

# From Visual Projections to Visionary Locations. The Symbolic Turn in the Era of Digital Imaging

---

Elize Bisanz

*I am a living vision. I see – consciousness – see my vision (seeing) – the conscious.*

Johann Gottlieb Fichte, *Die Bestimmung des Menschen* (1800)

*In the modern world, it has become difficult to have a soul. The modern human being, who is obsessed by himself, is captured in his body. He, who lives in an accelerated time and in fractured Space, has great difficulties to recognising his physiognomy...*

*The image has the immense power to absorb the fears and the passion of our soul and to destroy its meaning. The psychic life of the modern human being takes place between the somatic symptoms and the visualisation of his longings.*

Julia Kristeva, *Les nouvelles maladies de l'âme* (1993)

The recent developments in the field of neuroscience bear symptoms of a *symbolic turn* in its diagnostic and methodological logic. The use of semiotic categories, such as *representation* and *signification*, for the explication of complex neuronal phenomena, as well as for tracing the biological location of the self, imply a turn in the scientific strategy. Discussions distinguish between various modes of neural mappings signifying the self and uncover a shift in the proceedings of the body mapping language, from stationary locations to more fluent and continuous states of the self. In this process, the visual system operates as an interface and a translating centre between *seeing*, *perceiving*, *mapping* and *being*. Thus, the visual perception is at the same time the source that anchors the mental self in the biological location and the projection point for mapping the world in schemes of virtual environments.

With the example of the recent Mars Explorations and the role of the image processing techniques for building up new cultural locations, this paper discusses:

- the role of the visual perception for tracing our cultural self,
- the impacts of our self-locating strategies on scientific and technical development, and
- the impacts of technical development on mapping and inventing new qualities of locations.

## Culture, Vision, technical device

Since the late 1970s, when NASA's Viking Mission revealed a cold, dry planet, hostile to life, the idea of life on Mars has re-emerged. The question of where to look for signs of past or present life on Mars has been guided by the principle that all life as we know it requires liquid water. Consequently, when NASA launched two rovers named Opportunity and Spirit to Mars in 2003, it had a clear mission: to find information that could lead to signs testifying to the possibility of expanding our cultural boundaries from the earth to new locations on the planet Mars.

After the Christmas panic in 2003 over the failure to transmit images of Mars, we are receiving spectacular pictures from the European Space Agency's Mars Express mission, beamed back to Earth each day now. A close analysis of the 'camera' as the technical device and the following image-processing phenomena to construct the final image unveil the traces of our mental vision and its meaning production levels, as well as the structural shifts in our visual perception caused by the impacts of the technical development.

Are the beautiful images of the planet Mars a product of visual projections or are they virtual images, simulacra, invading our spirits and opening new opportunities for visionary locations?

The example of the Mars images reveals the fundamental function of image-signs for the perception of our environment. Moreover, these images exemplify the reciprocal influence of our visual perception and scientific development in expanding our cultural territories.

## Forming and reading cultural identity

Culture consists of codifications, a kind of social boundary without whose translation, which means interpretation, the human being remains trapped in his cultural net or, following the example of the body, trapped in his cultural body. Through interpretation we construct our identities, which are, to a certain extent, negative entities. The communication form, or the language that we usually use to get in touch with our world and with it produce our culture, is always a secondary language, hence, an artificial one. In this sense, our identities are modes of codification, a result of the dialectic between *us* – as the 'own' – and *them* – as the others.

The consciousness of boundaries is one of the dominant issues of cultural discourses; a recent example is the political attempts to define the European identity. There have been different categories mentioned that try to mark the boundaries of Europe, such as the definition of the European identity as Christian, non-oriental, non-American etc. In general, we observe a tendency to replace the loss of our belief in progress, which has dominated modern culture, with a consciousness of our cultural boundaries. Hence, interpreting culture is increasingly understood as interpreting the limits of culture and even of cultural limitations.

The semiotics of culture can contribute in many ways to an explanation of the boundaries of cultures as different forms of information codification, with specific *raster*, embodying the *biological* and the *mental* self, very similar to the immunological model of self formation.

This shows that the structure and the logic of a cultural body is based on polyphony. Consequently, there can exist no such thing as a homogenous culture. Culture as a sphere of permanent meaning production is a dynamic entity, a permanent change written *on* and *through* the human body as its territory.

Nevertheless, in the era of cultural globalisation and digitalisation, we experience new forms of identities, such as fragmented identities, which demand adequate forms of dealing with differences. Accordingly, our sensory dispositions, such as visual perception, are undergoing similar conversions to a more fragmented interpretation.

The polyphonic logic of cultural identities surpasses the dialectical and paradoxical logics of Modernism and post-Modernism; the changes reveal, respectively, changes of the notions of *history*, *binarism* and *biography*.

#### a – *history*

Inventing history is an accumulation of power on the basis of that history, which also means codifying new narratives. According to the western narration concepts, *historicity* is understood to be the guiding thread that allows us to think of the possibility of a history which brings together everything that concerns the universality of humankind.

A close look at contemporary cultural development shows that, in order to communicate in the globalised culture, just the contrary is expected. Today, to achieve a cosmopolitan approach to future democracies, we have paradoxically to free ourselves from the phenomena of dogmatism and authority which a language can produce.

b – *binarism*

Also *binarism*, which is a central structural aspect in the western history of thought, has to be overcome in order to open different access possibilities for and to different cultures. Culture can no longer be understood and produced by a program, an originary language whose memory it would suffice to recover so as to discover its destination. The logic of culture is abstractly cosmopolitan and universal. It does not have a sole memory; it is always hybrid, multi-linear and polyglot.

c – *biography*

Following the present discourses on the different theories of identity formations and cultural boundaries, we notice the very strong dominance of the traditional space models and, most of all, their dependence on a territorial anchorage. According to Jan Assmann, the consciousness of a social affiliation, that which we call a collective identity, relies on the participation in a mutual knowledge and a mutual memory, which is mediated through a mutual symbolic system (Assmann 2002).

Social identity is defined as the product of the intersection of common knowledge, of a common language and common memories. Hence, the politics of legitimising the individual stories is, at the same time, a politics of accepting the *other*, in the form of other voices, other versions and other possibilities of writing history. Thus, dealing with culture is, in its nature, dealing with differences and their translation in a communicable form. Translatability is the essence of culturality. Traversing natural to cultural status is already an act of translating mute nature to a cultural codification, and expressing nature in signs means, primarily, understanding and controlling nature.

The structure of a narration is built up on two axes: the *spatial* and the *temporal* dimensions. It is impossible to think of a narration without duration, and a narration without space or territorial legitimation is a pseudo-narration or a ghostly existence, a death mask.

Nevertheless, in the globalised and digitalised hyper-culture, we are experiencing new forms of narration structures. A common denominator of these codifications is the fragmented structure. The fragmentation occurs on both narration-axes: on the time axis we are experiencing an a-linearity and on the spatial axis we are proceeding towards more topological, simultaneously existing, abstract layers, whose juxtapositions operate as temporary carriers of cultural ex-

pressions: *we call them transitional objects* with polyphonic identities built through the simultaneous *utterance*, and made possible by cultural production.

Culture is a complex organised mechanism that stores information and records new information, codes and deciphers information, and translates them from one sign-system to another. At the same time, culture is a permanent struggle, the field of social conflicts, historical clashes and class struggles. (Lotman 1981: 26.)

Further diagnostic access to the cultural body can be achieved through analysing its *boundaries as the process of meaning production*. In the cultural semiotics of Yuri Lotman (1981) we find the notion of boundary to be one of the primary mechanisms of semiotic individuation, situated at the outer limit of a first-person form. Beyond the boundary begins the space of the other, which is understood as hostile and disorganised, whereas inside the boundary is the cultured space, which is safe and harmonious.

Every culture defines itself by dividing the world into 'its own' internal space and 'their' external space. The interpretation of this binary division depends on the typology of the culture. The boundary can have diverse characters; it can be a state frontier, or a social, national, confessional or other frontier.

The function of the boundary is to control, filter and adapt the external to the internal. This implies and represents the separation of 'one's own' from 'someone else's'; it filters the information that intrudes on the 'own' information-sphere and translates the new information into one's own language. More importantly, it expands its structuring process beyond the 'own', into the external space. As representation, the boundary embodies the domain of bilingualism practised by the inhabitants of borderlands between two cultural areas. Hence, the boundary exemplifies the binarism in the semiosphere.

Culture as a whole is understood as constant and heterogeneous meaning production. Nevertheless, it is neither anarchistic nor a schizophrenic destruction of the achieved, but rather a practice of structuring and de-structuring, a traversing of the social and cultural boundaries, and in this sense it is a revolutionary act (Kristeva 1984: 31). Julia Kristeva distinguishes between two main levels of meaning production: a *symbolic* and a *semiotic* level, as the subject producer of meaning is himself symbolic and semiotic.

Hence, the science of culture as the science of meaning production and consumption analyses the culturality, understood primarily as the poetic work of the cultural subject, as the free inventing power of our perception and phantasm. It

understands the production of meaning as the dialectical interaction between the symbolic and the semiotic.

The semiotic layer is the relationship between the significant and the signifier: *characteristic properties, traces, marks, evidence, indication, and arrangement*. All these are elements that form the structure of the meaning, e.g. they are fundamental dispositions of structuring energies that produce and shift meaning. The dialectic of meaning production through the relation of the individual to society is not represented on this level. Certain semiotic expressions are already transmitted in the biological code and the psychic memory. These are also natural dispositions for the symbolic function. The genetic dispositions concern the semiotic pattern; they determine the shifting and compression of the semiotic status in the process of sign production.

On the symbolic level, on the other hand, the expression form is directly in interference with the semantic and pragmatic levels. Hence, the individual utterance leads directly to semantic fields and to logical relations. The symbolic is therefore the social product, the relation to the other. It is produced through the identification of the subject with himself and his surroundings.

Considering all these levels we conclude that the pre-symbolic relations are also pre-sign and pre-syntactical levels. They converge in the body of the individual through the process of meaning production.

### Locating the self through images

Recent developments in the field of neuroscience show symptoms of a *symbolic turn* in scientific language, these using, above all, semiotic categories, such as *representation* and *signification*, for the explication of complex neuronal phenomena and for tracing the biological location of the self. In this context the discussions proceed, distinguishing various modes of neural mappings signifying the self, and uncover a shift in the proceedings of the body mapping language, from stationary locations to more fluent and continuous states of the self. In this process, the visual system operates as an interface or even as a translation centre between *seeing, perceiving, mapping* and *being*. Thus, the visual perception is, at the same time, the source that anchors the mental self in the biological location and the projection point for mapping the world in schemes of virtual environments.

The introductory quotations outline the field of the following thoughts, which reflect different scientific perspectives: semiotics, vision-science and astronomy,

especially their role in human scientific achievements, as well as their different strategies of inventing and possessing new forms of locations to dwell in and to spread power. All three quotations deal with the concept of the *self* and its relationship to the world, that is to the *being*.

What impact do our self-locating strategies have on scientific and technical development, and to what extent does technical development widen the parameters of our mapping fields, opening new horizons for new dimensions of transitional locations?

The scientific discourse of recent years on visual and neuronal activities is undergoing a certain shift in its diagnostic methods. It is becoming more and more obvious that the key to the neuronal operations of our brains lies in the cultural activity of the visual consciousness as the interface connecting our brains to the world. Here we observe that neuroscience is experiencing a *symbolic turn*. On the other hand, the discourse on defining culture and cultural identities shows that the most evident identifications of a culture and what cultures have in common primarily appear in categories of cultural boundaries, both physical (or biological) and mental (or perceptual).

These boundaries of the biological and the cultural disposition of human beings have always constituted one of the most fascinating research areas for both positions. In fact, this research field presents itself as a boundary that simultaneously implicates a mutual point on which both sides have realised the impossibility of explaining the *self* or the *body* without considering each other.

A very interesting example is revealed by the recent definitions of the 'concept of self' by the neurologist Antonio Damasio. In his book *Looking for Spinoza* (2003), he discusses different concepts of the 'self', such as:

- the self is what the immune system identifies as belonging to the body;
- the self is the sense of one's being;
- the self is the sum total of qualities that distinguish the mind of one person from that of another, or
- the self is One's personal identity.

In his definition of the self, Damasio distinguishes between an *immunological* self and a *mental* self, and proposes two approaches to explain the mental self: through an *introspective* and through a *biological* perspective. In this context, introspection tells us that the mental self is not a thing but a *process*, one that produces phenomena ranging from the very simple – the automatic sense that I exist

separately from other entities – to the very complex – my identity, complete with a variety of biographical details. Combining the results of introspection with a biological perspective, we get a general picture of the mental self as the representation of *individuality* and *continuity* of a living organism.

All these distinctions lead us to the location of the mental self. Damasio takes the neural mappings of our body as the neural basis of the self-involving process, the body being at the same time the ‘thing process’ that is symbolised as the mental self. Two characteristics of the body support its essential role: its relative invariance and the fact that the brain’s representation of the structure and operations of the body is continuous.

The body itself is understood to be the source of the sense of continuous being that anchors the mental self.

As we observe our environment, many neural stations of our visual system, from the retina to the cerebral cortex, shift rapidly from making various neural *mappings* of the things surrounding us. In quick succession, the same visual brain regions construct entirely *different neural maps* by virtue of the different sensory inputs that we gather, resulting in different mental images. However, while our visual brain changes obligingly, several regions in our ‘body-sensing’ brain, which has the function of mapping varied aspects of our body, do not change at all, in terms of the kind of object that they represent. The body remains the object of the body-sensing brain.

The different kinds of body image that have been considered, from the flesh and from special sensory probes, can be manipulated in our minds and used to represent spatial and temporal relations among objects. This allows us to represent events involving those objects. Thanks to our creative imagination, we can invent additional images to symbolise objects and events and to *represent abstractions*. For example, we can fragment the foundational images of the body we discussed earlier, and recombine the parts. Any object and event can be symbolised by some kind of invented, imaginable sign, such as a number or a form, and such signs can be combined in equations and images. The invented, imaginable signs can represent abstract entities just as well as concrete ones.

Starting with the aspect of the immunological character, which can also be interpreted as a coding of the world, the terminology of the neuroscientific explanations shows genuine semiotic categories that are mostly based on the interpretation of meaning production through locating the self.



## Shifting locations through images

Having all these theoretical constructions as a device to determine the location of the self – or even as a transition from one location to another – we try to analyse such images, which are produced as an interface between our self and imaginary locations, as embodied meanings. Taking the recent images of the Mars exploration, we pose the questions: which characteristic sign-level do the Mars images have? To what extent are they images of real locations?

One of the main characteristics of the Mars pictures is that they are simulated pictures taken in tele-presence: the Mars images are virtual images. In optics, 'virtual' stands for what is inside the mirror, as a projected image and beyond reach, whereas 'real' stands for what is outside and shares our three-dimensional bodily space. Virtuality of images is very often connected with a digital image production device. Also, in this case, we have a projection plane, a boundary that separates two spaces: the *corporeal* and the *representational*.

If we look at the surface of the mirror as we look at the surface of the screen, we notice that, as opposed to the *specular* image, the *digital* image is formed on the screen through cathode rays actually projected from within. The digital image on the screen does not require external illumination, as does the mirror, to form its image; instead, it projects light on us, i.e. it invades our corporeal reality. Virtual reality blends the ideas of tangible corporeality, which is called the *real*, and intangible representation, which is understood as the *virtual*. Hence, to experience virtual reality one has to be within the virtual image.

A further characteristic of virtual images is simulation. On the sign-level, simulated images have no models which they represent; there is no dialectical space between the image as a representation and the meaning or message, between the visible and the intelligible.

A representation starts from the principle that the sign and the real are equivalent. Conversely, simulation starts from the utopia of this principle of equivalence, from the radical negation of the sign as value. The relationship between the image and reality has, hence, undergone several changes: from the simple reflection of reality, to its perversion, to masking the absence of the reality, and finally, in its digital form, to being a pure simulacrum with no specific relation to any reality (Baudrillard 1993: 194).

These transformations of the inner sign relations show their impacts on the general development of the visual expression forms and a shift in their logical

construction. In this sense, we can distinguish between three kinds of logic of images, according to their historical development: a *formal* logic of the image, a *dialectical* logic of the image and a *paradoxical* logic of the image. All of them distinguish themselves through their different attitudes towards the time aspect. In the formal logic of the image, the flow of time does not play a role. This is the traditional pictorial representation, with the composition of the figure as its central point, the dialectical logic of photography and of cinematography in the nineteenth century, when the image corresponds to an event in the past, that is to a differentiated time. Finally, the end of the twentieth century, with video, computers and satellites, is defined as the age of the paradoxical logic, when images are created in real time. This new kind of image gives priority to *speed* over *space*, to the virtual over the real, and, therefore, transforms our notion of reality from something *given* to a *construction*.

Hence, simulation is no longer that of a territory, of a referential being or a substance. It is the generation by models of a real without origin or reality: a hyper-real. Here, the territory of the representation no longer precedes the map; on the contrary, it is the map that precedes the territory (Baudrillard 1993). We can even go further and claim that it is no longer even a question of either maps or territory, that these categories of spatial organisation undergo altered physical laws. The reflective and identifying distance between the territory and its scheme contracts and, with the disappearance of this poetic spatiality, we are left with a blurred vision of *coexistence*.

The representational image disappears with simulation, whose operation is *nuclear* and *genetic*, and no longer *specular* and *discursive*.

In this passage to a spaceless sign structure, in the age of simulation, referentiality loses its static character. Instead, materiality is substituted for meaning, which henceforth is organised in systems of signs, where all systems of equivalence, all binary oppositions and all combinatory algebra have the potentiality of use. Contrary to the real, which is produced from miniaturised units and memory segments, the hyper-real no longer has to be rational, since it is no longer measured against some ideal or negative instance. It exists only in the operational experience.

Imitation and re-duplication, as central categories of a rational construction of our vision, lose their efficiency as operational levels in the construction of the hyper-real. With its defunctionalisation, the Cartesian vision loses one of its fundamental schemes.

Interestingly, this deconstruction of the Cartesian world-order is interpreted as a cultural irritation caused by the disconnection between the corporeal and mental self, as never again will the real have to be produced, according to the rules of our visionary thought, as the reflection of the self. The hyper-real *seeing* is, according to Baudrillard, detached from the realm of the imaginary, and from any distinction between the real and the imaginary. Its space is the territory of the orbital recurrence of models and the simulated generation of difference (Baudrillard 1993). Despite these changes, we have to pose the question as to whether the altered sign structure has negative impact on our cultural competence, where we have no visions and accordingly no visionary horizons.

### **Tele-presence and the fusion of the subjective and objective territories**

A further structural change of the visual communication is supported by tele-presence, primarily understood as a device of the restructuring of the vectoriality of the communication process. The dichotomy of sender/receiver is, in tele-presence, no longer enough to account for the multi-modal and multi-directional nature of a networked, collaborative, interactive communication. The images are not sent but rather transmitted, without 'senders' attempting to convey particular meanings to 'receivers'. Tele-presence is not a dialogic experience, but rather an individualised bi-directional one.

The essential impacts of this state on the development of our visionary capacities lead to the splitting of the logical boundary between time and space categories. In tele-presence, time becomes absolutely real and distance disappears. The shortest distance between two points is no longer a straight line, as it was in the age of dialogical time, but simply real time. These structural changes lead to changes in social structures. The ability to communicate information instantaneously, to send and receive sound and images immediately, accounts for the decreasing social relevance of the extensity of space in regard to the intensity of time. As a consequence, speed is no longer expressed only in miles or kilometres per hour, but also in bytes per second.

What seems to be at the core of this change is the fact that real space and the very notion of distance are, in tele-presence, irrelevant, giving up their privileged status to real time and to the communicating of images. The real time transmissions of video images over great distances produce a new kind of place, a 'tele-

topographic' location (Virilio 1996). With this technical change, locations begin to lose the gravity of a territorial boundary. Moreover, by crossing the boundary and the elimination of the distance between the two *topoi*, of the 'own' and of the other that has to be transmitted, the classical notion of the boundaries becomes obsolete. This change in the strategy of the communication act is consequently supported by the qualitative changes of the constitutional elements of a location. The location in tele-presence consists of images of which the notion of real time is the essential expression. The result is a tele-reality that supersedes, in real time, the real space of objects and sites. In other words, we now see the continuity of real time overcoming the contiguity of real space. The media of transmission, monitors and video cameras are not only devices for transmitting the information data but also a sort of prosthesis substituting for the biological eye as the sensory interface receiving the information impulses of the imaged location.

A wide range of changes is emerging in our cultural reality.

The impact of the new media on our vision and on our surroundings is proving to be enormous: 'In order to see,' Virilio observes, '...we will no longer be satisfied with dissipating the night, the exterior darkness. We will also dissipate time lapses and distances, the exterior itself.' (Virilio 1996: 128.) The cultural experience of a shared public space is, in tele-presence, primarily dominated by the perception of informational territories; where it can be experienced in *real body*, instead it is transmitted by the public image. The meaning of perception becomes more obvious in the piercing gaze of scientific imagery and in satellite surveillance, which can, potentially, instantaneously map the body of the *self* or of the territory of the *other*. Hence, the strategy of vision follows an *immunological* strategy, which includes a mapping of the territory in distance through a synthetic vision. Images of tele-presence are not images in the traditional sense of representation, but images of light that are part of the 'seen' or 'scanned' territory. Moreover, they are images built on information bits not seen by the naked eye, but calculated by the informational equations.

Discussing the new cultural and aesthetic conditions of a society that increasingly manipulate more information than objects, Abraham A. Moles states that the human spirit is now having to adjust to this new situation in which images and reality become more and more identified with one another. 'As we enter the age of tele-presence,' writes Moles, 'we seek to establish equivalence between "actual presence" and "vicarial presence".' (Moles 1992: 28.)

This vicarial presence is destroying the organising principle upon which our society has, until now, been constructed. The resulting equidistance that we share is felt as a media phenomenon because of the process of intermediation of real space promoted by a real-time telecommunication apparatus. Like Baudrillard, Moles too reflects the negative impacts of the technical developments on our social consciousness.

An analysis of these changes in the visual consciousness caused by the new media of cultural production also reveals changes in the scientific logic, which implies reciprocal impacts of the scientific and the social development. The origin of this constant interaction is our symbolic consciousness. A product of the symbolic activity of the mental self – a co-activity of the genetic and the specular gaze – is the use of images as scientific documents of possible territories. The recent examples of scientific use of digital images unfold a meta-structural meaning production layer that reconstructs the digital information of the post-Cartesian cultural production. The mere fact that images are applied as constructed representations of territories implies a fundamental re-evaluation of the visual self.

### **Conquering new territories as a semiotic work**

The processed images of the planet Mars show the strong interaction between images and the construction of realities. The process of imaging is at the same time a process of conquering realities, or 'real' territories, interestingly, not through our visual sense but through our mental vision, which combines data-processing abilities with visionary simulacra. What gives these images their legitimacy to represent the territorial power?

On a simple technical level, the pictures are the product of the High Resolution Stereo Camera (HRSC).<sup>1</sup> Like a normal camera, the HRSC captures data through a single lens, which is pointed at the planet's surface each time Mars Express' elliptical orbit reaches its lowest altitude, about 250 kilometres. Behind the lens, however, is a complex system of parallel sensors, which are sensitive to red, green, blue and near-infrared light. By shooting points on the planet's surface from three different perspectives – forwards, downwards and backwards – the camera collects information that is then processed back on Earth to create a *digital model* of the terrain. Later, digital processing helps to create three-dimensional

---

<sup>1</sup> See <http://berlinadmin.dlr.de/Missions/express/kamera/kameraeng.shtml>.

views, giving the different shade values different colours, composing the images that are broadcast globally as the images of the planet Mars.

The authors of the images, in this case the instrument builders, define the images as 'real' pictures. A closer analysis of this claim of the *reality*, of the *rightness* or *correctness*, of the digital Mars-images decodes their structural composition and reveals a shift in the sign quality of the HRSC images compared to the mechanical photographic images. Hence, we observe a discrepancy between the inner structure of the Mars image-signals and the images of Mars which the scientists confirm to be 'real'.

Using the qualifying terms of correct, real or wrong, we imply the existence of a certain object or quality as a starting point in the determination of the image. But, what are these criteria whose reference we call Mars images? If the imaging process is not a simple capture of the existing planet, but a processing of the transmitted data, which have no image quality, how can we determine the object of representation? What are the constitutive characteristics of the represented object?

As is well known, images in their simple definition as pictures have generally iconic characteristics. Especially in their scientific use as documents, they are representations of certain objects to demonstrate similarities and certain qualities of the object. In this sense we can call an image 'real', namely, a correct pictorial reproduction, an iconic sign-vehicle of the object. The information transmitted by the image has to be identical to the information that exists in the object. There is no doubt that the main aim of the various scientific perspectives engaged in the Mars exploration is to find signs of life on the planet, understood as signs of environments, of locations of cultural development. The question is, where do the processed images get their legitimacy as documents of the existence of the Martian location?

For these purposes, science has to trace the elements on the semiotic level: it characterises the rocks, soils and minerals, determines their distribution and composition, determines what geologic processes have shaped them and influenced their chemistry, and identifies and quantifies relative amounts of specific mineral types that contain water or were formed in water.

The Elements on the semiotic level are the signals, the data that the technical device, which is the camera, captures on the surface of Mars. The sign-character of the signals which are transmitted by the camera shows, only on the light qual-

ity level, a certain iconicity. This is represented by the bits that are the transformation of the light signals to quality information.

The Mars images do not have an iconic level; hence, they are not representations as captured images, nor do they mediate a given object. Also, on the technical information level, we have merely Cartesian lines of pixels specifying the intensity of each cell by means of an integer number taken from a limited range. Furthermore, all this information tells us nothing about the shape and the physiognomy of the Martian location.

On this elementary semiotic level we find fundamental differences between 'real' images as iconic signs and the mathematical constructed images of the HRSC. This means that, very different from mechanical photography, the digital information from Mars reveals no representational qualities, no identifiable physiognomic qualities of the Martian surface. As simulated image-information transmitted in tele-presence, they are images of light that are not taken by 'seeing' but through the process of 'scanning'. Nevertheless, the scanned information is still far from the final image of Mars, which is completed after the transmitting, processing and approximating of the data. In this image production process, we need at least two schemata of image-sign production: a scheme for the camera device to collect light information and a scheme for translating the electronic information into pictorial categories optimised to be read by our visual perception apparatus. During the whole process of image-construction, we do not have any image-element that we could call 'similar' to the surface of Mars, which implies that there is no iconicity in the Mars images. Also the second scheme of information-translation gives us no hints of iconicity; hence, it is an artificial coding system, programmed for specific coding-functions of the scanned information. Nevertheless, we read the Mars images not only as pictures of a planet but also as pictures of a planet with specific geological qualities.

The iconic truth of the processed images of Mars lies in our mental vision, which can be compared with the mental self. Hence, the images undergo an introspective process: *mapping* followed by *processing*, *seeing* and *being*. Whereas the piercing gaze of the camera device transmits semiotic elements, it is on the following *symbolic level* of the discursive gaze where the images attain their symbolic identity of being images of Mars. As symbolic signs – the symbolic dimension appears whenever recourse to a code or rule of interpretation is required in order

to understand – they represent both the processing of the numerical data and the process of their transformation to a visual category, the image being at the same time the ‘thing process’ that is symbolised by the mental vision.

The Mars images exist in our brain in mental vision prior to the imaged traces of its substance. The semiotic elements of these images are pre-visionary: as the digital information emerges introspectively into our inner vision, it is converted to images not representing the planet Mars but representing the visionary projections of our mental self. Once the visionary simulacra are established in the cultural context as images of Mars, they could also be read as iconic signs, not necessarily of Mars but of the processed information about the planet in our brains. Undoubtedly, the production of meaning through the designed Mars images is a product of the dialectical interdependence between the symbolic and the semiotic layers of the image-signs; they surpass the paradoxical logic of the digital images by virtue of our symbolising activity.

In this manner, the whole cosmos, with all its unimaginable dimensions, finds its place in our little skulls.

## References

- Assmann, Jan 2002. *Das kulturelle Gedächtnis: Schrift, Erinnerung und politische Identität in frühen Hochkulturen*. München: Beck
- Baudrillard, Jean 1993. The evil demon of images and The precession of simulacra. – *Postmodernism: A Reader*. Ed. Thomas Docherty. New York: Columbia University Press, pp. 194–199
- Damasio, Antonio 2003. *Looking for Spinoza: Joy, Sorrow and the Feeling Brain*. Orlando: Harcourt
- Fichte, Johann Gottlieb 1779. *Die Bestimmung des Menschen*. Hamburg: Felix Meiner
- Kristeva, Julia 1984. *Revolution in Poetic Language*. Trans. Margaret Waller. New York: Columbia University Press
- Kristeva, Julia 1997. *Les nouvelles maladies de l'âme*. Paris: Fayard
- Lotman, Juri M. 1981. *Kunst als Sprache. Untersuchungen zum Zeichencharakter von Literatur und Kunst*. Leipzig: Reclam
- Moles, Abraham A. 1992. *L'image, communication fonctionnelle*. Tournai: Casterman
- Virilio, Paul 1996. *The Vision Machine*. Bloomington: Indiana University Press; London: British Film Institute