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Towards a Philosophy of Virtual Reality: Issues Implicit in “Consciousness Reframed”

Stephen Jones

In July 1997 the Centre for Advanced Inquiry into the Interactive Arts (CAiA), at the University of Wales, held the first “Consciousness Reframed” conference. About 150 people attended, most of them involved in different fields of the media-arts: multimedia theory, web-site production and virtual reality (VR), painting, video and installation, art history and architecture, philosophy and the social sciences and teaching and ethics.

What does “Consciousness Reframed” mean? No one had a set definition, but the term provided a great stimulus to explore ideas about consciousness: from neuro-physiology to artificial intelligence, from extra-sensory perception to shamanistic trance practices, from the Internet to VR installations and from constructed ways of seeing to the role of geometry in painting. Roy Ascott, the chair of CAiA, in his preface to the Abstracts for the conference, put it this way:

Interactions between art, science and technology are leading to the emergence of new cultural forms, behaviours and values. It is within the field of Consciousness that this is most marked and at the same time least understood. This conference has been convened in order to open up informed discussion of the issues this raises and to examine what might be described as the *technoetic* principle in art [1].

The term *technoetic* is the key. It refers to our use of *technology* in cultural production, and it also refers to the *noetic*, or how we understand the world and our processes of being in it. This suggests the exploration of how technology is changing our perceptions of the world. Certainly many of the papers and discussions that represented the huge diversity of practice in new-media arts focused on this issue.

HUMANIZING TECHNOLOGY

A primary issue confronting new-media artists is the politico-economic question of the human and environmental impact of their work. This applies to all our technological activity. Modeling our ideas is an ancient and deeply human practice in which we engage with the world in our process of understanding it. Modeling leads to reflection on our productions, to new ideas and inventions and may also lead to critical thought about what we do. We need to pay more attention to the impact of our activities on other systems. To “humanize” technology, we have to take into account the biological and emotional aspects of our being. Notions of feedback and self-organization allow us to account for the consequences of what we do.

Char Davies addresses this techno-cultural problem in her work *Osmose* [2]. A person entering the installation is pre-

sented with images on two projection screens: on one is a silhouette of the person “flying” the work (Fig. 1) and on the other, the space that he or she is “flying” through (Fig. 2). It is an elegant and evocative work, with the image and music presenting a floating, wistful feel. One flies through translucent underwater-like jungles and crystalline spaces as well as worlds of text and the underlying computer code.

In her paper “Techne as Poesis: Seeking Virtual Ground” Davies speaks of *Osmose* as being a *poiesis* or bringing forth, revealing our being in the world. The prime navigating tool is the breath. On breathing in, one rises through the virtual worlds; on breathing out, one sinks slowly into deeper realms, until one gets down to the core machine-code world. Davies likens the experience to one of diving rather than dreaming. The participant gains a sense of being removed from the everyday world and “immersed” in some environment that does not necessarily behave according to the rules of the known. The conscious use of breath, combined with a feeling of balance in the immersant, undoes our habitualized everyday perceptions and leads to altered states of consciousness.

Through its use of the breath as a navigational tool, immersion in *Osmose* produces an emotional experience. This emotional character of *Osmose* brings one to a new experience of the technological. Response to the experience of *Osmose* is often a feeling of its ineffability, its indescribable nature, “an unfathomably poetic flux of comings-into-being, lingerings, and passings-away within which our own mortality is encompassed” [3].

Thus, for Davies and many other new-media artists, humanizing technology involves a subversive generativity of ideas and of methods for handling technological presence. It involves opening up, diversifying, re-connecting, so that anything we do with the *techne*, we can sidestep, redo, or recast when it is put to inhuman tasks. The trap is that we just end up feeding the business world with even more new things that it can capture. But to stop, to relinquish the critical stance, to cease being generative is to degenerate and to cease to exist.

ABSTRACT

This paper reviews the first “Consciousness Reframed” conference. A number of artists’ works in media such as virtual reality and interactive installations are discussed, and various issues relating to “technoetic” artworks are raised. These issues include questions such as the potentially dehumanizing nature of technology, the transcendent states claimed for cyberspace, the nature of immersion, and aspects of the problem of consciousness. The author offers some suggestions regarding how technoetic art might tackle such issues.

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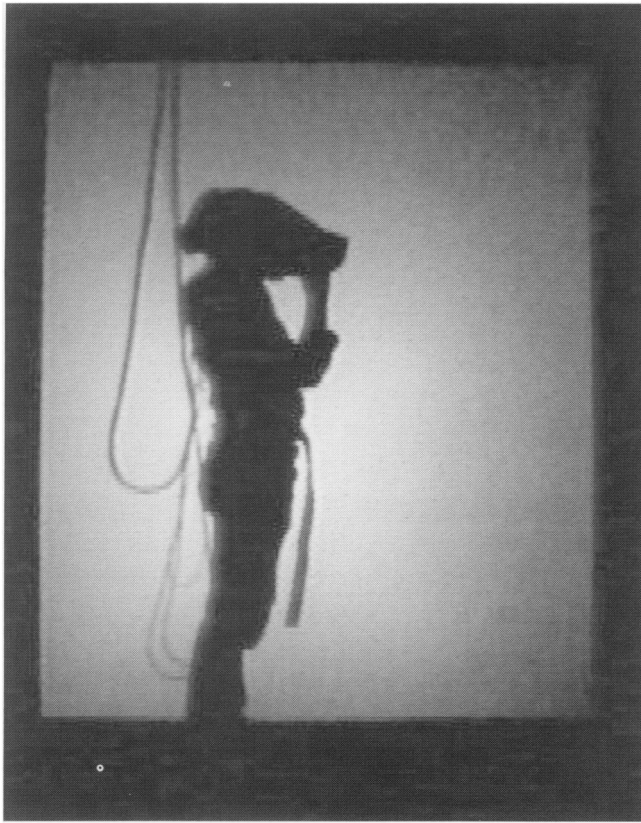


Fig. 1. Char Davies, shadow screen silhouette (video still) from video work *Osmose*, 1994–1995. (© Char Davies/ Immersence Inc./ Softimage Inc.)



Fig. 2. Char Davies, “Rocks,” real-time frame capture from video work *Osmose*, 1994–1995. (© Char Davies/ Immersence Inc./ Softimage Inc.)

VIRTUAL REALITY: DREAM SPACE OR SHAMANISM?

The affective experience in *Osmose* and other VR works reconstructs our relationship with technology. Davies opens up an issue pointed to from many different sources during the conference—namely, what exactly is cyberspace/VR-space? Is it a dream world? Is it some sort of trance space? And is the artist/producer of cyberspaces akin to the shaman in tribal culture? For many, VR has acquired dreaming or shamanic characteristics, largely because one is removed from the world when taking on the helmet and harness of the VR installation.

Margaret Dolinsky in her paper “*Dream Grrrls: A World of Virtual Reality*” speaks of VR as being an active or “lucid” dreaming. Her work *Dream Grrrls* was developed for the CAVE, a display system developed at the Art Institute of Chicago. The CAVE is an immersive virtual theater, a 3-meter square, high-resolution, stereo video/audio projection environment. The spectator walks around wearing stereographic glasses, interacting with objects in the virtual environment in an experience similar to dreaming. *Dream Grrrls* “is a journey through five different environments that present an opportunity for exploration and self-reflection . . . in new and dynamic ways, much like an active or lucid dreaming” [4]. Navigation is more about encounter than control, as one experiences the elusive nature of the dream world. Paths meander, allowing “the participant to create a personal performance by learning to interact with the environment and recognise its plasticity” [5] (Figs 3, 4).

Dolinsky provides active dreaming spaces where one can explore desires and dream versions of oneself. The options provided by the artist allow the audience into realms to which they may ordinarily have only secondary access (e.g. reading) but to which they do not normally have primary experiential access.

Beyond dreaming are the trance states of the shaman. British artist Kathleen Rogers in her paper “Viperscience” explores Mayan shamanism through the mythology of the snake. She “draws on the work of the unorthodox anthropologist Jose Diaz Bolio from Yucatan, Mexico . . . author of *The Feathered Serpent—Axis of Cultures*” [6] to explore the role of the rattlesnake in Mayan art and religion. Rogers “proposes that the plumed serpent in the image of the rattlesnake embodied the essential physi-

cal resonance, energisation states and vortex mechanics to become a living psychic software” [7]. The priests of the Mayan culture used the “harmonic geometry of the snake skin as mask for scrying [i.e. divination]” [8] and similar shamanic activities.

For Rogers, the snake represents many things—from spiritual energy (e.g. the Kundalini in Hindu Tantra) to the creation spirits of indigenous Australians to the double helix symbol of DNA in the modern West. Her intention “is to re-activate this complex model of Mayan consciousness” [9]. Using VR immersion and multimedia to emulate these trance states, she produces an “interactive mythology” as a cognitive archeology of the snake in its representation of spiritual energy as well as the cyclical notion of time held by the Maya.

Brazilian artist Diana Domingues in her paper “The Desert of Passions and the Technological Soul” also presents the potential for VR to bring out shamanic states. She likens the screen of VR to the idea of the desert as a place for losing the self, a screen onto which our dreams and desires may be projected, thus giving it a role in the shamanic practice of ancient cultures as much as it has a role in contemporary culture (as evidenced by the many films in which the desert features almost as a character). For Domingues, creative production is a way of losing the ego. She makes “interactive installations for people to experience consciousness propagation in an organic/inorganic life. Electronic interfaces and neural networks provide intelligent behaviors, managing signals of the human body in sensorized environments” [10]. Electronic ritual and trance, interfaced with electronic memory as “virtual hallucination,” thus produce a shamanic experience through an interactive work (Figs 5, 6). Participants become the shaman, allowing them to “communicate with the beyond and intervene in the real world because they dialogue with spirits. The participants’ behaviors determine the life of the environment” [11].

Mark Pesce (the inventor of Virtual Reality Mark-up Language [VRML]) in his paper “Ritual and the Virtual” suggests that the networks of cyberspace are essentially incomprehensible. For Pesce, cyberspace is mythological space, dreamtime or “faerie,” a space of magical reality. “The forms of magical reality, ancient to humanity’s beginnings, shape our vision in the unbounded void of electronic potential” [12]. He suggests that our cur-

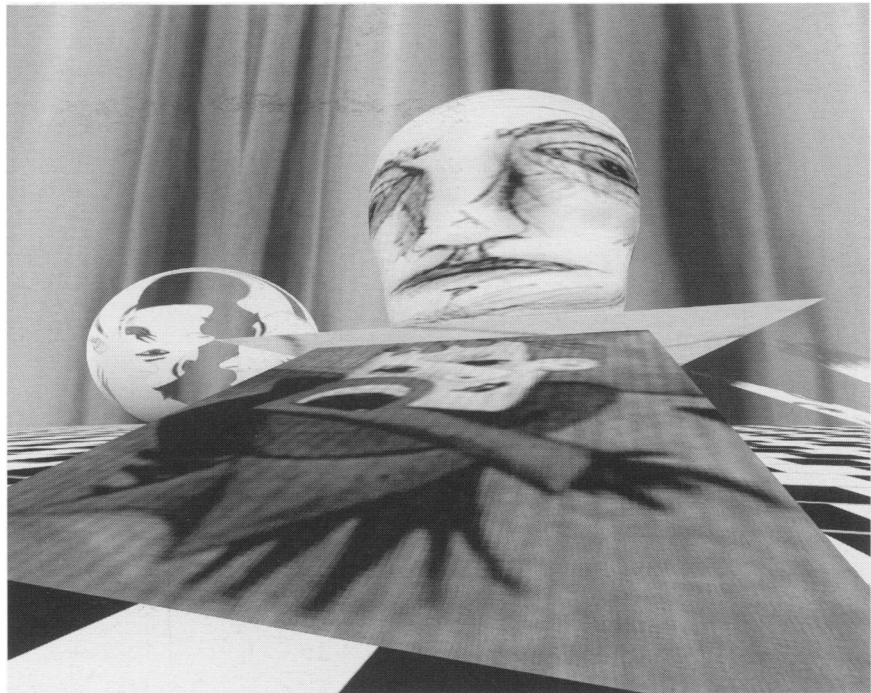


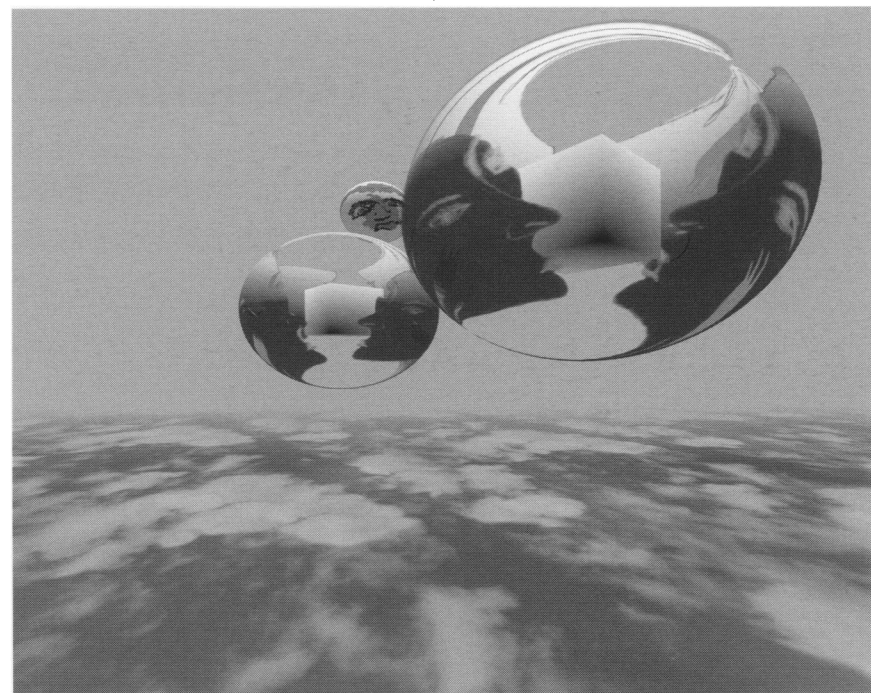
Fig. 3. Margaret Dolinsky, “Labyrinth IV,” from *Dream Grrrls*, computer automated virtual environment (CAVE), 1996. (© 1996 Dolinsky, Sehmisch & EVL/UI)

rent relationship to cyberspace is analogous to our primary ancestors’ relationship with language and with their world at the time when their cultures were still isolated. It is as though cyberspace provides a dream-like, almost hallucinatory configuration of our perception, becoming a screen for the projection of our spiritual desires and interests. “In a

world of unbounded complexity, [we] compress and complexify symbols into the barest essentials of meaning: in this way the ancient narratives become myths” [13].

These artists suggest that VR and cyberspace are tools for inducing transcendental states in the immersant. Is this possible? Most VR works provide only

Fig. 4. Margaret Dolinsky, “Sesa World I,” from *Dream Grrrls*, computer automated virtual environment (CAVE), 1996. (© 1996 Dolinsky, Sehmisch & EVL/UI)



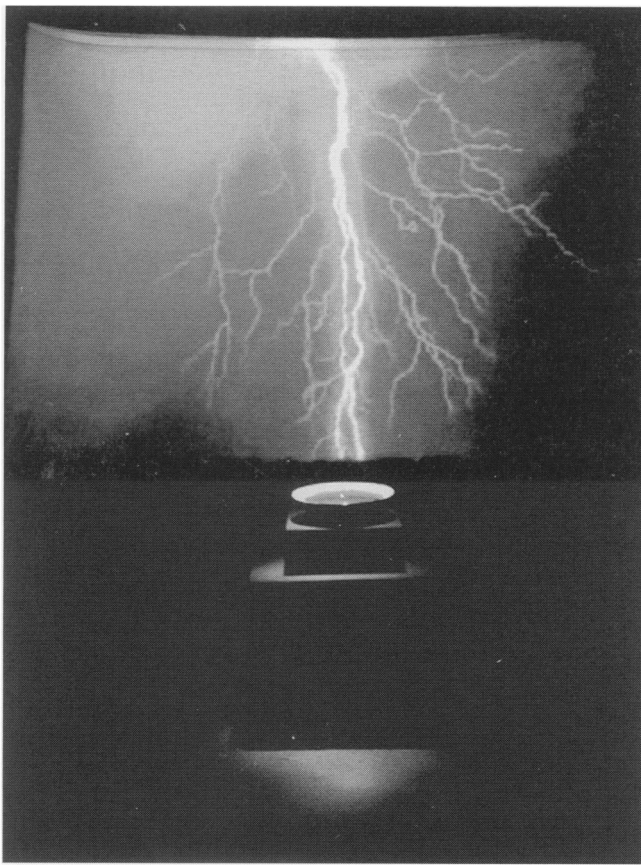


Fig. 5. Diana Domingues, “Raio,” from *TRANS-E: my body, my blood*, interactive installation, 12 × 8 m, 1997–1998. (Novas Tecnologias nas Artes Visuais Universidade de Caxias do Sul—Brazil. © Diana Domingues.)



Fig. 6. Diana Domingues, “Catalogo,” from *TRANS-E: my body, my blood*, interactive installation, 12 × 8 m, 1997–1998. (Novas Tecnologias nas Artes Visuais Universidade de Caxias do Sul—Brazil. © Diana Domingues.)

pre-programmed options, requiring us to accept another’s view, and as such new states cannot actively be drawn out from our minds. In order to develop a form allowing a dream or shamanic experience in VR, we must provide a structure capable of considerable mutability in the available experiential options. The shamanic trance is a surrendering to external “spirit” presences via the production of ecstasy within the participant. The shaman is the controlling agent in these activities and is not “possessed” [14]. In contrast, dreams are fluid, discontinuous, disruptive experiences in which unpredictability is almost a necessity. The dreamer is out of the control loop, being asleep [15]. Nevertheless, experience gained in either condition is usually considered to be out of context, an irruption into the normal stream of consciousness.

Though it may well be possible to entrance an immersant using VR, I suggest that shamanic presences are another thing altogether. As for the analogy with dreams, VR may be able to produce similar irruptions and unpredictability, but this will require considerable development in the means of generating and navigating cross-connections in the content of the work. Some hints appear in the work of Bill Seaman.

Bill Seaman explores possible emergent experiences in his paper “Emergent Constructions: Re-Embodied Intelligence within Recombinant Poetic Networks.” Seaman is developing a theory of navigation within cyberspaces which involves a process of “recombinant poetics.” According to Seaman, “computer-mediated networks present an artistic medium which heightens the potential for an intermingling of the knowledge of the viewer with the ‘re-embodied intelligence’ of an author” [16] in a new form of poetic construction. The participant interacts with the meanings encoded in the work by the author, developing “an emergent experience, which is not known in advance by the author, and is unique for each subsequent viewer” [17]. Seaman suggests that “such an environment [can] enhance or trigger particular ‘states’ of consciousness in the viewer [reframing] aspects of the consciousness of the artist” [18]. He then discussed how this idea was developed in his work *Passage Sets/One Pulls Pivots from the Tip of the Tongue*, as well as in his new work the *World Generator*, which carries “compressed potential meaning constructed of language, image and sound elements within an engendered technological environment” [19].

In Seaman's *Passage Sets* [20] the viewer is presented with three video projection screens of image and text. The center screen contains a "menu" controlled by a mouse on a plinth in the viewspace. As the mouse rolls over words in this menu, new combinations of visual, sound and textual elements are displayed, enabling one to explore the poetic dimensions of any of the phrases Seaman has provided in the menu (see Color Plate B No. 1). The menu shifts and alters form, and the screens on either side present video and textual resonance, with oblique references making puns across the screens and within one's reading/memory space. The work is deep and evocative—with imagery taken from architecture to gesture to bodies in spaces public and private—and allows navigation through an everchanging poetry constructed afresh from the elements originally supplied (Fig. 7).

Seaman's techniques of recombinant poetics offer us access to a randomized supply of ideas and language. Puns and double-entendre emerge from the vocabulary provided by the artist, but the combinatorics are stochastic and supplied by the user. These then generate all sorts of unexpected thoughts and interpretations in the viewer.

The real activity of an artwork for the contemporary audience is in the emergence of new ideas and new triggers for interpretation through the experience of the work. This has always been an aspect of the contemplation of an artwork, although historically the viewer's experience has been more passive. In VR and cyberspace the artist may be able proactively to generate emergent ideas in viewers as they experience the immersion.

WHAT IS IMMERSION?

Both dreaming and shamanic trance are states that require total immersion in the experience. But just what is "immersion" in VR? How do we define it and how can we distinguish it from other mental states within consciousness, such as being absorbed in a book or film? What degree of suspension of disbelief is needed, what agreements with the artist do we make in entering cyberspace, so that the artist can bring some sort of version of the conceived experience to us?

Joseph Nechvatal in his paper "Immersive Implications" suggests that technoetic connectivity provides a tool for society to understand itself. It reworks and redirects the perspectival point of view: "The classic Cartesian duality between subject and object becomes



Fig. 7. Bill Seaman, "Rotate Soft Erobotic Agent Spokes," from *Passage Sets/One Pulls Pivots at the Tip of the Tongue*, digital image, 1995. (© Bill Seaman)

omnijective, iridescent, shimmering and porous in its inversions" [21]. Immersion is enveloping, physical rather than cognitive, and different from one's absorption in a book or the cinema. For Nechvatal, immersion in VR implies a unified total space, a homogeneous world without external distraction, striving to be a consummate harmonious whole. Identifying "two grades of immersion . . . (1) cocooning and (2) expanding, within which, when these two directions of psychic space cooperate . . . we feel . . . our bodies becoming subliminal, immersed in an extensive topophilia . . . an inner immensity where we realise our limitations along with our desires for expansion" [22], he asks, "Do VR's immersive attributes permit us to support non-discursive intuitive generalisations from which to weave a philosophy of virtual reality by adapting principles of complex generosity?" [23]. He adds that with a "specifically spherical way of conceiving encounters" [24] a new "perspective" is afoot within VR (Fig. 8). Nevertheless, he warns, as continuous total immersion would be monstrous, we should regard VR as a modeling system in which artists can generate the "countless, but short-lived, experiences and observations that can be exact only because they are brief entries into the encompassing phenomenon of a shimmering deframed consciousness" [25].

Davies' *Osmose* might provide the paradigm example of immersive space: one dons the helmet and harness and enters a floating world, where everything is translucent and jungle-like—enveloping worlds of imagination, though

not one's own but the artist's. The point of view in the immersive world is omnidirectional, a point of hearing rather than of view. One's head is the origin in the center of a sphere, the aural center of perception in the jungle. The primary sense in the jungle is hearing; sight is interrupted by the forest. We can see only the most local distance, yet we can hear a vast world of sounds.

Fig. 8. Joseph Nechvatal, *Viral Scream*, robot-assisted painting, 1996. (© Joseph Nechvatal)



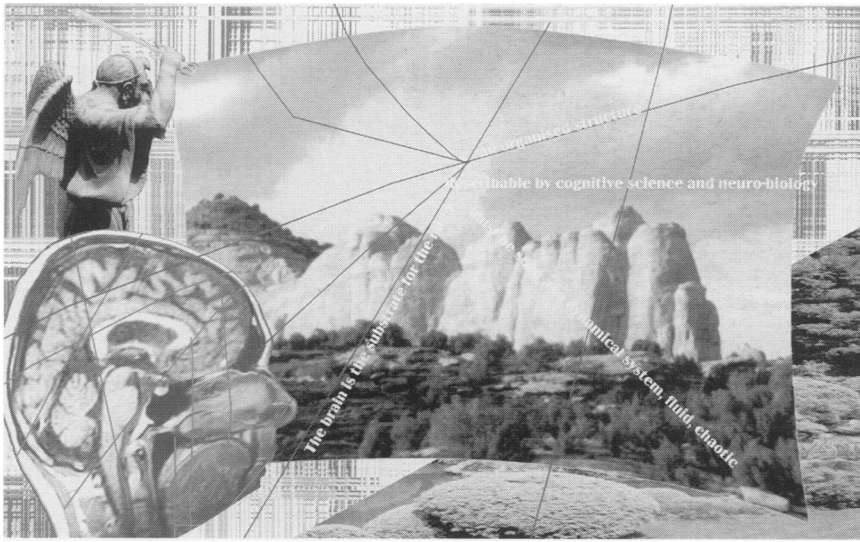


Fig. 9. Stephen Jones, *The Brain Is the Substrate*, digital image, 1997. (© Stephen Jones)

Immersed in VR, we are placed at the center of a realm based on polar coordinates: wherever we turn, our perspective follows, the sounds of the cyberjungle lead us. The view is revealed only as we penetrate deeper into recalculated space. As art historian Suzanne Ackers suggests, Renaissance perspective is displaced, and we are learning new ways of seeing, navigating in new kinds of conceptual space [26]. Point of view no longer operates in its traditional manner; it now alters over time, and our perception of time and space becomes a virtual knowledge, no longer fixed to the Cartesian frame: mutable, always recalculated, determined by our progress through the environment. Consciousness can only follow along, hoping to make the necessary adjustments before we fall out of the world. Our internal center is temporarily dislocated from our external center; suddenly we do not know where we are.

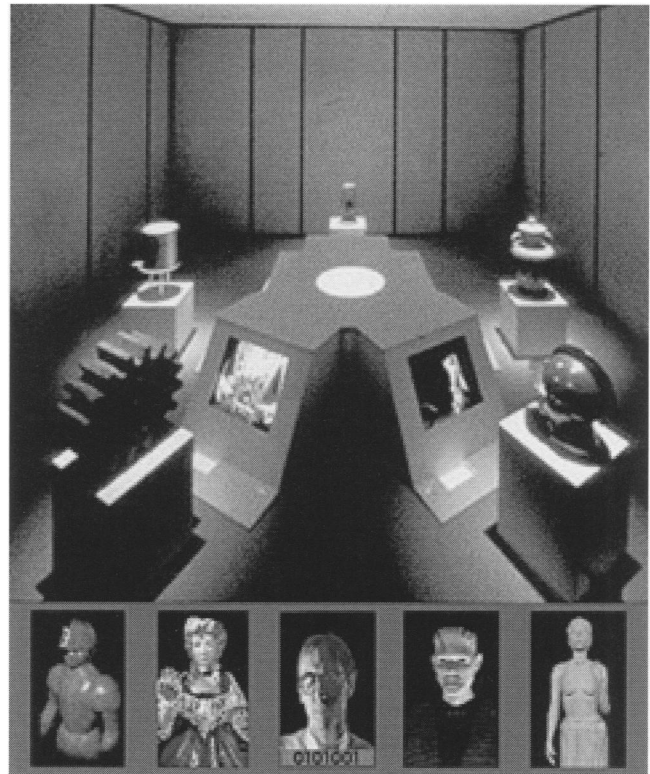
According to Nechvatal, the immergant in VR is cut off from the world in a fusion of sight and sound where a “radical unity and aesthetic transcendence through totality . . . provide a complete alternative reality to the viewpoint for exploration and contemplation . . . immersive art striving towards a consummate harmonious whole” [27]. The experience of VR is one of omni-perception transcending formerly known territories. As Davies amply demonstrates in *Osmose*, the world visually perceived becomes one of multiple layers as well as one of fluid viewpoint: worlds layered as sheets of knowing through which we can navigate, each sheet providing its own enveloping omni-projective space.

In her paper “Perception of Individual Time,” Ackers points out the role of geometry and mathematics in our perception. She asks how this has altered over the history of art and how it appears in VR work. “Geometry played a crucial role in the development of Gothic architecture. Today, we easily perceive the numerical harmonies in a cathedral’s facade or interior space. What about our perception of the numerical harmony in digital images?” [28]. For example, in *Osmose* the visuals “can be seen in the context of pic-

torial tradition, the dimension of time is an addition which has only been made possible by the complex use of numbers, and of computer programming” [29]. The interval of our immersion in *Osmose* provides a perspective that is time-based as well as spatial; this perspective constantly perturbs our usual sense of locus in space and time. This is a new kind of aesthetic experience where time plays an important role in our view of the work.

In the audience’s contemplation of a painting, the durational element becomes little more than a slightly extended present, whereas involvement in VR, new-media or video work forces one to spend some time with the work simply to gain any idea of it at all. Being captured by the work becomes another factor in the immersion. Duration as a dimension of an artwork allows the producer of the work to introduce a series of ideas, or a flow and mutation of one idea, which is not available in most painting or sculpture. Time allows an audience the luxury of contemplating the work, of exploring possible interpretations, and it allows artists the luxury of extending and developing associations and permutations of ideas. It is this which promotes interaction as much as any “hands on” operability of the computer-driven work. Just as conversation takes time to develop, so does one’s conversation with an artwork take time to

Fig. 10. Jill Scott, installation shot of “A Figurative History,” from *Digital Body—Automata* (at ZKM, Karlsruhe, Germany), interactive hybrid environment, 1997. (© Jill Scott)



develop, being especially enhanced if the feedback from the artwork is active. Our perception can change, or be changed, over time as the feedback loop between us and the artwork is allowed to develop.

IS LANGUAGE NECESSARY FOR CONSCIOUSNESS?

Another issue in the exploration of the noetic is the extent to which language is necessary for consciousness. Cognitive science usually argues that language is essential for consciousness—otherwise, how could we report our experience? But this becomes a rather restrictive view of what it is to be conscious, much like the question of the difference between immersion and absorption. Are we conscious if lacking language, or are we simply aware? Obviously, at this point it all depends on how one defines consciousness. Given that, for most of us, even a cat could be considered conscious, language is surely unnecessary.

Australian artist Isabelle Delmote in her paper “*Epileptograph: The Internal Journey*” introduces an audio-visual exploration of her “sensations experienced during the awareness process leading to the regaining of consciousness after a generalised epileptic seizure” [30]. She focuses on the hidden internal language of the body, revealing the reaccumulation of the self as a visceral and frightful process that leaves only glimpses of imprecise memory. Showing a video version of the computer-graphic material she has generated from her deep, direct experience of this prelinguistic “reaccumulation of myself as a functional being” [31], she questions the extent to which consciousness depends on language. She suggests that “a visceral and thoughtless process, which lacks any form of language [can be] part of our notion of consciousness” [32], given that she can bring the experience to visual manifestation and so in some sense is conscious of what happened, if only through memory.

On the other hand, Mark Pesce makes some interesting remarks about the relationship between language and consciousness. He argues that to think requires the linguistic distinction of figure and ground, the detection of the object, and it is difference that enables this detection. Discontinuity, not the narrative, is what we see. Language is the encoding of these differences, and so language leads to consciousness. Ritual is the cultural storage of this encoding into my-

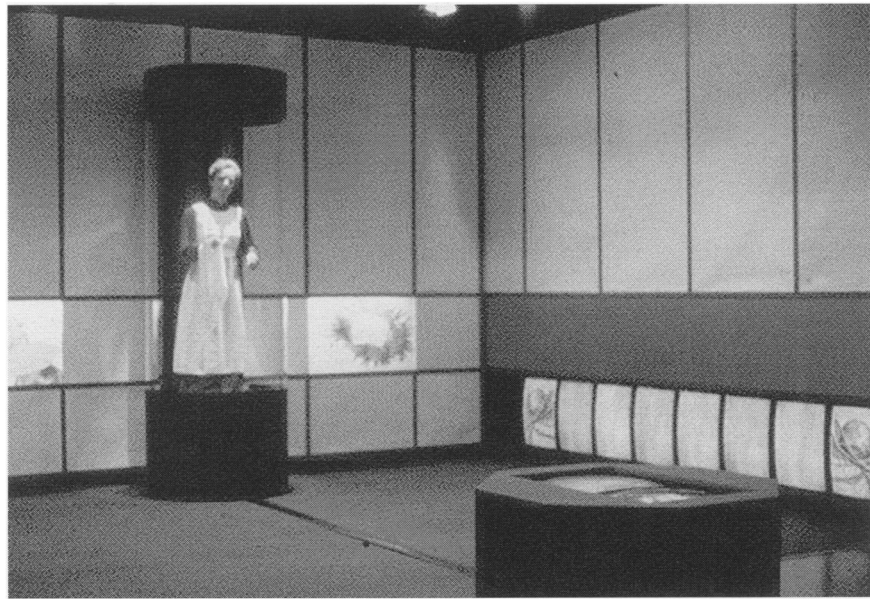


Fig. 11. Jill Scott, installation shot of “Immortal Duality,” from *Digital Body—Automata* (at ZKM, Karlsruhe, Germany), interactive hybrid environment, 1997. (© Jill Scott)

thology, and he suggests that ritual is the language of cyberspace. The virtual world of cyberspace is a mirror to the virtual world of our cultures, illuminating “the magical reality of all human narratives” [33]. He highlights a connectivity within societies wherein the whole of human culture might be seen as a single organism, and he may be suggesting that culture is a conscious thing.

Where does one draw the line between consciousness and mere awareness? The domain becomes too exclusive if one draws it too high, say at the level of requiring language. It is like arguing that visual processing is necessary for consciousness: What then of the blind?

I suggest that we open up the concept of language to include any of the possible means of showing that we are using information from the world in ways that are useful to ourselves. We can report this use in many ways: making art or otherwise demonstrating our consciousness of things about us. Mere awareness falls away with the idea of using the information for our own purposes, reflective activity having such output as might indicate that we are actively working with this information. Reportage becomes cultural production. This would certainly accommodate the kind of consciousness that Isabelle Delmote speaks of in *Epileptograph*, where she describes a realm of knowing, in which language is as yet unavailable, but her experience of reassembling herself forms a viscerally potent content of her mind, ready for reporting at such moment as reporting becomes possible.

THE POST-BIOLOGICAL?

What of the post-biological? In my paper addressing this issue [34] I speak about the kinds of behavior people display that allow one to say they are conscious. The primary criterion might be that an entity *does something for itself*. Then, on the basis that there is a physiology of the brain/body that consciousness runs on, I explore the possibility of a complex self-organizing physiological process that produces conscious subjective experience (Fig. 9). The different social/cultural configurations in which conscious entities may be immersed lead to the diversity of possible epistemologies in the world, as well as to the possibility of machine consciousness. The possibility of intelligent machines is a rumor in the background of much interactive new-media artwork as well as computing research. As such, it seems to be part of the deeper motives in new art, as well as being entwined with the ideas of the post-biological—the body/brain/mind re-embodied in a technological edifice of some sort. As Bill Seaman says: “I am interested in interactive art works that exhibit ‘intelligent’ responsiveness to viewer input” [35].

Jill Scott in her presentation “Future Bodies” introduced her three-part installation *Digital Body—Automata* at ZKM Medienmuseum, in Karlsruhe, Germany (Figs. 10, 11). These works “encourage intimate and contemplative and interactive participation on the part of the viewer and center around a similar theme; the exploration of the desire to transform the human body by technology and the effect technology may have on

the design of the human body in the future" [36]. Part 1, *A Figurative History*, is an interactive touch-screen that explores "fantasies about the mechanical transformation of the body by technology" [37]. Transformations of "these bodies [are] further extended by the touch of the other viewers in the space, as well as mechanically through the sculptural interfaces" [38]. Part 2, *Interskin*, is a VR game in which "players can 'go inside' separate body parts, guided by selected 'avatars' or 'agents' . . . one can explore the gender and identity of a second self or other body which may reside deep inside the viewer's personality" [39]. Part 3, *Immortal Duality*, explores the paradox of science in molecular transformation from the early discoveries of radiation to "the latest developments in DNA manipulation and Human Genome Mapping" [40]. An interactive automaton presents "a depiction of ethical issues about anti-aging, cloning and reproduction . . . and the viewer can interact with these to compose associations of their own" [41].

IN CONCLUSION

Why are we conscious at all? asks Carol Gigliotti in her paper "What Is Consciousness For?" Why do we possess this unique "space in which we spend a major portion of our life?" [42]. Our navigation through our own domestic worlds as well as our wider social worlds informs and configures "our involvements with contemporary interactive technologies" [43]. If we do not ask the basic questions about why we are conscious, then what of our productions, cultural and otherwise? "Why construct virtual environments? Why construct artificial life environments? Why do we feel the need to create something when we seem to have so little understanding of why the natural world exists?" [44]. What do we miss about ourselves and our being in the world if we go straight to the question of technological consciousness? Perhaps we should look critically at why we do these things and at the impact they have on our society and on other non-language-based conscious entities: animals and other creatures. Gigliotti writes:

If, as I surmise, one purpose of consciousness is to help us make our way through constant change, then we may need to better understand the limits that fear imposes in us in understanding both our own consciousness and

our involvement in the development of artificial life forms with consciousness of their own. We may want to ask ourselves: could it be that our consciousness is for making only our meaning in the world, imprinting only ourselves on this vastness, bettering the planet and perhaps space, with only our intelligent creations? But then what is animal consciousness for? And for that matter, what would robotic consciousness be for? . . . How can we hope to understand and develop a positive relationship with beings of our devising if we understand so little of the incredible richness of those beings that already exist and share our conscious and unconscious space here and now? [45]

I suggest that consciousness is a result of the self-organizing capacity of the brain in its milieu: the body and the world. Cultures supply and inform the spectrum of possibilities for how consciousness is organized. The production of artworks employing some of the feedback-driven, autopoietic capabilities that we embody offers some leads to the solution of the problem of a technologically determined culture. If this kind of work can become complex enough, or if enough connectivity can be developed among these works—say, over the Internet—then is it possible that the system that thus evolved might in fact be conscious? And if so, what then?

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