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IMAGES OF THE BODY IN THE HOUSE OF ILLUSION

The world is an illusion -
and art a representation of the world of illusion.
Paul Virilio

Making the invisible visible

"What is important is what you can't see", stated Saint-Exupéry's Little Prince (1). "Making the invisible visible" in order to research what is important. This is how we describe virtual reality in 1991. Moreover: "Compacting the diversity of the world into a single unit - the binding power of the idea and the fundamental picture" (2). ART + COM conducts "research and design in extended dimensions" and sees itself as an "enterprise that endeavours to create a 'total art, science and technology work' which is devoid of boundaries and based on a common 'digital code". Designers, artists, computer experts, scientists and specialists from the humanities are looking to pool their resources in order to comprehend the digital world effectively.

The speed at which information is conveyed and the quantities involved can be overwhelming for the individual. Can the arts work with science and technology to counteract this feeling of disorientation? We begin to examine light, acoustics, time, space, movement and perception through the capabilities of the computer, investigating these from the aspect of architecture, art, physics, computer graphics, video and design. The concept of 'invisibility' is one that is shared by each of the disciplines concerned. The financial basis for founding ART + COM (1988) as an independent research institute under the leadership of Edouard Bannwart has been created by the three large-scale projects "New media in urban planning" (3), "Design of comfort factors in (digital) space: investigations into light, air and acoustic space" (4) and "Visualisation of digital medical data" (5) which have been funded by Deutsche Telekom / Berkcom and the Senate for Science and Research.

On the track of our lost senses

New virtual communication space need new techniques of illusion.
When we reduce our multisensory abilities on a certain sense the virtual communication becomes another dimension. The Telephone is so much accepted because the connected people concentrate on each other by only one sense - the sense of hearing.

Virtual Communication Space and Immersive Illusionary Techniques in which the body is confronted with new experience are main areas of our interest. We overlay real and virtual worlds to create acoustic spaces, talking walls, echoes and acoustic distortions. We endeavour to find digital correspondences for light and air images such as reflections, movement, light diffraction and the dynamic incidence of light in its changing forms. Our study of reality and virtual reality is concentrated around the senses and their deception. While the idea of constant metamorphosis, symbolised by Hermes (6), and the concept of identity - which is also an important theme in the myth of Narcissus (7) - are other key areas of interest. It is our goal to bring persons "into contact" with the world, with each other and with themselves. We are therefore on the track of man's lost senses in a bid to restore these with the aid of technology.

ART + COM changes its goals in 1992. Greater emphasis is attached to software development. The change from Berlin to Bonn is therefore more difficult for us than the move to the "GMD Research Centre for Information Technology" where Wolfgang Krüger is in charge of establishing a Department of Scientific Visualisation. He wishes to incorporate the artistic and scientific aspect that he has come to know through joint work in Berlin. As Fellows of the Academy of Media Art (KMH) in Cologne we are invited to work on our own projects. The base for this interdisciplinary work changes following Wolfgang Krüger's departure from GMD (1994) and his early death (1995). A physicist highly respected in the world of computer graphics, a friend with a keen interest in art, and a counsellor always ready to encourage and inspire others -

such a person will always be sorely missed, but even more so in a technology-driven and industry-oriented environment such as the GMD Research Centre with its some 1000 employees.

Nevertheless, award winning works were created over the years 1992 to 1997 in the fields of "man-machine communication", "unsharp interface" and "interactive storytelling" and included "Responsive Workbench", "Liquid Views", "Rigid Waves", "Spatial Navigator" and "Skywriter". Productions such as "Video Only - Virtual Performance" or the award-winning Cyberstar (8) concept "Paramatrix" are applauded by experts worldwide. There is considerable international interest in these projects from the worlds of art, science and technology. In addition to art-oriented works dealing with identity and perception, new forms of communication are also examined in other research projects. There are plans to establish an independent area for "Media Art Research Studies - MARS" in the Institute for Media Communication newly founded at the GMD. This is essential, however, to ensure continuous cooperation between art and science. Otherwise, work will tend to concentrate solely on the development of a "common language" on a project-specific basis. An interactive installation researching new ways of communication can never be left to the individual. The production team can be compared with a large-scale team of architecture working on a competition project.

Interactive artistic work is a synthesis of theory, technology, design and play. Future work, learning, teaching and playing - the influence of digital technology on the image - the power of virtual reality - changing perceptions - sight and movement - the dynamic perspective - the dissolution of space. All these are areas that we keep coming back to, implementing them in architecture, art, dance and theatre. We have approached the task as artists and architects. Working closely with digital media and computer scientists we are turning into researchers and inventors. We see it as our job to bring poetry into media art and to address the visitor's senses. We are turning the theory on its head that man is losing his body to technology. In our opinion, the interactive media are supporting the multisensory mechanisms of the body and are thus extending man's space for play and action.

The space as stage setting - a game with reality

Our work is based on recounting a story in space. It is unimportant in this regard whether the story is recognised. The only thing of importance is that the visitor finds a thread that stirs memories inside him. Three elements determine the structure - the spectator, the story and the space. The area of conflict is the relationship that exists between man and his world of experience. The immersion into a story which is presented virtually and interactively as a framework for human actions has a fundamentally different purpose than film or theatre. The basic form of the theatre is dialogue and contemplation of the various ways of thinking and behaving. Film is the modern form of dramatic art and represents a progression from the static image to the moving one. Interactive media art has the task of bringing the qualities of the theatre and film into confrontation and of intermeshing these qualities. The audience is given an unusual responsibility in this regard. They play a role in the story. And have to develop this role themselves in this game of illusion.

But what becomes of man in this staged world? How can he become part of it? What form of dialogue will he develop through interactive digital communication? How is the virtual space shaped by human intervention and what stories are told by man and space? We invite dancers to take up the new virtual play models. It is not just that the scenarios that are virtual, the settings themselves also change. Reacting stage backdrops and corresponding sounds generated by body movements give rise to crazy body gestures and choreographies. The unusual arrangement of audience and performers in space creates a state of confusion and uncertainty (9).

Commercial television productions such as magazine programmes or reviews of the year are performed in GMD's Virtual Studio by a number of German broadcast stations. Technical further developments match the Virtual Studio software to the practical needs of the market. At the same time, the European Commission is also promoting technical development as part of the ACTS programme. Unfortunately, however, there is no funding for developing flexible software

geared to the needs of audience and performers. There is almost no support for the design and construction of virtual scenarios or for drama productions with their costly rehearsals. The broadcast covering the award of the 1995 Video Art Prize (10) can therefore only be realised through a technically oriented GMD research project (Distributed Video Production). For the first time ever, the Virtual Studio at GMD therefore undertakes a collaboration between dance and stage which takes place at two different locations. The virtual sets are transmitted live from Bonn via a ATM broadband to the studio stage in Baden-Baden.

Few Virtual Studio productions can lay claim to an image language that is adequate for the medium. In most cases, the individual image layers are not interwoven and presenters react dispassionately in the empty blue room. If they are indeed able to react to their visual environment and disappear through virtual doors, then they only succeed in doing so when working with a highly specialised team. The presenter is merely a puppet in this game. Be that as it may, the empty room is the interesting aspect in this scenario. To ensure that the actors do not get lost in this blue room, they must commit the scene to memory. They must really act and not just go through the motions. The emptiness is a challenge to their imagination, to a spatial mode of thinking and to reaffirming the body's gestures in space.

On 19 November 1995, some 150 invited guests in the Baden-Baden studio find themselves in front of and actually inside the virtual sets transmitted along data lines the some 350 km from Bonn to the SüdWestFunk (SWF) studio. Two cameras, numerous actors and the audience are in blue box of the SWF TV studio, though the virtual sets themselves are actually in GMD's digital studio. The broadband network of Deutsche Telekom is used to transmit the camera shots of the actors to Bonn where they are inserted into the virtual sets and, without any noticeable delay, are retransmitted to Baden-Baden. For the first time ever, a blue box is used live as a stage. Eight virtual stage sets with their metamorphic build are used to give structure to the chronological sequence of events. The audience in the studio sees the actors in the virtual sets on the wall-high projection area - the "apparent" image that will be used later for the TV transmission - while the presenter and dancers live in the studio perform against the empty blue stage. As in the theatre, the performers appear from backstage. But here the voices appear from behind the audience's backs. The presenter appears in the image on the video wall. The scene of the action changes and also takes in the space occupied by the audience. The dancers leave the real stage through the audience area and apparently disappear in the video wall. The studio guests' attention is pulled to and fro. Part of the dramatic effect of the transmission is created by the fact that the audience are seated in swivel chairs, and thus create a similar picture to the movements of spectators on a tennis court. The game with reality remains the most important theme when working with virtual sets.

"Cyber City", let your finger do the walking

"Berlin - Cyber City" (11) or How do I step into the virtual city? This study is the first of its kind to examine audience anticipation and the use of interactive systems in public spaces. The fall of the Berlin Wall provided the impetus in 1989 for us to take a closer look at our city. The reconstruction of the former capital now reinstated presents a major challenge in urban planning and one for which no-one is prepared. We are interested in making the various plans accessible to the public as a virtual reality game. But how can we convey the complexity of urban planning to a large audience?

The entrance to the "Cyber City" is an aerial shot of Berlin which is secured to a table and forms the reference level of the real city. We play the "let your finger do the walking" game and use an electronic thimble (Polhemus) to move around, show and visualise. The thimble is a sensory mechanism that conveys its positional data on an ongoing basis to the position detector secured underneath the table. The real location on the aerial photograph can thus be coordinated precisely in the computer with the 3D simulation of the city architecture. The visitor gains both an overview and an insight into the situation. The wall-high projection screen behind the table allows the visitors to follow their virtual trip through the "Tiergarten", past the Congress Hall (now the House of Culture) and the Reichstag. "And this is where we ought to be able to take a stroll through the Brandenburg Gate," calls out an enthusiastic East Berliner and is

amazed when he finds he really can "drive through it, turn around and can then even fly back over it".

The table is a metaphor for language and encounter which actually functions. At the international radio and television exhibition in Berlin in 1991 visitors are not discussing the new VR technology but rather what had happened in 1989 when the Wall fell. The virtual table turns urban planning into a discussion of the city that incorporates both past and future. The "Cyber City" can be compared in form with a video sculpture. Set up in a public space it consists of the two elements - a table and a video wall. There are only two main perceptual surfaces: the horizontal (the table with the overview plan that corresponds to the lie of the city) and the vertical (the large video wall which embodies the city facade). The observer becomes a stroller through a virtual film set.

Home of the Brain - the computer's memory

While the observer is only the onlooker, this "looking" is a kind of movement. It embodies "active observation". From a certain moment when the observer becomes immersed in the action, his "passive onlooking" is replaced by "active observation". The observer discovers that he - and not the artist - is the one creating the situation. When the situation changes and the observer becomes a player, he suddenly begins to identify himself with the situation. Observation becomes more than merely consumption. In this moment consumption ceases. This is all the more true in interactive scenarios when the observer participates in the game and can intervene in it. In 1990 we endeavour to construct Alice's Wonderland. With virtual reality goggles and gloves, the body is exposed to new spatial experiences. The body is the interface between the interior and the exterior, between reality and virtual reality. "Home of the Brain" (12) - depicted as a metaphor for the computer's memory - is awarded the Golden Nica of Ars Electronica in 1992. The work is a vision of the future of telecommunications. Four years later it will be possible to work with a similar version on the Internet. The Internet is already being used as a public forum, as a venue for the virtual representation of masks, avatars and agents (intelligent advisers). This vision was still Utopia back in 1992.

"Home of the Brain" is a three-dimensional mandala. Every visitor can move around in this virtual environment using the virtual reality glove and finger gestures. The performer's gestures will become immediately visible to himself and his audience through the representation of his hand. The entire production can be observed on monitors or a large video screen. The performer functions like a kind of shadow artist in the virtual space behind the screen. "The virtual hand discloses its true soul to us," explains neurologist Hinderk Emrich commenting on the virtual flight and lively movements of a physically handicapped participant in Geneva whom we are watching via ISDN lines from Berlin. Below the head mounted display he cannot see anything of the outside world and instead sees himself as an integral part of the new virtual world which surrounds him. For a short time he feels himself free of his real body. During the virtual flight he sets his own agenda and develops his own personal perspective of sound, since the objects are interactively associated with sounds, noises and fragments of text.

The "Home of the Brain" is inhabited in virtual terms by pioneers in media development. The thoughts of Vilém Flusser, Paul Virilio, Joseph Weizenbaum and Marvin Minsky are implemented in the computer's memory. "Do we need that? Why do we need it?". Weizenbaum's warnings against the power of the computer and the impotence of reason wrap themselves around his "House of Hope" on Moebius-like chains of thought. In Virilio's "House of Disaster", the "racing standstill" is tested under trees falling as if in slow motion. Flusser's "House of Adventure" shows his vision of flowing space: "I dream of a house with walls that can be changed at any time, of a world whose structure is no more than an expression of my ideas". In Minsky's "House of Utopia", a crystalline transformation object, future computer generations are discussed "which are so intelligent that we can be pleased if they keep us as pets". The "Home of the Brain" has anticipated paradigms that today are at the very heart of discussions relating to media communication. They include the organisation of information in virtual space, telepresence, information linking and interaction with objects in virtual space.

The Responsive Workbench - a reactive environment

Man is a mover. If man does not move, he is dead. We have learnt to move our "head" alone. The rest has to remain still. Our society has long since run up against a brick wall, since everything in our head is also turning. Be that as it may, we do not want to remain stuck in old systems. Do we really have to sit still at our work? We want to use our hands. We want to draw, build models and not just be keyboard operators. We want to see these models through the virtual camera. We want to let our eye take flight and spring across the wall of reality. Instead of drafting plans we want to produce 25 frames per second. Film language is exerting an influence on architecture. We are developing a photographic pattern of thinking.



Fig.1. people operating the Responsive Workbench

In 1994 we design the "Responsive Workbench" (13) as a virtual work desk. The rigid arrangement of computer monitor and keyboard is to be replaced by a real training situation in which architects, engineers, medical staff and scientists can check and change their work in a simulated environment. The "Responsive Workbench" is a further development of the "table" metaphor used in the "Cyber City" project. Real-life situations and activities have been examined as to whether they can be transferred to virtual reality. The haptic checks with activities such as sketching, drawing, writing and painting are performed intuitively when we work with our hands. Kant calls the hand "man's external brain". The gestures of the hands and the gestures of speech control events on this reactive workbench. The person's own sight and body movements are connected to sensors that open up a dynamic perspective. The machine understands and reads our wishes for every possible observer standpoint and does so immediately from the eyes.

Sensor-controlled stereo goggles makes the objects under the interactive glass projection table appear as transparent holographs. Virtual houses can be designed and changed with a data glove. Every angle of vision, each one of my body movements is recalculated in real time as a function of the virtual object. In medical simulations, the beating heart of a virtual patient can be lifted out, removed and examined from every angle. A self-learning speech recognition system reacts to specific commands in order to keep the hands free for other operations. The user interacts with the virtual scenario, displacing, changing and manipulating it in order to test it for realism. He can also retrieve information from the computer which works invisibly in the background. The objects and activities themselves become the inputs and outputs for this environment. These is no longer a clearly perceivable interface between the user and the system.

Virtual reality and interactivity as medium - the dissolution of space

Painting, photography and television traditionally assume a static observer who, since the development of the frontal perspective in the Renaissance, has symbolised a distanced, quasi-objective approach. The technologies of virtual reality, on the other hand, anticipates a moving observer who himself is IN the image. Dynamism and constant change are the key features of interactive media, the illusion also encompassing the observer. His movement and location in space determine perspectives and the way of seeing things. He is IN the illusion. Linear spaces

with static perspectives and fixed observer standpoints are thus history. Images are becoming virtual spaces unhindered by boundaries. The space is no longer a place, but rather a means.

In physical terms, the observer was always an outsider in the fictive worlds of cinema and television. His involvement in the course of events, in the fiction, called for emotional intelligence, identification and catharsis on the part of the fixed observer who was firmly planted in his seat. With interactive simulation techniques, on the other hand, it is not the mobility of the eye alone that is demanded but of the whole body. From these aspects, the technologies of virtual reality can be linked with other illusion technologies such as panoramas, relief cinema and stereoscopic photography which also enable the eye to move around at will. As with panoramas from the 19th century (14), interactive media allow us to develop new dramatic forms of storytelling. The dynamic approach of VR systems is replacing the static perspective of the Renaissance.

In the interactive VR environment, the image space is losing its fixed boundaries. At the same time, while the body's sensation is reinforced, a new feeling for spatial orientation needs to be developed. Identifying the position of the eyes, head and body - like the identification of gestures and speech - has the purpose of harnessing the human senses for directly controlling communication. Man must not be asked to change his body and senses to match the machine. Instead, the machine must be tuned to man's needs. To a far greater extent than with traditional media, the VR media interface serves as a key to the media work and thus determines both the dimension of interaction and the dimension of perception.

Skywriter - navigation through body balance

Like Hermes the celestial messenger, the observer navigates as a "Skywriter" (15) using "virtual balance" and the metamorphosis of digital landscapes. To do this, he uses neither mouse, joystick or data glove. He simply has to move his body's centre of gravity accordingly to allow him to fly upwards or downwards, to the right or to the left. Unlike a joystick or mouse which reduces man to minimal reflex actions, "Virtual Balance" (16) requires the coordinated use of the entire body and its perception. Neither time optimisation nor disjointed gestures are required, but rather an interplay of the senses. Apparently without effort, the "Skywriter" is able to fly through virtual landscapes. Linear storytelling is translated into interactive action and transformed into virtual space-time. The dramatic effect of the action is governed by the person's relationship to his own body. Here, too, we observe physically handicapped persons who are motivated in their movements. The ground below their feet becomes an interactive surface and the body's perceptual sensitivity coupled with body balance become a control instrument.



Fig.2. The Virtual Balance – magic carpet navigation through virtual environments

"Virtual Balance" is a navigational system for controlling images through the use of the body. It is also a platform for observing the effect of images on the body. In the "Telepolis" 1995 exhibition in Luxembourg, Luxembourg's Grand Duchess accompanies her tour through the virtual city of Xanten with real-life jumps and reinforced body movements. During the presentation at CeBit

'96 in Hanover, neurologist Hinderk Emrich finds himself repeatedly in dance situations and discovers there an "enthraling" perspective of the virtual world.

"Virtual Balance" was developed in 1995. It consists of a platform with 3 weight sensors and is controlled solely by the changes in the position of the human body's centre of gravity. Movements and gestures, the body and the entire perceptual apparatus become the interface. The observer's positional information is passed to the graphical system for the purpose of calculating the current image and the required information. Depending on the level of detail of the virtual model, which is calculated from the distance to the virtual objects, different information content is made available to the observer.

This first application is part of a global navigational concept that can be accessed via the Internet or as a permanent installation on site. The "Skywriter" will then fly through virtual continents, eavesdrop on the sounds of the various cultures, or discover the symbol sets of the different peoples. The "Global Passage" around the virtual world is intended to visualise cultural identity and convey this between different cultures. In the longer term, it will be possible to control this virtual world tour using two synchronous interfaces. The navigator will then be accompanied by a second "Skywriter". The coordinated movement of the two navigators is then used to control a shared virtual trip. The multimedia navigational environment is ideally suited for public spaces, banks, department stores and museums in order to be able to make contact with other cultures when travelling to another world or a different location. "Virtual Balance" is envisaged as an interface for navigating in the three dimensional net space, for surfing the Internet, for children, players and performers.

The playable instrument or the sense of the senses

A number of questions need to be answered when working with (interactive) media art. How can I create the instrument for playing with? How can I produce a work that is to be grasped through the senses alone, without any need for spoken language or written instructions? How can I make the observer understand what he can do? The observer should feel "it", that spiritual element of the work that is communicated through his body! What senses should be addressed? What cultural conditioning are to be incorporated or overcome?

The longing to penetrate a virtual space is something we are all familiar with from fairytales and films. Lewis Carroll's "Alice in Wonderland" trips head over heels down a rabbit hole and into another world. In Jean Cocteau's film "Orpheus in the Underworld", Jean Marais passes into the underworld through a mirror. He appears to penetrate the mirrored wall bereft of his physical body and finds himself in another time-space system. This is represented in the film by minimal body movements shown in slow motion. With the innocent eyes of a child, Alice discovers a world that grown-ups have long since forgotten. Her desire to play stimulates Alice to action. Her longing for adventure overcomes her fear of the unknown. Orpheus' love of Eurydice drives him to heroic deeds. Through their experiences in another world, Alice and Orpheus begin to see things in a different light and return to reality with a new outlook and zest for life.

In both cases it is specific symbols - the rabbit hole and the mirror - that mark the transition from one world to the other. The transition to another world is a key prerequisite for fairytales. Likewise the interface to the virtual world conveys different languages and perceptions. The interface is the key to the imagination. What is important is to push back the boundaries of perception and, wherever possible, to climb over these. In Cyberspace, the imagination space is a "house of illusion" that is generated in the machine and is projected by the body onto the body.

Rigid Waves - approaching one's "self"

"Rigid Waves" (17) transforms the acoustic mirroring of Narcissus and Echo into visual form. Narcissus gives up his body to his mirror image. The "self" becomes another (body). His own movements are only an illusionary echo. As the observer approaches the mirror, he is confronted with a mirror image that does not correspond to his normal perception of things. He

sees himself as an impression, as a body with strangely displaced movement sequences and, ultimately, as an image in the mirror that smashes as soon as he comes too close. He is unable to touch himself. A small camera hidden in the picture frame is used to place the observer in the image. The computer-controlled projection surface is controlled by an algorithm that calculates the distance to the observer. "Rigid Waves" is a virtual mirror which does not reflect but rather recognises. Sight and movement, approaching and distance are triggers for the unusual images. This is an attempt to see oneself from the outside, to stand side by side with oneself and to discover other, hidden "selves". In this fractured mirror, we are able to find ourselves, our "self" has been liberated. But how will I ever recognise myself again?

Liquid Views - the virtual mirror

The central theme of "Liquid Views" (18) is the well in which Narcissus discovers his reflection. He initially sees water as someone else, as another body. Like the small child in the various "mirror stages" described by Lacan, he decides to recognise his fictive body as himself. This installation has the objective of arousing the observer's curiosity and seducing him to undertake actions that bring him into contact with his senses. There are no written instructions of the keys to be pressed - as is often the case with computer installations. Instead of pressing keys and buttons, the observer must experiment with his own sense of touch. What is difficult about this is that the visitor is normally prohibited from touching exhibition pieces. A disused underground station under the Madrid Opera House is therefore a far more suitable location for the exhibition than a traditional museum.

Attracted by the sounds of water and a room of shimmering lights, the visitor approaches the virtual well. Seeing the image of himself he is tempted to touch it. Touching the image with his fingertip, the image in the water breaks up. Drawn by the sensation triggered by touching his own image in the water, the observer immerses himself in the situation. Liquid Views is also a metaphor for the Internet: while the person becomes lost in his own actions, he leaves traces behind and is monitored.

The images of the visitor are stored in the computer. During subsequent analysis we can spot the differences in communication behaviour of different cultural groups. Apparently, there is nothing more true than the cliché of stereotypical behaviour shaped by culture. Most people in Bonn are sceptical. In Zurich most people appreciate the installation for its aesthetic value. While in Hollywood we generally encounter artists who want to include our installation in their video clip, film or bedroom. "This is like having sex with my computer", whispers Coco Conn.



Fig.3. Liquid Views – exploring virtual water space

The two works "Liquid Views" and "Rigid Waves" break entirely new ground in the field of unsharp interfaces and virtual reality. Visitors find themselves wanting to touch the surface of the water or to alter things by changing the mirror image of themselves. These are reactions which make sense. The interface is not interpreted as such. It goes unnoticed and is not consciously perceived. These natural references turn Liquid Views and Rigid Waves into virtual

reality. The interactive behaviour of the observer as it is observed in the exhibition process is an integral part of the work and will find its way into new concepts.

The art educationalist Christoph Liesendahl gives his impression of the two works: "While the water in "Liquid Views" seduces the observer and draws him into its depths, visitors to the "Rigid Waves" work are afraid of the faceted image they see before them. Both works confront the observer with himself in different ways and examine how we react to our quickly changing surroundings. The body becomes an interface to a spatial experience in a virtual reality where it can itself determine how things are observed and the speed of the spatial experience itself. In doing so, it learns to stem off the flood of data and yet to play a role in the world of the telepresence.

Typically, the presence of space in coordinating one's own interaction plays a key role in both works. Both works look like environmental video installations. As "Liquid Views" is presented to the public in exhibition halls worldwide, the image space of the water is projected onto the four walls and the floor of the exhibition area. While the interactive observers forget their real surroundings and 'sink' into this virtual space, the onlookers are immersed in the water and its sounds and find themselves an integral part of this interactive environmental installation." (19)

The interface - an invitation to communication

Learning to see through the slowness of movement. Learning to hear though long forgotten sounds uninfluenced by images. Feeling what isn't there, in order to understand the synthesis. The poetry of the interface determines the dimension of interaction and one's own experience. What am I doing here? What am I experiencing, feeling? Stroking my hand over the water, coming face to face with myself, flying through space, holding my hand over my eyes. What does it all mean? The visitor is invited to examine these questions. It is an invitation to communication.

Man has lost the use of his senses. Eye/gesture/movement/speech recognition or body balance is used to test out the body as an interface. We attempt to rediscover the senses through the use of technology. In the virtual space, we practice for reality and live with a feeling of "as if". As if we are dreaming, as if we are grasping hold of the water, as if we are flying through the air, using just our bodies and the appropriate high-end technology. As if we are dying, falling, sliding, going into orbit, as if we are existing. We create "Imagination Systems" (20) - an electronic aura for ourselves. And do all this with the objective of existing in this or another reality.

There are still too few institutes that are examining these questions. Independent research sections are needed for media art and culture in order to be able to work continuously. Creativity and fantasy are the raw materials of the 21st century. Interdisciplinary teams can examine global problems and carry out artistic and scientific experiments. Cooperation between technology and industry is currently seen as a crucial measure for making large-scale research centres more flexible. Cooperation with theatre, dance, film, television and museums would lead to new products and productions, which would also show progress-driven industrial partners the need for reflection and the "ethics of preservation" (Hans Jonas).

Unlike "virtual" real-time, the real-life "now" time requires rapid action. A draft for the society of the next century cannot exclude today's communication instruments. Individual actions and collective responsibility must be today's goal - and not the mentality of constant progress. The time has come to test out the world of possibilities offered by virtual reality in order that we can remain functional in reality itself.

Monika Fleischmann & Wolfgang Strauss, 28 February 1997

NOTES

(1) Cf. Saint-Exupéry, Antoine; Der Kleine Prinz (The Little Prince), Karl Rauch Verlag, Dusseldorf 1992

(2) Cf. the first ART + COM presentation brochure from 1991 designed by Monika Fleischmann: "Forschung und Gestaltung in erweiterten Dimensionen" (Research and design in extended dimensions)

(3) The project "Neue Medien im Städtebau" (New media in urban planning) is put forward in 1988 by Prof. Edouard Bannwart (architect) from the Berlin Senate for Science and Research and is funded by DT Berkomp (subsidiary of Deutsche Telekom).

(4) The project "Gestaltung von Behaglichkeitsfaktoren im Raum: Licht-, Luft- und Schallraumuntersuchungen" (Design of comfort factors in space: investigations into light, air and acoustic space) is put forward in 1988 by Monika Fleischmann (art educationalist and artist) and Wolfgang Strauss (architect) and is funded by the Berlin Senate for Science and Research.

(5) The project "Visualisierung digitaler medizinischer Daten" (Visualisation of digital medical data) is put forward in 1988 by Dr. Wolfgang Krüger (physicist) and is funded by the Berlin Senate for Science and Research.

(6) Eco, Umberto; Über Spiegel und andere Phänomene; p. 12; DTV; Munich 1990

(7) Sonvilla-Weiss, Stefan; Narziss, Selbstbespiegelung oder Selbsterkenntnis? Narzissmus im Spiegel der Gesellschaft; Federal Ministry for Education and Cultural Affairs, Medienservice, AV Druck, Vienna 1996

(8) The Cyberstar competition and the award-winning concept are described in: Fleischmann, Monika; Cyberstar 95 - Visionen zur Gestaltung der Zukunft; GMD Spiegel 3/95, GMD Sankt Augustin 1995.

(9) We observe the public's confusion and the performers' curiosity during the television production using virtual sets which are produced live and at distributed locations on 19 November 1995 (similar to the presentation of the Video Art Prize in Schloss Birlinghoven and in Baden-Baden). Two days later, the two-hour live event is broadcast in a shortened, 40-minute version by WDR. The response is very gratifying, particularly as regards the design and staging of the two dance performances.

(10) The 1995 Video Art Prize is awarded by ZKM - Zentrum für Kunst und Medientechnologie and SWF - SüdWestFunk Baden-Baden. Jeffrey Shaw - head of the Institut für Bildmedien at ZKM - and Bernhard Foos - editor at SWF - commissioned us with the production of the entire real-life and virtual ceremony. With a small budget of DM 36,000, this experimental production could only be performed within the framework of a GMD research project (Distributed Video Production) and considerable investment of time and personal resources.

(11) Strauss, Wolfgang; Cyber City Flights; Leonardo - Special, 10/91, Munich 1991

(12) Fleischmann, Monika; Strauss, Wolfgang; Home of the Brain; Golden Nica for Interactive Art; Prix Ars Electronica, Ars Electronica 92 catalogue, Linz 1992

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(16) Fleischmann, M. et al.; The Virtual Balance, Proceedings 6th Interfaces, Man-machine interaction, Montpellier '97

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