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Virtual BODYBUILDING

Like any other technology, virtual reality is embedded in a cultural history which lends a world view to its entire enterprise. I will argue that this world view is (not unexpectedly) male-gendered, patriarchal and Christian. In the first part of this paper I will examine the cultural context of virtual reality, before discussing some of the issues that might arise as virtual reality embeds itself into Western culture. I would like to suggest that virtual reality is culturally specific to the Graeco-Roman tradition, and is quite different to a virtual reality that might arise in a non-Western culture, if such a thing is possible.

Virtual reality in its cultural context

Self-proclaimed 'cyber-visionary' Jaron Lanier has announced that 'virtual reality is the culmination of culture'. This is a somewhat self-serving judgement given that he is a major developer and commodifier of the technology (as founder of the influential virtual reality research company, VPL). But my concern here is more with the cultural specificity of his remark. The abhorrence of the body is inherent in Christian doctrine, which has served as the basis of Western philosophy until last century. Alluquere Rosanne Stone has recently observed that in the Greek New Testament, the word *endyo* (meaning 'to put on Christ' in the sense of *putting on* an overcoat) is often used in the context of narratives about Christian conversion (quoted in Dyson & Kahn 1991).

This condition of 'putting on' is very similar to the condition of being in virtual reality. Such a suggestion strengthens the assertion that the cultural history of virtual reality is as old as Western culture itself. William Gibson's cyberpunks proclaimed that 'the body is meat', but neglected to notice just how similar their position was to that of Saint Augustine.

The developers of virtual reality have (unwittingly?) inherited a humanistic world view (an attitude to life *and* a way of making pictures) which places the eye of the viewer in a position of command – a privileged viewpoint on the world, an automation of the power dynamics of Renaissance perspective. Asian imagery offers us alternative ways of looking and of constructing pictures; medieval European imagery offers another. Television offers a third, with its multiple viewpoints and rapid cuts *which dissolve the body*. This present historical examination implicitly asks the following question: What if virtual reality had developed along pictorial principles other than those established by Renaissance humanism? Could we feel we could inhabit its space at all? In other words, how much is any so-called virtual reality dependent upon culturally acquired knowledge in order to be decipherable? Western perspective, or any system of pictorial representation, is in no sense innate, but is a convention that must be learned (often arduously). Numerous experiments in visual perception performed on non-Western people attest to the cultural specificity of our particular way of pictorially representing space, distance, relative scale etc. Reports that New Guinea highlanders were unable to 'see' or identify their own image in polaroid photographs similarly demonstrate the point that vision is profoundly influenced by learning.

What if virtual reality was developed in a culture with a different attitude to the body? In a recent article on Indian dance, the author relates:

> The sense of space was wholly different ... no long runs or soaring leaps or efforts to transform the stage into a boundless arena, a kind of metaphysical everywhere ... but content within the realm of the body, comfortable with dimension and gravity, all ease, all centred (Wetzsteon 1992, 95).

The teacher of this dance technique described the attitude towards the body: 'no sense of elevation or extension ... body self contained ... inwardness, inwardness ... *In Hinduism, there is no beyond*' [my emphasis] (Wetzsteon 1992, 95).

Compare this attitude to that inherent in virtual reality. In the real world, the sense of touch requires immediate physical contact with the object, but the eye does not. Virtual reality arms the eye, it gives the eye a hand of its own, propelled (or so it appears) by the gaze itself. The authoritative viewpoint afforded by Renaissance pictorial space is actively empowered: action at a distance. *The entire body is propelled by scopic desire.*

It should be noted in passing that I am discussing virtual reality here *as if it exists*. At the time of writing, virtual reality in the civilian domain is a rudimentary technology, as anyone who has worn a pair of eyephones will attest. That the technology is advancing rapidly is perhaps less interesting than the fact that nearly all commentators discuss it as if it was a fully realised technology. There is a desire for virtual reality in our culture that one can quite fairly characterise as a *yearning*.

Virtual reality has lingered prenatally in *Star Trek*'s Sci-Fi Holodeck for a generation or two, but now it is actually being born. It will slip frictionlessly into our lives because our culture has prepared us for it. I have suggested elsewhere (Penny 1992) that every significant development of media technology since the Renaissance has been employed to create theatres of simulation. This idea was not lost on Andre Bazin, who noted mid-century, that:

> The guiding myth ... inspiring the invention of cinema, is the accomplishment of that which dominated in a more or less vague fashion all the techniques of mechanical reproduction of reality in the nineteenth century, from photography to the phonograph, namely an integral realism, a recreation of the world in its own image, an image unburdened by the freedom of interpretation of the artist or the irreversibility of time (Bazin 1967, 21).

This 'readiness' for virtual reality has been prepared most recently by Disneyland, Hollywood, liposuction and Nintendo. Perhaps most significantly, we have come to accept that the body may be customised at will like some kind of hot-rod. This culture customises its bodies like it customises its cars. *The body is only a representation*, an external appearance, and may be adjusted to suit the taste of the owner. The absolute malleability of the virtual body is different only in degree. During early April 1992, daytime TV host Jeraldo Rivera had liposuction live on TV in front of a studio audience. Gobs of yellow fat were sucked from his buttocks and injected into his lips and around his eyes. Our attitude to the surgical customising of the flesh ('body sculpting') and to the design of the virtual body both assume and reinforce Cartesian duality by maintaining the idea of the body as pure representation. Thus virtual reality is an easy step. The body is already a representation.

How real is virtual reality? The cultural underpinnings are already in place to lubricate the general acceptance of the idea that virtual reality adequately represents 'reality'. The interchangeability of visual consumption and 'experience' (which we are encouraged to believe via television) has certainly coloured expectations of the virtual environment.

Virtual reality may be considered as a kind of 'instrumentation' of the body. For example, to wear a watch is to be 'instrumented'. When I wear a watch I am linked to a large but virtual organising grid. I can know by looking at my watch whether an office on the other side of town is closed for lunch, or whether my mother on the other side of the planet is still asleep. I can prepare my trajectory to arrive at the dentist within minutes of my appointment time. In the sense that a large social system is coordinated according to one grid system, a system which I can predict and plan with reference to it, is a virtual world of sorts.

The modern notion of how the automobile functions has informed the shape of virtual reality. Iggy Pop defined this condition in his song 'The Passenger': 'he travels under glass ... all of it is yours and mine ... so let's ride and ride and ride and ride and ride'. It is a very limited kind of interactivity: I can travel and

observe, but I cannot act. Nor can the environment act upon me. A white man driving through Chicago ghettos in a plush rental car on a hot Saturday evening with the air conditioning and the stereo on, with tinted windows and the doors automatically locked, is in virtual reality. The paradigm of stealth, of virtual reality is informed by this notion of motor car use. It is a paradigm of the powerful gaze, of monitoring while remaining undetected. It is infra-red night vision, a military intelligence model. (Why should we be surprised about that!)

We are taught to believe that we can 'experience' the countryside from inside an air-conditioned car travelling at 100 kmh. This 'belief' prepares us for the virtual reality condition. Virtual reality is as real as a picture of a toothache. It is a reality in which you can walk through walls with impunity, a reality which has no odour, and in which temperature is not very real. But to construct more and more complex and expensive interfaces for this 'reality' is to miss the point. Yet these are the kind of obsessive projects that characterise the activities of engineers in the realm of cultural production. The current debate over the 'bandwidth' of reality which is occurring in virtual reality and computer graphics circles is folly. Our preparation for virtual reality is cultural. We will accept virtual reality as a representational scheme, no matter what its verisimilitude, in the same way that we accept a map of a city or the pieces on a chess board.

Virtual reality offers a paradoxical condition with respect to our familiar art forms because it is simultaneously a picture and a bodily experience. It is a cultural experience to be consumed, at a distance as it were, by the eye. A gulf of space and time separate the viewer and the viewed, with no potential for active interplay. At the same time, it is as immediate and physically engulfing as a game of squash. This simultaneous occupation of the symbolic and the physiological realms is particularly fascinating. What kind of cultural practice can we imagine for this radically new (non)site?

The virtual body in the virtual world

What does it mean to inhabit a virtual body, and to experience a virtual environment within such a body? I want to explore the perceptual experience of inhabiting the virtual body, and to discuss the nature of cognition in such a state.

Whilst wearing eyephones and earphones, the visual and auditory world is shut out and replaced by another. This leaves one part of what we might call the sensorial body in the corporeal world, and the other in the virtual world. Can this 'body without organs' cope with such fragmentation? The mind seems to willingly close down sensory channels at odds with other more dominant channels. Problems seem to appear when the closed-down channels are reactivated. 'Simulator sickness' arises from disconnected sensory modalities. Sitting still in a flight simulator (where the image material presents the visual experience of rolling or flying) requires the mind to give preference to the visual input and to ignore the kinaesthetic information being sent from the semi-circular canals. This the mind happily does, but it takes at least 24 hours for the sense of balance to re-connect. During that time people tend to fall over a lot. As a result, the US navy prohibits the piloting of a plane within 24 hours of being in a flight simulator.

To avoid this 'split body' condition, one must simulate all sensory input in a coordinated way. We might call this 'total body representation'. It is instructive to examine what this implies. If, in virtual reality, I am confronted with a cast iron chair, a typist's chair and a lounge, I must not only be able to sit, but the sensation of texture must change. I must also be physically supported by some system. This implies a full 'force-feedback' suit which does not impede or weigh down the wearer.[1] This is clearly not feasible.

In order for a fully simulated representation of the body to be complete, the realm of the kinaesthetic and proprioceptive senses must be catered for. The internal bodily senses must be 'represented'. How can we electronically simulate the sense of a distended stomach? Sense of taste and smell are also absent from the simulated world of virtual reality. When can I eat virtual food and excrete virtual shit? Clearly no amount of external gadgetry will facilitate total body representation. For better or worse, *direct neural jacks* seem to loom on the horizon, and this technology will radically change the terms of this discussion.

The virtual reality condition that we are thus discussing is the limited case of a simulated interactive stereoscopic visual (and occasionally auditory) environment, in which the body is represented purely in visual terms. The prospect of a partial but coordinated and articulated representation of the body raises the question of the repercussions (both psychological and cultural) of a *double body*. Virtual reality replaces the body with two partial bodies: the corporeal body and an (incomplete) electronic 'body image'. In terms of the rhetoric there is no question as to which is in the ascendant. This is a kind of sensory apartheid. Virtual reality leaves the meat body on the chair. It is a confirmation of, rather than a liberation from, Cartesian dualism. Virtual reality is thus about dislocation and disassociation. Simulator sickness testifies to this dislocation — it is the first virtual illness. The body representation of virtual reality fragments the corporeal body, which becomes *a powerful eye mounted on a fractured body*.

One does not take one's body into virtual reality, one leaves it at the door. Virtual reality reinforces the Cartesian duality, replacing the experiential body with a body image, a creation of mind (as all objects in virtual reality are a product of mind). As such it is a clear continuation of the rationalist dream of the disembodied mind, part of the long Western tradition which denies the body. St Augustine is the patron saint of cyberpunks.

That virtual reality is incomplete is clear at even a cursory inspection. As a representation, virtual reality is currently an abstraction. The question is not to do with how abstract a representation the mind/body will accept as 'real'. It seems more pertinent to ask what constitutes a continuous interactive representation. What arrangement of images and interactive cues cohere in a system with syntactic order? This question is made more complex due to the confounding malleability of the mind (which William Bricken refers to as 'cognitive remodelling'). The mind, it seems, is very willing to restructure itself in order to compensate for or adapt to, a changing 'reality'.

There is a peculiar cognitive feedback loop here: virtual reality, standing in for 'reality', begins to shape the way the mind describes its experience to itself. The current state of the virtual reality image is extremely simple, built as it is from several thousand polygons. Even so, William Bricken reports that as one interacts with a virtual world, one comes to accept the polygonal representations. It becomes as valid a world as the 'real'. Virtual reality people refer to this as 'cognitive plasticity' (Rheingold 1992). Thomas Furness relates that if you spend a lot of time in virtual reality, you begin to dream in polygons! Jaron Lanier's oft-quoted adage that 'reality is what is on the other side of the senses' is validated by these reports.

The virtual reality representation is ultimately as schematic as that of a map or a chess board. These are schematic representations which are culturally learned, to which we bring meaning and from which we draw meaning. One of the techniques of virtual world design, as in other computer interface design, is to utilise familiar symbols and terminology to indicate to the user that the computer system has been modelled on a familiar 'real world' system (eg the folders and trashcan of the Macintosh interface). The learning curve is less steep because relationships to symbols are already formed. No virtual reality can exist outside of a cultural construct.

Designer body

As all objects in a virtual world are constructed, so is the body-image itself. In 'designer reality', the shape and style of the body you take into virtual reality is an open choice. One can design a body with numerous limbs (say a giant lobster) and by attaching additional sensors to the knees and elbows to control the extra limbs, one can comfortably inhabit a body with double the regular complement of limbs. The mind maps onto this new body almost effortlessly. That is, you begin to instruct your left knee to move, fully knowing that it is in fact the third foot down on the left side. In the case of the giant lobster, Lanier reports that it takes only 2-3 minutes to remap arbitrarily placed sensors as controllers for extra limbs, ie: sensors on a chin or a knee. These astonishing reports suggest that the mind can quite quickly draw a new 'internal body representation' to allow control of the new body – effectively pulling the grey matter out of one skull and dropping it into another. This effect seems to be at odds with the

traditional notion of the neurological homunculus inscribed on the brain. The arbitrary body suggests a way of understanding virtual body articulation as 'hyper-marionettry', with the homunculus functioning as a temporary map or I/O program, as opposed to 'hard-wired' circuitry.

Use of the term virtual body is often very loose and should be clarified. When we discuss the body, it seems to be in two quite different perceptual roles. We can discuss the body as a thing which is perceived, and understood to be the physical manifestation identified with the 'self'. In virtual reality this perception is purely visual and is crudely fashioned. We can also discuss the body as the thing that does the perceiving of other things outside the body. In virtual reality this perceiving is specifically visual and auditory.

Randy Walser and Eric Gullichsen have recently been quoted as saying that in cyberspace there is no need to move about in a body like the one you possess in physical reality. As you conduct more of your life and affairs in cyberspace, your conditioned notion of a unique and immutable body will give way to a far more liberated notion of 'body' as something quite disposable and, generally, limiting. You will find that some bodies work best in some conditions while others work best in others (Rheingold 1992).

This is a confusion, there is no need for a body at all in virtual reality except for narcissistic or gaming purposes. All one requires is an indication of the location of your virtual reality effectors with respect to your virtual viewpoint. As the entire physical body is represented in virtual reality by a larger and larger array of interface points, the potential diversity of one's image in virtual reality will become more limited. The variety is possible now only because you can put any shape between the image of the glove and the virtual viewpoint. Walser and Gullichsen continue: 'The ability to radically and compellingly change one's body image is bound to have a deep psychological effect, calling into question just what you consider yourself to be' (Rheingold 1992). Indeed!

From neurological research and virtual reality experimentation emerges the suggestion that our sense of self, our sense of place in the world, remains consistent and continuous purely because external reality has a certain continuity to it; that we have no internal continuous self image; that self image is volatile and only a stable 'reality' enforces a stable self image. What then are the effects of long term immersion in virtual reality, of adopting alternative bodies, and what are the effects of 'paddling' (in, out, in, out) of a variety of bodies in a variety of worlds? Could the Walser and Gullichsen experience induce a kind of schizophrenia?

The conflation of representation with kinaesthetics

One of the claims made of virtual reality is that it constitutes a liberation from the mind-body duality. It is often argued that virtual reality achieves this by side-stepping the process of translation into, and out of, symbolic representation. Lanier calls this 'post-symbolic communication'. This claim is, in my view, questionable. Lanier argues that 'the way you talk to your body doesn't use symbols' (Druckrey 1992). Fair enough. But what is then suggested to be a logical corollary does not necessarily follow: 'you can make a cup that someone else can pick up ... without ever having to use a picture or the word "cup" ... you create the experiential object "cup" rather than the symbolic object' (Druckrey 1992).

But it is not that simple. The cup in virtual reality *is* a representation – it is a stereographic image. You cannot drink out of it. But the movements of my arm to pick up the cup, and the correlation of my proprioceptive perception of my arm moving with the image of a hand moving towards the cup, *are* bodily experiences.

Handing someone a virtual cup, resolves the mind/body duality, *not* because the virtual cup bypasses the symbolic, but because the wilful action 'passing the cup' is made. Motor action occurs as a result of will; the real arm moves the representation of the cup; the arm is moving both within virtual reality and without; the realm of representation and physiology are conflated. This is the paradoxical condition of virtual reality.

William Bricken maintains that all the operations of symbolic logic can be performed in virtual reality without recourse to symbolic languages, that logic is equivalent to inference in visual programming. Set theory, number theory, and algebra can all be represented as

objects in space, these systems of objects constitute mathematically rigorous systems. Binary logic can be represented as open and shut doors, and knot theory as fish swimming upstream over dams. 'All computation is algebraic pattern matching and substitution (proven)' (Bricken 1991).

There is clearly a paradigm shift in the virtual reality experience, but it *does not* bypass the symbolic and replace it with an experience that is indistinguishable from corporeal experience. The virtual reality representation is an interactive stereographic representation, an automation of pictorial representation. The appellation 'virtual reality' is unfortunate, as it makes the same sort of untenable claims for the technology that the term artificial intelligence did for that discipline. I would prefer to discuss virtual reality as a special augmented case of visual representation, such that the object is simultaneously a representation and an experiential phenomenon. Virtual reality directly 'interfaces' kinaesthetically with the body, bypassing textual and oral language. But it remains a pictorial representation and is thus subject to critical analysis. What is required is a new critique, a way of thinking about the meeting point between the immediate physiological reality of the body as lived-in, and culturally-specific conventions of representation.

Conclusion

The ideas that have constructed virtual reality are not new but have deep roots in our culture. It is therefore important to bring a cultural critique to the realm of virtual reality. Historically, technological development projects have been considered by their developers as being discontinuous with the world of everyday experience. Virtual realities must not be considered in this way, nor should the developers of these environments be encouraged to think in such a way. It is the fabric of everyday culture that lends and confines meaning in these virtual worlds. The developers and their worlds are immersed in, and informed by, the contemporary culture which is itself informed by cultural history.

Endnotes

1. Force-feedback is the term used for technologies that effect the illusion that virtual objects have some physical mass.

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