

VIRTUAL BODIES

CATHERINE RICHARDS

I see nothing. A voice asks me to hold up my gloved hand. Wavering before me is a free-floating drawing of a hand. "Make a fist." I do. The drawing waits, makes a fist. "Now extend the first finger, ... now the next, ... the next ... and next ... finally the thumb." I perform, the drawing performs. "Calibration seems okay." My virtual hand is ready.

Virtual reality (VR) seems highly charged. It represents a technological constellation of ideas — full of many contradictions and dilemmas. One of the most provocative issues manifested by VR is the contradictory treatment of the body. On the one hand, it offers an implicit promise of omnipotence as an idealized, bodiless "experience." On the other hand, the actual body itself is almost sensory-deprived, as if submitting to some kind of medical testing. I virtually fly like superwoman, zoom through walls unscathed, scale myself down to play with molecular structure, grab worlds and change them to my point of view, yet my flesh is in bondage and my senses are blinded. This reconstruction of the mind/body split is puzzling, to say the least, since it is an outdated paradigm in science and unfashionable in conventional medical circles.

As number of proponents would say, VR promises a freedom that is limited only by our imaginations and, furthermore, that the artificial sensorium we can create for ourselves will be more satisfying than our relationships with the real world. A spectator (participant) is promised mastery of a realm of creation (or destruction, as seen in the Gulf War media coverage), a realm of the mind — seemingly abstract, cool, clean and bloodless, idealistic, pure, perhaps part of the spirit, that can leave behind the messy, troublesome body and the ruined material world. Far from being left behind, however, the flesh forms the essential site of VR. It is the site of fictions made material, fictions which are the images of our subjectivity — how we know what we are.

How is The Body Read?

What is attractive to me at this stage of VR's technological development is the way its entrails hang out unself-consciously. If it wants to trace the body it does so as directly as possible. A tracker is stuck on, connected by a wire to the computer. I wear a helmet or goggles and the machine follows my head motion. If I wear a glove, it reads my basic hand movements. If I wear a body suit it will, obviously, interpret even more motion. It is an overt visualization of the person/computer relationship that is too obvious for all but the initial stages of development. Already there are attempts to make such processes as invisible as possible. A special room, for example, has been constructed to track the body wearing a particular hat. But no matter how imperceptible it becomes, we still, in effect, dress in its gloves, suits and hats. It is an intimate layer always watching.

My Body is a Data Source

Let us look for a moment at what kind of body such a reading implies. It is a body of a spectator who resembles, if anything, a nerve centre, a signal conduit. It is a node where impulses can be translated, retranslated, switched like signals on a phone line and manifested in any kind of representation — sound, image, motion, event. In many ways the reading is not unlike the current medical practice of surveillance of vital signs, for example. The difference is that signals from the body are collected not just to be read but to serve as a numerical source that initiate happenings in the virtual world.

In many respects the body, as a kind of universally coded information event, is too familiar to notice. It is endemic to our culture and we see many versions of it, including the current Human Genome Project attempting to catalogue genetic coding. It is instructive to consider this as a modern metaphor for the body. Though many complementary assemblages of ideas and practices across all parts of western society have refined this powerful image of the body, I want to look at one moment in particular as a way to highlight this model of the senses.



Art historian Jonathan Crary has investigated the radical break in the mid-1800s between classical and modern conceptions of the observer/body.² I would suggest that in the modern image of the body we can see some of the roots of VR — especially the dream of reading and enclosing all the senses. Crary claims that the status of the observer was transformed with the collapse of the classical models of vision in the first half of the 1800s. The classical model of vision was understood by geometric optics, an incorporeal relationship between the perceiver and the object of perception, an external process undertaken by an individual with clear boundaries between inside and outside, subject and object, within a stable space. In the modern transformed observer, vision became a bodily process, one understood through physiological optics. The observer was repositioned in undemarcated terrain where the distinction between the internal sensation and external source was irrevocably blurred.

Key to this change was the work of the 19th century scientist Helmholtz. He compared the nerves in the human body to telegraph wires which, irrespective of the stimulus or apparatus, responded everywhere the same. He was explicit about the body's capacity for multiple connections with other agents — personal or mechanical. In his view, the perceiver was a neutral conduit, one kind of relay station among others that allowed optimum conditions for circulation and exchange. This laid the groundwork for the image of the body as something that could be plugged in.

Leaping to the present we can see elaborations and logical extensions of this persuasive image. If the brain is a computer and the spine is a coaxial cable,³ as scientists such as Marvin Minsky have suggested, then it extends the image of the nervous system as an information network. Thus, having shed the nineteenth century perspective of the body as a self-contained organism, the body cannot now be distinguished from the information it requires to function. As a result, it is illogical to keep it unplugged from its environment — keeping it in the dark, as it were.

Finding the best way to plug in the body, through the nervous system, now becomes an issue of technical speculation driven by metaphorical images of the body. The VR body suit makes for some startling pictures, but it is a very awkward way to collect body data. It is an even worse way to feed data back to the body. Minsky, a Donner professor of science at Massachusetts Institute of Technology (MIT) where he

co-founded the artificial intelligence laboratory, suggests implanting a small computer in the brain to optimize input and output signals with virtual environments. While this is a relatively novel concept to consider for the civilian population, it has been discussed in the air force as a technical solution to increase the response time for fighter pilots. Minsky's idea also implies the involvement of the medical profession. For several years now a surgeon in California has surgically embedded little chips in damaged hands to guide the regrowth of nerves. He is then able to rematch them to the existing ones. Minsky expects the next thirty to forty years to bring the ability to directly intercept the nerves.⁴ He suggests that it is an evolutionary step not only for humans but for the human world: "You can make worlds that are intelligent. The trouble with the world we're in, is that it's... not interested in humans and does not have our interests at heart."⁵

The image has expanded so that the digital body is now part of the evolutionary image, one in which all bodies either improve as a species or disappear. Obviously, something is wrong with our old bodies, so seriously wrong that we cannot compete. Is it that we cannot keep up with our machines? Is it that we die? Is it that the world is imperfect for us? Is it that we have made the world imperfect? In any case, our bodies do not just improve — they evolve. They evolve by plugging into powerful machines, becoming more obviously cyborgs. We are now, as George Grant so graphically put it, half metal and half flesh, even though our machines

are silicon, made of sunshine.⁶ Grant offers a dissenting view of Minsky's position by calling attention once again to the powerful impetus of an image and alluding in his argument to its political implication: "[M]odern men have been extremely violent in their dealings with other men [sic] and other beings. Liberal doctrine does not prepare us for this violence because of its identification of technology with evolution, and the identification of evolution with movement of the race to higher and higher morality."⁷

Let us return to Minsky's discussion of this image as he adds a new twist which is of particular interest to artists. We should "go beyond these VR instruments" he says, "and implant a little computer in the brain to send signals back and forth from it, which would give us the ability to extend our own motivation and the signals inside ourselves to cause things to happen in the outside world." The result, he foresees, is that "Maybe most of us who are not artists could be artists if we could express what our subconscious wants."⁸

Linking the artist to the development of science and technology is not new. In the domain most relevant to my discussion, that of computer imaging and VR, the relationship has had an odd ambiguity. There have been many calls from the scientific and technical community for artists to bring alive these powerful imaging tools, by using them to create living works which touch humanity in ways not easily articulated. Artists, for the most part, are quite willing to give it a try. But the relationship is complicated by the simulation in this domain of

the techniques of the human image makers. Artists in this sense are simply the experts with the representational knowledge which is being rapidly assimilated and simulated. The mechanization of hitherto completely nonmechanistic representational skills is taking place at a rapid rate. But this is not the kind of relationship that Minsky is alluding to. I think he is holding up the position of the artist as one of the ultimate states to strive for and a state which this evolved body would make possible. However, to describe the term artist, I think it is more useful here to reflect on the overtones the term conjures up in contemporary culture — an image still informed by nineteenth century ideals such as freedom, creativity and individualism. It is the image of a person who acts directly on the environment but is independent of it, who purposely shapes the environment into a meaningful object. Implicitly, Minsky is placing the scientist in the role of an ultimate creator, a creator of the state of being an artist, a creator of a creator, the cyborg artist.

I find it difficult to reconcile this image of the artist/ machine — as the ultimately contained and independent self — with the readable and dispersed body on which it is based. This body is intimately connected at all points, functioning in a realm where freedom to create new worlds means an equal amount of intimate surveillance. It is an entity so plugged in that it is indistinguishable from its environment, challenging any notion of bodily identity that is intertwined with a sense of self.

It is exactly this challenge to conventional

notions of the self that I found most provocative when first introduced to VR in 1985. Here, it seemed to me, was a technology that creates a site to explore a body, an entity, for lack of another term, that can no longer be defined as separate. In the dynamics of its very technological and human interface, it creates a notion of a subjectivity that has little to do with the image of boundaries and perhaps more to do with an ecology of fluctuating intensities or environments of interdependent entities.

What I saw was a site to try out and try on the projects preoccupying new biology, post-modern and feminist debate, including the project of inventing images in which the body is a threshold in a continuum, rather than half of the mind/body dualism. The project of redesigning female subjectivities seemed ready to embrace an image of dispersed subjectivity, and a metaphor that functions within a web of connections, a net

of interconnections — at once artificial, abstract and perfectly operationally real.⁹

Scientific and technological projects are not necessarily inhospitable to these efforts. In practice, neither are narrowly rationalistic, both include the play of dreams, the unconscious and the imagination. Minsky dreams that we will evolve through VR to an ultimate creative state. Though he postulates a cyborg entity, he is nostalgic for the clear separation of the single, independent, willful self.

VR, in all its virtuality and simulation, is still, ironically, a material site, a technologically structured web of relationships. With these dynamics and intersections, I see the potential for reconfiguring other fictional figures.

A version of this essay appeared in *Angles of Incidence*, published by the Banff Centre for the Arts, 1993.

Notes

1. This quote from *Don Quixote* is also the title of a book by Edmund Carpenter.

2. Jonathan Crary, "Modernizing Vision," *Vision and Visuality*, ed. Hal Foster (Seattle: Bay Press, 1988).

Crary's thoughts summarized here are drawn also from *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (Boston:

MIT Press, 1990).

3. Marvin Minsky, public presentation at ARS Electronica, Lintz, Austria, 1990.

4. Ibid.

5. Ibid.

6. Quoted in Donna Haraway, "A Manifesto for Cyborgs: Science, Technology and Socialist Feminism in the 1980's," *Socialist Review* 80 (1985), 65–107.

7. George Grant, "Canadian Fate and Imperialism," *Technology and Empire* (Toronto: Anansi Press, 1969), 72.

8. Marvin Minsky, "The Future Merging of Science, Art and Psychology," *ARS Electronica* (Lintz, Austria: Festival fur Kunst, Technologie und Gesellschaft, 1990).

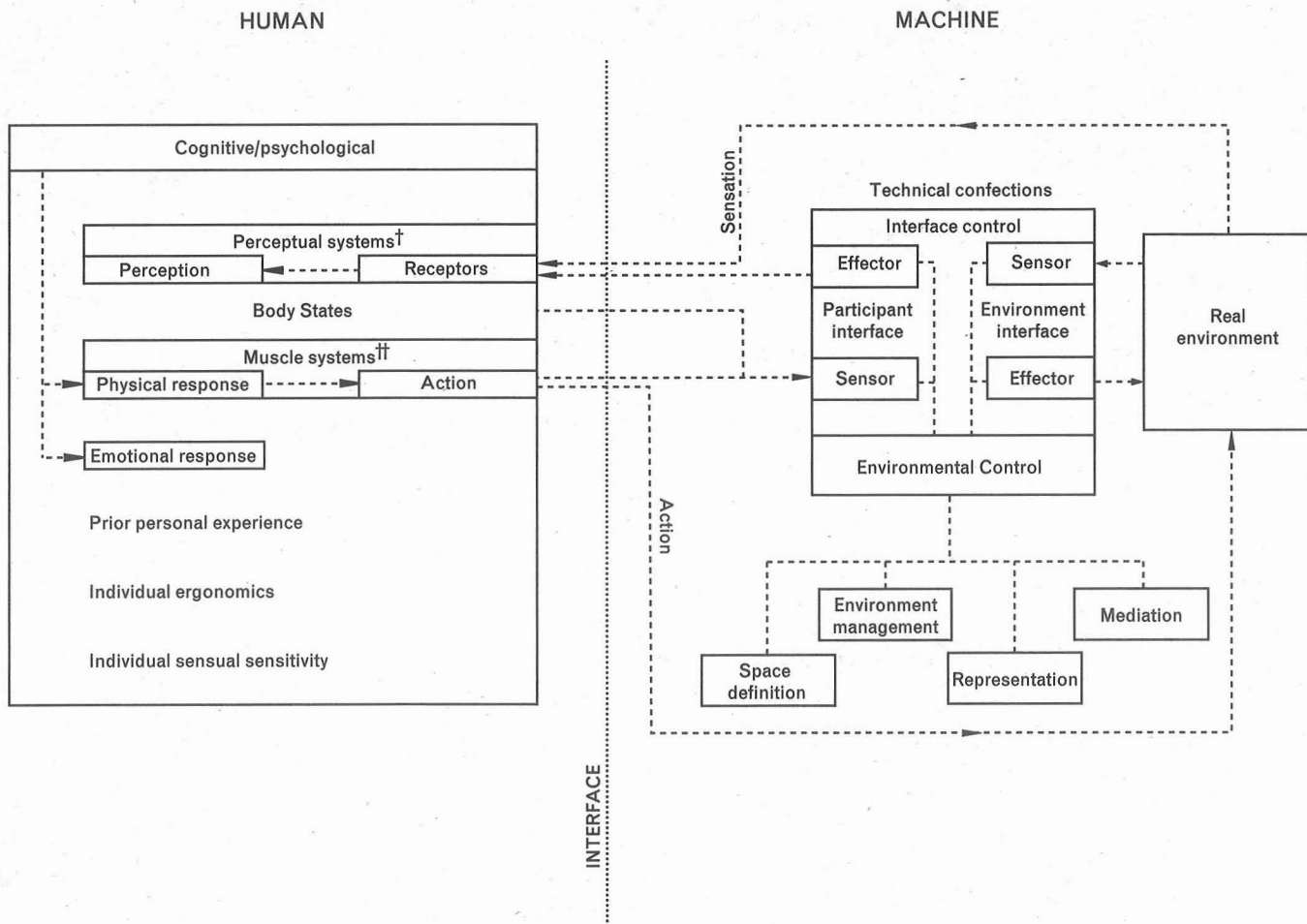
9. Rosi Braidotti, "Towards a New Nomadism: Feminist Deleuzian Tracks," unpublished paper, 1991.

objective:
to place the participant in an environment
that is not normally or easily experienced

definition:
computer-based interface to human
perceptual and muscle systems

VIRTUAL REALITY MADE SIMPLE

"the use of technology to create an environment that seems realistic"



effect (experiential):
to have a significant personal experience
while participating in an environment

effect (operational):
to perform operations while
in an environment

†Table 1. Perceptual systems.

System	Mode of activity	Receptive units	Organ anatomy	Organ activity	Stimuli	External information
Orienting	Posturing and orienting	Mechanical and gravity receptors	Vestibular organs	Body equilibrium and balance	Forces of gravity and acceleration	Direction of gravity or acceleration
Auditory	Listening	Mechanical receptors	Cochlear organs	Orienting to sounds	Vibrations in the air	Nature and location of vibratory events
Haptic	Touching	Mechanical, thermal, and kinesthetic receptors	Skin, joints, muscles, and tendons	Exploration of many kinds including appendages, skin, and tongue	Deformation of tissues, configuration of joints, stretching of muscle fibers	Contact with object surfaces and shapes, material states, solidity and viscosity, heat and cold
Taste-smell	Tasting	Chemical and mechanical receptors	Oral cavity (mouth)	Savoring	Chemistry of ingested objects	Nutritive and biochemical values
	Smelling	Chemical receptors	Nasal cavity (nose)	Sniffing	Chemistry of vapors	Nature of odors
Visual	Seeing	Photo receptors	Ocular mechanism including eyes and whole-body movement	Accommodation, pupillary adjustment, fixation, convergence, scanning	Light	Size, shape, distance, location, color, texture, and movement

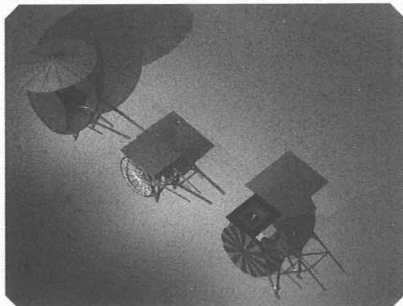
††Table 2. Muscle systems.

System	Purpose	Application	Other systems
Postural	Orientation with gravity and acceleration forces	Maintain body equilibrium	Vestibular organs
Orienting-investigating	Movement of body parts to obtain external stimulus	Sense information or explore	All other senses
Locomotor	Movement of body or body parts to other parts of environment	Go from one location to another	Orienting-investigative and postural
Appetitive	Movement of body parts to take from or give to environment	Ingest or relieve	Taste, ingestion, and other body functions
Performatory	Movement beneficial to the individual	Take action, move items, protect self	Locomotor and others
Expressive	Movement to express self, display emotion, or identify self	Make postural, facial, and vocal movements	Voice, hearing, and facial muscles
Semantic	Movements to signal action, state, or expression	Voice expression	Any other system based on signal intents

THE BEDLAM STAGE

Nomadic Multimedia
Performance Space

MATTHEW TALBOT-KELLY



The truth about the world, he said, is that anything is possible. Had you not seen it all from birth and thereby bled it of its strangeness it would appear to you for what it is, a hat trick in a medicine show, a fevered dream, a trance bepopulate with chimeras... a migratory testshow.... The Universe is no narrow thing.... even in this world more things exist without our knowledge than with it and the order in creation which you see is that which you have put there, like a string in a maze, so that you shall not lose your way.

— Cormac McCarthy, *Blood Meridian*

The Bedlam Stage is an outdoor urban theatre which is a vehicle for a non-linear form of performance. This nomadic site functions as a space of visual and aural theatre which is structured as a series of vignettes strung out along the city's fabric — rather like an urban-scaled pilgrimage or stations of the cross. The project makes use of scrim and rear projection technology (virtual animations, live video, pre-recorded and slide) in combination with audio collages and spoken word. Both live and pre-recorded signals are utilized. These elements are combined in order to achieve a flexible and expansive set of theatrical possibilities.

The visual and aural focal point of the performance is the *tower* — a flexible multi-media performance platform. The tower is a carefully articulated and flexible mobile stage. It consists of an eight by eight foot wooden platform on wheels that carries a sixteen foot high scaffold system wrapped in scrim, which is in turn hidden behind a heavy curtain. Two sides of the scrim can be opened, each pivoting from a corner, folding out to form a wider stage element. The tower will house speakers and minimal lights

and is the primary recipient of the projected images. These moving anamorphic projections provide a shifting backdrop for the actions.

The second component is the *content delivery system*, which consists of three wheeled carts from which images are projected and sounds sampled. Each cart transports a projection system and microphones which record ambient sounds of the city.

These two components might be seen as call and response (action and chorus) components. The performances take place at dusk and move through various in-between architectural sites spreadout through the city. The viewer is invited to participate in the performance by following the carts to the different locations of the stage. The sounds and images of the city itself, sampled, appropriated and collaged, are projected onto the stage set, becoming an aural and visual backdrop for the action which is being presented.

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