and distance. Unlike Kant, Heidegger does not conceive of space as a sheer subjective form. The discovery and founding of spaces is only possible in the encounter between *Dasein* and real things. Space is neither objective nor subjective, but is being disclosed in our active 'being-in-the-world'.

In the following chapters, in which I will discuss cyberspace in its various manifestations (such as computer games, hypermedia, informational sciences, virtual reality, brain-computer interfaces), we will meet several of these conceptions of space again. However, because of the ontological and anthropological perspective of this book, I will emphasize the role human beings and their technological and cultural artefacts play in the

discovery and founding of spaces. The ships in which man has sailed the seas have disclosed geographical space, just as space travel and astronomy have disclosed cosmic space and (electro)microscopes have disclosed (sub)atomic space. With the help of laws, buildings, and institutions we create social space, while magic and rites disclose sacral spaces. Once these spaces have been disclosed, they in turn structure our actions. The discovery of trade routes and the establishment of stopping places and trading towns result in specific space-time corridors. Spaces create, as I already noted with regard to the example of the room for negotiation, a repertoire of possible actions and interactions. This is also true for cyberspace. The hardware and software of worldwide computer networks disclose a virtual matrix, both beyond and interwoven with our everyday life-world.

These 'mixed spaces' emerge because human spaces always interfere with each other. Heterogeneous spaces interweave in many ways and form all kinds of hybrid connections, in which they can reinforce, weaken, or transform each other. A dominant space can conquer other spaces and reconfigure this space from within according to its own coordinates. We can illustrate this with regard to Homer's *Odyssey*. The narrative space in which Odysseus wanderings take place and that has been disclosed by the oral tradition, is closely linked to the geographical space in which Greek culture was situated. In the narrative space of the *Odyssey* the known geographical world of the day was quite adequately mapped. Moreover, the constant presence of the gods linked narrative space with the real (temples) and virtual (spiritual) spaces of Greek religious life. The description of the customs and traditions of other people disclosed the room for cultural exchange and trade and the love between Odysseus and Penelope showed the affective space of human intercourse. Because of the interference of all these spaces the *Odyssey* functioned for the ancient Greek as a kind of oral encyclopaedia and code of behaviour.

Odysseus' wanderings took ten years, the odyssey which I will deal with in this book lasts millions of years. In the foregoing, we already saw that spaces do not simply exist, but are being disclosed by human action. Spaces grow, shrink and vanish or are being transformed by other spaces. Spaces therefore also have a temporal dimension, they always 'take place' in *time*. Contrary to the concept of space, which often is conceived of as something static, in ordinary language the concept 'time' already has a dynamical connotation. Time is inherently connected to change, movement, processes, developments and events. According to a–spatial–metaphor time is a stream that passes us and all other all things. Standing in this stream we ceaselessly experience now-moments that approach us

from the future, are being experienced in the present and almost immediately vanish into the past. Unlike the three dimensions of space, the three dimensions of time have a different ontological character. Only the present seems to be real in a strict sense. Whereas a change in the spatial location of a thing does not change its grade of reality, having-being in the past or not-yet-being in the future takes away the reality of a thing or event.

When we look at the history of the concept of time, we can distinguish two different outlooks with regard to the direction of the course of time. This direction can be cyclic or linear. The cyclic view, that is closely connected with the everyday experience of the cyclic alternation of day and night and the cycles of the celestial bodies and the seasons, probably is the oldest. With regard to the cosmos as well as to human life, we find it, for example, in pre-Christian Greek culture and in Hindu and Buddhist cultures, but it is still present in modern science, for example in the theory that the universe periodically expands and shrinks.

When societies become more complex and start to develop more quickly, and changes become visible within a single generation, the cyclic notion of time gradually is complemented and partly replaced by the notion of an irreversible historic time. Monotheistic religions such as Christianity and Islam have played a crucial role in the development of this linear conception of time. In these religions time has a non-recurring beginning, in which the world was created by an almighty God, and a non-recurring end, in which the believers await eternal salvation and the non-believers eternal burning in hell. In the process of secularization in the Western world, this religious-linear conception of time gradually transformed into a historic-linear picture of time. However, in this modern picture we can recognize, in a disenchanted form, many characteristics of the preceding Christian eschatology and messianism.

Just as in the case of the concept of space, the modern history of the concept of time is strongly influenced by developments in the sciences since the sixteenth and seventeenth century. And also in this case Newton has played a role that is difficult to overestimate. In his physics his conception of absolute space is accompanied by the conception of absolute time. This is the time in which the universe exists, and in which physical, biological and historical events can take place. This absolute time would also exist without these events. For Newton, time is a linear, one-dimensional continuity that, unlike in the Christian conception, does not have a beginning or an end. And just as in the debate about space, critics of Newton have opposed his view with a relational concept of time. According to this relational view, time is nothing else than the changes

that occur in the physical universe. The question of whether time has a beginning is, still according to this view, identical with the question of whether there has been a first event–for example a Big Bang–in the universe. Without events there would be no time at all.

Since Hermann Minkowski's classical interpretation of Einstein's theory of relativity, time and space are no longer conceived of by physicists as independent entities. Generally, they speak about *space-time* and in this concept time is regarded as a fourth dimension in addition to the three spatial dimensions. This space-time continuum can be represented in a grid with four axes. Though in this theory space and time still have distinguishing qualities, they influence each other mutually. This becomes clear, for example, in time measurement: the intervals a clock displays are dependent on both the place and velocity of the clock. Though most physicists agree on this point, with regard to the question whether the notion of space-time supports the absolute or relational conception of space and time, the views differ strongly (cf. 't Hooft 1997).

And just as in the case of space, in the discussion about the ontological status of time there is a second point of controversy. Though most physicists and philosophers tend to regard time as an *objective* characteristic of the universe, others argue that it is a sheer subjective phenomenon. According to these critics of the standard view, the fact that we experience all events in terms of past, present, and future depends on whether these events happen earlier than, at the same time as, or after they occur in our consciousness. Some of them also hold that the notion of space-time supports their standpoint. In this four-dimensional space all events that–according to human experience–have taken place in the past, are happening now or will happen in the future, are of equal importance.

Among those who are of the opinion that time is a *subjective* quality is Kant. This is not very surprising, given his subjectivistic view on space that I discussed before. Along the same lines Kant argues that time is not an objective quality of the universe, but an priori form of human sensibility. Whereas our outer senses structure our sensations spatially, our inner sense gives these sensations a temporal nexus.

Heidegger follows Kant in the sense that he also holds that time does not exist independently of human beings and things. But Heidegger does not follow Kant's view that time is a sheer (*a priori*) form of human experience (cf. De Mul 2004, 88-96). *Dasein* not only is spatializing, but also temporalizing in that it discloses in its actions the three ecstasies of time. In this interpretation, time refers to *Dasein's* anticipating its possibilities (and for finite human beings this always means anticipating the final possibility: death). And the past is not a now-moment that has