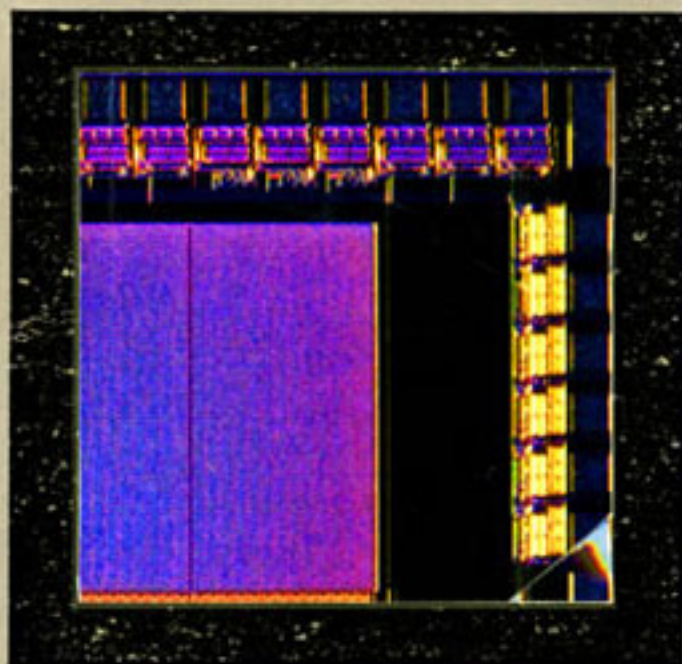# Through the Looking Glass:

ARTISTS' FIRST ENCOUNTERS WITH

VIRTUAL REALITY

EDITED BY JANINE CIRINCIONE AND BRIAN D'AMATO

THROUGH THE LOOKING GLASS:
ARTISTS' FIRST ENCOUNTERS WITH VIRTUAL REALITY

Curated by Janine Cirincione

Jack Tilton Gallery
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Cover: INTEL i486 Microprocessor, 1.2 million transistors, detail.

NOTE

All the contributors to this catalogue were asked to focus directly on the question, 'What types of cultural futures should we create with digital technology -- specifically, virtual reality?' We hope that the material here will be both critical of the problems of digitalization and, more importantly, creative of liberating solutions to those problems.

-- JC&BD

CONTRIBUTORS:

Janine Cirincione is Director of the Jack Tilton Gallery and curator of *Through the Looking Glass: Artists' First Encounters with Virtual Reality*. Other curatorial projects include *Detritus*, *Forbidden Games*, *When Objects Dream and Talk in their Sleep*, and *Dark Decor*, with Tina Potter, for Independent Curators, Inc. She is currently co-curating a photography exhibition with Gregory Crewdson for the BlumHelman gallery.   She is co-founder of Softworlds Studios, a think-tank for the development of software-based editions and electronic publishing, with Brian D'Amato and Michael Spertus.

Brian D'Amato is an artist, novelist and critic whose most recent feature was 'The Last Medium,' a piece on virtual reality, in *Flash Art*. He is currently exhibiting work at the Jack Tilton Gallery and at the Wexner Center. His first novel, *Beauty*, will be published in October 1992 by Delacorte. He is working on *The Sacrifice Game* -- a video game for Softworlds -- and on a second novel.

Peter Halley is an artist and theorist who lives in New York. A traveling retrospective exhibition of his work is now in Madrid.

Donna Haraway teaches in the History of Consciousness program at the University of California at Santa Cruz. She has written extensively on the sociocultural implications of new technologies. Her books include *Primate Visions* and *Simians, Cyborgs, and Women*.

Jenny Holzer is an artist and writer who lives in New York. In 1991 she represented the United States at the Venice Biennale and received the Golden Lion.

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Jaron Lanier is a musician, artist, and interactivist who co-founded VPL Research Corporation and who coined the term 'virtual reality.'

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Simon Penny builds interactive electro-mechanical installations. He created the Electronic Intermedia program at the University of Florida, Gainesville, and is ArtShow chair for Siggraph '93, an exhibition that will be exclusively interactive and/or virtual.

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ACKNOWLEDGEMENTS:

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CURATORIAL STATEMENT

Janine Cirincione

Through the Looking Glass: Artists' First Encounters with Virtual Reality introduces the work of a group of artists whose works explore the potential of VR as an aesthetic medium: Brian D'Amato, William Gibson/Dennis Asbaugh, Michael Joaquin Grey/Randolph Huff, Lynn Hershman/Sara Roberts, David Johnson, Myron Krueger, Jaron Lanier, Matt Mullican, Nicole Stenger, and David Wilson.

As the title suggests, this exhibition is more of a sketchbook or 'projects' show than a definitive statement on the current applications of VR. Although access to advanced VR equipment has so far been limited, the artists in this exhibition have begun to explore, in a variety of media -- both high- and low-tech -- some of the questions the new technology raises. Interactivity, computer generated imagery, and artificial or simulated realities are presented here in a format that encourages speculation. How will artists use advanced technology in the near future, as it becomes more affordable and accessible? What kinds of virtual worlds will artists build? How will networked interactivity influence the ways in which we relate to each other? How will artists humanize technological media to go beyond the seduction of the machine into the poetic? And finally, what value will we place on the role of objective reality when illusion becomes more credible and fiction more 'real'?

Recent breakthroughs in digital media are already significantly impacting our culture. While the conventional wisdom is that most earlier attempts to bring together art and technology have failed -- unless

you count, say, cinema -- many people feel VR may offer almost unlimited expressive potential. Within the next few years we will see remarkable art projects created and presented through fully immersive 'goggles-and-gloves' systems. What effect this will have on art and the real world remains to be seen...

ABSTRACT SPACE

Peter Halley

"In the future, you'll be able to go to a party and be the only one there."

-- Andy Warhol

I can think of two interesting things about virtual reality. First of all, as your project implies, it has the potential for making a truly abstract space. This is the whole idea that an abstract environment can become three-dimensional or experienced. This sounds somewhat illustrative, but if you imagine someone like Rothko, who wanted to depict a certain type of space or type of atmosphere, and who had to do it as simply as making a painting, the idea that you could have a kind of walk-in Rothko seems kind of interesting. And for me the idea of a purely geometricised space is interesting. And I think the other thing that comes into play that is interesting is related to what we were saying before about architecture in malls. But I actually think the real architecture today is the architecture in the movies. That if you have to build something, to make it stand up and serve a purpose and so on, there are so many physical and financial limitations in terms of the use of the thing, in contrast to the movies, when something is being built just to photograph it, just to show it in a scene, as in *Blade Runner* or *Batman* or whatever. That to me has become the real architectural space. I guess virtual reality has the possibility of extending that.

The other thing that has been a big concern to me, and that I don't think that people talk about very much, and this gets into

animation. I think that right from the 20s and 30s that there are things going on in animation and animated movies. For example, if you think about Mickey Mouse or Road Runner, when an animal will be poked through a little hole in the ground, or when an animal is flattened by a rock and gets up again, or in Road Runner all the things that happen with speed and movement, that those things are a very interesting reflection of how we think in terms of space and matter. I think they represent very interesting psychological concerns. If you think of our culture or our society as very crazy, in which you could think of yourself as being flattened one day, like the character that rock falls on and gets up again.

You were saying that you had this project for a game in which somebody can get themselves killed as much as possible. The other thing about animation which would extend to virtual reality is that whole experience of having a character pulled through a tiny hole, and then stretch out again. It is something that can't happen in real space, only in that filmic or animation space.

It seems that you have been mostly concerned about spacial situations and architecture, etc., etc., and actually most of the people who are working with this stuff tend to be oriented towards physical sensation. Ever since the 60s in science fiction people have been writing about psychological virtual realities in which there will be a whole cast of characters that you could encounter as well. That, I think, is interesting and troubling.

In your idea of the social VR space, where you can float around and meet people, when you say things like "float around," or "get yourself killed eight times," I guess that one of the impetuses for people who seem to be enthusiastic about VR is that it might be a space in which you can imagine that the real laws that govern movement and your body can be transgressed. In that sense it is kind of a romantic space. But what interests me the most is just the opposite, that video games and virtual reality have been used so much to just reproduce things that are already out there in the real world. So it seems that in lieu of a physical

experience of driving a car, or flying over a mountain range, people get more of a kick out of doing it in an imaginary space. It is almost as if the power of a computer to replicate nature becomes part of the appeal. To my mind it's as if not only have we become encapsulated and isolated, but we want to do so further, whether it be through a hallucinogenic virtual reality experience or some other way. That you're isolated in this narcissistic, cocoon-like space, where all the external stimuli are chimera or simulations, is very interesting. If you think about the beginning of the use of hallucinogenic drugs in the 1960s -- which basically had the same impulse, to distort space and time and to confuse the difference between reality and what is imagined -- you wonder if it doesn't represent part of the larger impulse of the culture. Beyond the problems of drugs for the disenfranchised -- and even with that to some extent -- it's almost as if the culture has become so schizophrenic, and cause and effect in the culture have become so strange, that it's almost as if since the 1960's a culture has been created where people have wanted to use drugs in order to come to terms with the schizophrenia and lack of cause and effect in the culture, as a means of coping with it or mastering it or reenacting it or whatever, and in response to that authority has tried to put a lid on it.

The whole cut-and-paste character of the culture that is given to people -- you can see whatever grisly news footage and then the next ad that will come on TV is some sexually tantalizing ad for something -- is very schizophrenic. And if you're in New York in the morning and Los Angeles in the afternoon, that's a kind of spatial schizophrenia that I think people are unconsciously trying to cope with.

My theory, and this is sort of a standard view, is that tribal peoples and preindustrial peoples had that same sort of schizophrenic experience of culture, and that it's only with the Enlightenment or with the Industrial Revolution that people tried to assemble consciousness or cause and effect into a unified whole. And I always talk about the period since 1960 as the end of the Enlightenment, the end of the Age of Reason, when drugs came into popular usage.

The media, too, has become increasingly surreal, especially in the last five or ten years when fantasy movies have become the dominant form. And even if you talk about movies about violence and murder and death, almost as in religion, it's blown up onto such a cartoon-like scale. Even in New York City, most of us don't live in a world where a hundred people get blown away by a machine gun in an afternoon.

Virillo's *War and Cinema* ties together the development of cinematic technology in the 20th century with military technology. In a way VR takes it a step further. The genesis of virtual reality technology was in the military, And I guess the first impulse was to save gas. Instead of sending some fellow up to fly around for four days, he could just sit in a simulator. Secondly, if you think of it as a deadening device, when a military pilot would be trained in a simulator, and crash several times or shoot down a hundred planes, it would seem that it would be an inoculation against the reality of the situation. They must get confused as to whether they're still in their simulator or actually flying.

That's another big issue, the mechanization of the body. In a virtual reality gear or rig, the person becomes a robot to some extent.

This gets back to the idea of the abstract space. If you take a hallucinogen or an opiate or even marijuana, the idea is to get into an abstract space where you see colors and patterns and so on. I guess this is a similar impulse in a way. You really can only see the interest in this in terms of larger events going on in the culture, like the space of the shopping mall, other changes in telecommunications, what's going on with the media, what's going on with media in politics, and so on.

But from the artistic point of view, if you think of generating architecture in a traditional sense, but doing it from some sort of virtual-reality experience, that would be awfully interesting.

I visited the Wexner Center a few months ago. I really, really love that building. I think it's the most significant building I have seen for the last ten years. Somebody told me that Eisenman had started using computers very early. I really felt that space could only have been

generated with computers. It is the first space I have ever been where you felt that; that it was too complex to have been worked out any other way.

Somebody also told me that Stella also used computers to plan a lot of his work in the mid-80's and there as well there's a spatial complexity that also relates to how many elements you can get together on a graphics computer.

For years I have wanted to make a video tape in which you would travel through some kind of pure Cartesian abstract space. I guess for me, the idea of making a pure space like the one in *Tron*, except better resolved and something that you could travel through, is what I would work on.

For me the whole point of working with computers and computer graphics is to achieve a space that is a representation of the hyper-Cartesian space of the computer itself. So basically the ultimate virtual reality space for me, or the ultimate computer-generated animation, would basically be a kind of representation of the current running through the microprocessors. Of course, the current changes with the content of the program. I'm not saying that it's simple or reductivist, but simply that the workings of the machine also have a space of themselves that according to my definition, is the basic space of our culture.

So using a computer to represent its own space is interesting to me. I think its space is capable of a lot of ambiguity, but I do think that it has locked itself into being something, in terms of the fact of how computers work. The electric current is either off or on, through a whole series of Cartesian decisions. The idea that it would transcend itself is appealing, but I don't think that represents basic change in the nature of the space.

(Note: this essay was compiled and edited by Brian D'Amato from an interview with Peter Halley.)

THE MATERIALITY OF INFORMATION

Donna Haraway

One of the things that strikes me most about VR at the present is the extraordinary gap between the *descriptions* of what VR will provide and the actual technology and people's experiences of it to date.

The first time I actually experienced VR was in University of Washington research laboratory, behind a locked door. It was like walking into a vault of some kind, with a kind of anti-chamber with public-demonstration type stuff. Then, behind a *very* locked door, in a building that looked very much like a prison, with padlocks and other safeguards, a very peculiarly enclosed and security- conscious environment which mocks you as you go inside.

Then you're in a lab group with folks that look like yourself, with jeans and sweatshirts, mostly white and some Asian, working on work-stations with a technology that is obviously extremely interesting. But at this moment the goggles and data-gloves in fact provide an experience that is considerably less powerful than, for instance, those Naturemax films at a good science museum, where there's the incredible capacity of cinema to compel a kind of immersion in a world where you aren't. I think at this point the extraordinary visual apparatus of ordinary cinema is vastly more powerful in constructing subjectivity and subject positions than anything that VR can do now.

But I had thought VR was very different from that. If you read the advertising in *Chemical* magazine or look at the latest *Omni* or *Mondo 2000* article, you get the impression that VR is already the answer to the power of ten. I think that social fact, the gap between what in fact VR

workers can produce and the VR image that is already in play in the media needs attention.

Now, this often happens with new technologies. A lot of times the claims are unfulfilled. Think about nuclear technology, for example -- the promise of the Atom for Peace Program, the promise of energy without limit and without dirt, infinitely abundant and totally clean... I think technologies sometimes deliver and oftentimes don't. I think that the effectivity is ideological and imaginative as much as it is material. I think VR technology is *already* delivering at the level of its construction of both popular and technical consciousness, irrespective of whether it ever delivers in terms of actually becoming a powerful research environment or a powerful artistic medium. Whether or not it ever surpasses the power of movies is a separate question, I think, from its effectivity in the production of a kind of socially inhabited world that is itself a material reality. In that sense nuclear power never delivered clean, infinite energy, but it certainly delivered changed ways of daily life. The nuclear promise effected new kinds of lives and different kinds of pain and pleasure, partly because of its imaginative effectivity: it transformed what people assumed was legitimate, possible, or painful. If you think of the practically billions of dollars that were invested in the nuclear industry on that promise, not to mention the extraordinary transformation of the land where nuclear plants were implanted, the transformation of social systems and the relative power of urban, to state, to national agencies: the huge social transformations rooted in that promise, irrespective of whether it delivered. The delivering is in a way a part of the way technologies operate as socio-technical systems. Like the gap in VR: it isn't whether it delivers or not, but what's going on socially, in comparison with something like the nuclear promise. There's one branch of interest which is a kind of skeptical curiosity analogous to the extraordinary hype -- a hype which is none the less not empty, even if it is hype. So as a modestly skeptical, modestly techno-literate person, going into the VR research lab for a public demonstration, I expected more. I was, however, quite impressed by the potential sex-equality of

the thing. Now, at present, if you think of research environments where really powerful graphics programs are operating, they aren't really VR technologies: they're two-dimensional screens that produce a three-dimensional effect. For the most part, they aren't at present multi-media or multi-sensory. What VR promises is the ability to take a human body and make multi-media and multi-sensory presentations with real-time feedback, so that you don't have the gap that disrupts the reality effect. So that enormous amounts of data, that can't be handled by a single-sensory system through the visual, can be processed by an ordinary person. At the same time, you can produce a particular kind of "Alice in Wonderland" effect: a scaling issue, so that you can become very large or very small, and either inhabit a world at a different sense of scale, or surround a world.

The promise of VR is to produce a different set of conventions. You can think of reality, in a non-trivial way, as a conventional effect: certain kinds of reading and behavioral practices that are widely shared collectively produce a certain agreement: that such and such is "realistic." For example, think about the history of painting and the very particular kind of conventions that go into the shared agreement that such-and-such is a realistic painting, or that such-and-such writing practice is realism.

Anybody schooled in either the history of art or the history of science or any such thing understands that what counts as realism is conventionally produced in very material ways. VR is the same thing. What is going to count as a virtual reality is something you'll have to learn to experience. It's like the history of perspective in painting. You don't know how to do it, you literally don't know how to experience it: it's like smoking grass the first time. You don't know how to have a drug effect. And you don't know how to have a virtual reality effect, until, as with painting, you've figured out the conventions of linear perspective or whatever else. Also, like painting conventions in early modern Europe or the Renaissance, VR is involved in a whole major mutation in knowledge production. It produces different kinds of personal aesthetic effectivities as part of a very broad cultural mutation

in what counts as knowledge.

This kind of knowledge or convention will be an extension of the video-game and computer sensibility that is already present in the younger generation, so on one level, it's nothing new in principle, but it is very much something new as a particular historical practice. As with other historical practices, there's a whole generation of folk with a common sense different from that of the just previous generation. So although in principle that's not new, in practice, the specifics that are happening are very new. There's a graduate student who's been studying Herman Kahn and the Rand Corporation in the 1950's, and has been asking how it happened in practice that significant numbers of people began to regard scenario production -- the production of plausible (and implausible) but possible worlds -- as a technically important activity. In the same way strategic defense planning began as a social practice that was massively invested in. It was a mutation in scientific and bureaucratic practice. And simulation technology, the net computers and the multi-media, multi-sensory VR technologies, are pretty straightforward developments of this apparatus of production of possible worlds.

None of the high-speed trains and everything the Rand corporation postulated ever happened. But something doesn't have to happen to be effective, that wasn't the point. The point is, the common sense of the production of possible worlds became something everybody now takes for granted.   This common sense of habiting scenarios is historically very recent, and very much a material product of the Cold War. I think that the defense practice preceded entertainment practice and preceded chemical scientific research. Right now, maybe one of the biggest social interests in these technologies, aside from the ongoing interests of the military, which is huge, is the chemical industry; the pharmaceutical in particular, because national drug design is a very big matter. They have the nicest software; some of the biggest money rides on this stuff in pharmaceutical areas. I would like to see figures that compare social investment in the entertainment industry, the chemical

industry, and in military research. These are *big* institutionalized social practices.

Then there are the business applications -- simulated trades, simulated production and distribution in various economies. It's the whole question of productary management by middle-management, working with amounts of data that you would like to be able to visualize. But how do you visualize some phenomenon that has ten variables operating simultaneously? How you visualize clusters of probabilities and manipulate them? A lot of the programming is, it seems to me, an effort to produce those kinds of experiences, experiences that are meaningful at a primate interface, and that allow instrumental action in those environments, so that people can have not just the illusion but the fact of effectively operating in environments of that kind of complexity. And to that extent it does deliver. No pharmaceutical company could stay in business now without computer-aided drug design. Those companies that have the most advanced technologies for computational experimentation will surely be the ones that command the markets. Guillaume LaToure, who's a French science-studies person once described a laboratory as a machine for making mistakes faster than anybody else can: a machine for making meaningful mistakes. You can think of these technologies as immensely increasing the speed at which interesting mistakes can be made.

Rational thought has always been simulation to a degree. If you take it back to the history of perspective, realistic painting, for instance, is certainly a synthetic world. Again, in principle I don't think there is anything different going on, but there is certainly something different going on in terms of the scope and speed and particular social groups that are involved. It's a little bit, again, like thinking about cinema or television. On the one hand, that visual culture is hardly new; on the other hand, the power of the cinematic apparatus to position viewers really is different. It depends whether you're looking for the continuities or looking for the breaks. But the breaks matter: you re-configure major issues, like gender.

One site of the gender issue is in role-playing, taking the scenario that this technology does deliver what it says it will. Of course, the first issue is, who participates in the fantasy? The programmers, the designers of VR, are going to have a sense of extraordinary agency in all parts of the world. One of the projects that I am taking on next is getting together a lot of the earth-simulation games and teaching programs and trying to produce a sort of a multi-pronged study on what kind of subject positions are made available for home users in the kind of orthopedic practice of playing those games, looking at orthopedic practice in a sense of turning up certain kinds of agencies, rather than others. In the way that straightening your teeth is orthodontic. But I'm thinking of those games, and the teaching packages coming into biology teaching, which are also very similar, as the construction of certain kinds of subject positions that you can come to inhabit.

And the power issues are so overwhelmingly obvious. On the one hand, who has access to that sense of freedom and agency in the world, and under what conditions you get access to it. I don't think there is much question that there are inequalities of national power, gender power, and racial/class power; but these things produce new forms of inequality and deepen old forms of inequality, while maybe alleviating some. This is partly an empirical question and partly not. The question -- which kinds of inequality, for whom, are built into these practices -- seems to be one that absolutely has to be foregrounded. But in fact, if you watch the popular culture around these technologies, it's not only not foregrounded, it's almost unaskable -- or if it is asked, it's asked as an afterthought or to the side. It's not some kind of simple-minded issue like, "only white boys get power."

In these games, it's as though you're controlling these populations and things from a kind of Godlike perspective. In some ways it deepens the most deadly illusions of Western culture, those of a kind of monotheistic, God-like creative agency: "What happens if I modify that variable or I shift things over here..." Treating worlds like that has been, I think, destructive at breathtaking levels. I don't feel especially

optimistic, frankly. I feel like these are the forms of agency that have been most responsible for some of the most rapacious cultural moves in history.

That is not all I see, but to deny it seems to me part of an American technophilic optimism that I don't want any part of.

On the other hand, these games are basically just extending that level of play, the possibility of creating these simulations, to the general public, whereas before it was only in the hands of the military, or other experts. And when they're in the hands of the experts, these things exceed themselves. They always exceed the purposes, origins and starting points. Just as you'd be a fool to deny that television as a technology of surveillance and domination. I think what I want us (whoever that is) to do is to keep the contradictions alive and not go for one or another of their terms. With these technologies, we shouldn't let ourselves forget -- and the temptations to forget are very strong -- the conditions of access: "With whose blood are my eyes crafted?" What kind of inequality and for whom am I being persuaded into? Those questions about power aren't relegated to the social. At the same time, there are various ways to demonizing this and every technology. We should ask seriously, "Okay, what kinds of possibilities and for whom?"

Can these technologies be prosthetic devices for building connections? What kinds of connectivity can be established here with people? There are imperializing ways of relating to the kind of heterogeneity and difference in the world, and there are also perhaps ways of asking questions about possible connections that de-center your own overdetermined cultural power. Can these technologies be part of producing social agencies in first world cultures that are less imperializing? If so, how? Can technologies like teleconferencing train people to be somewhat more modest, as opposed to more God-like? Can the assimilation programs train people up to a sense of fallibility and modesty? I think the answer is yes, but I don't think people are spending a lot of money trying to do that. There's no reason in principle that the pleasure of understanding the specificity and limitation of your position

couldn't be just as powerful as the imperializing pleasure. I don't think that there's anything in human nature that makes imperialism nicer than understanding your specificity and limitations.

My hope for these two technologies, which frankly is a little tiny hope, overwhelmed by a fair amount of skepticism, is that they can be part of growing practices of consciousness of limited connection and modest ways of operating in the world; that the power, the visual and sensory power of the technology, can be a way of dramatizing the relativity of our place in the world, and not illusions of total power.

Digitalized technologies are real materials of a different kind. I'm interested in foregrounding the materiality of information, not the immateriality. I think the way we have set up the binaries says that information stands for the light, the airy and immaterial, and that's a mistake: Information is no less material than steel.

(Note: this essay was edited by Brian D'Amato from an interview with Donna Haraway, who spoke by telephone from Oslo.)

ACTIVITY CAN BE OVERRATED

Jenny Holzer

Janine Cirincione: I understand you're about to begin work on a virtual-reality project. How will you use this new medium?

JH: I'd like to do some worlds that use my writing, but the texts would be heard rather than seen. You'll go to various points in a world and hear statements when you penetrate a wall or grab an object. I like the idea of sound coming from different places. You'd have the option of going to one corner and hearing something there, or moving to an opposite corner and getting different information. I'll probably use my new war writing and a mix of earlier material. There might be worlds in flames; there will be bad worlds and good worlds. The other thing I may do is set it up so that at times your controls are unresponsive. Regardless of where you're pointing, you spin and tumble. Then it will be like the real world.

JC: VR is such a seductive medium in terms of its visual potential. How would you incorporate the computer's graphic capabilities into your work?

JH: The main thing that interests me is the content of the texts and the disorientation that occurs when your controls don't work the way they should. I haven't quite figured out how my worlds will look. There are so many possibilities. I'm so used to working with the electronic sign boards, so it's overwhelming to be confronted with the array of VR options. One thing I do want to explore is what happens when you fly through a floor and see a mirror world.

JC: VR presents some interesting architectural possibilities since computer-generated models don't have to be practical or even buildable. I wonder if we'll be seeing new kinds of architectural models and forms, specifically a more feminist architectural language.

JH: I'm torn between concentrating on the functional -- like going from one room to another in an imaginable, or unimaginable/unbuildable structure -- or to fabricate a kind of mock-nature in which you would be flying across a plain or a heavily wooded area or an ocean or whatever. It's an interesting idea to be honest about the fact that VR isn't real, and make imagery or spaces that would be utopian, impossible in the regular world.

JC: Do you see this as a utopian medium? Many people are afraid of the ways in which VR technology might allow for greater surveillance of our activities and thoughts. It's already being used as a sophisticated marketing tool.

JH: I was using utopian in that it could show you things that do not yet exist on this earth. The medium itself will be what people make of it. Because a number of horrible people will use it, we'll see horrible things. I'm sure some good people will work with it and we'll see amazing results. Most inventions are neutral or potentially wonderful until people start using them. VR will be as good or bad as people.

JC: Jaron Lanier once said that he believes VR will do away with the need for spoken and written language because in a virtual world everything will be infinitely actable, demonstrable or communicable in a way that would preclude the need for language.

JH: I read that and thought it an extremely interesting remark. It seems that culture at large is going that way anyway. The Diet Pepsi

commercial, the 'Uh-Huh,' is representative of the state of language, but I don't think that language is going to be killed soon, or that there is something in virtual reality that is its death knell. Often people aren't as concerned with doing something as they are with talking about it. Activity can be overrated. A lot of times people just want to jabber.

JC: One application for virtual-reality technology that goes beyond entertainment or aesthetic experience is in the area of global networking and multi-access to large data-bases of information. The ability to access vast networks of information instantaneously via home VR networked systems must be very interesting to you.

JH: I think instantly available information could be one of the most important aspects of VR, and the ability to have shared experiences is particularly interesting. We have Ross Perot's instant polling of the American public -- instantaneous information already has a great impact on our lives. Beyond that, VR offers a way that many people can experience, can feel the same things. That could be quite wonderful.

JC: It may be amazing, but it'll be just another way in which certain people will have access to or be denied certain information. The same conditions that exist today in the real world will probably operate in virtual worlds.

JH: I'm sure that information still will be stored away for the use and delectation of the Big people.

JC: There are not very many women involved in this field yet. One concern that we all have is, who will have access to this technology? It will likely be the same people that have had access to other forms of expression and broadcast media.

JH: That is unfortunate. There are certainly more computer guys, but

someone like Brenda Laurel is doing a great job of representing herself and the sex.

JC: Let's get back to the idea of interactivity for a minute. You mentioned earlier that one way you would like to really engage this medium is to thwart people's expectations of how they can interact with your worlds. In your current work you use language in a critical way, to question our belief in an objective, authoritarian voice. Should we expect that you will use this medium to subvert itself as well?

JH: Not so much to subvert itself, but to represent the way the world at large works, and the ways in which we routinely shoot ourselves in the feet, or are shot by other people. I'm not so interested in self-referential critiques because I think that it's better to aim at the larger world. I've always thought it limited and perhaps not even honest to criticize while safely within a discipline, to pretend that it's the only thing that you can and should do. I think you ought to go after bigger game.

JC: Do you think this technology will allow you access to bigger game, and to a greater audience? Current corporate development policy is gearing up to have VR in the home within the next few years, and unfortunately, very few artists have had a similar kind of access to the public. With a few exceptions artists tend not to break through to the general public. Do you think VR will allow you to get beyond the confines of the art world?

JH: Not any more so than by working with a number of other public media, but I think working with VR gives you a prayer of keeping up with what will be in everyone's house, of getting some kind of toe-hold, and of having some impact into what VR will become.

JC: I think it's important that artists are beginning to work with this technology. It has such great expressive potential, and it would be

criminal to see it used exclusively for mediocre entertainment.

JH: I suspect that the scientists are going to do astonishing things VR both for good and evil -- things that will have a great impact on the world. But you're right, on the soft side, unless people concentrate, it will just be virtual dildonics and the Brady Bunch in Virtual Reality Land.

JC: I can see a future in which people would jack in to play with Mickey Mouse.

JH: Or worse.

JC: Yes, it could be worse. Playing with Mickey would be harmless fun, but not all that interesting in the long run. What kind of an impact do you think VR is going to have on our culture at large?

JH: VR could be the biggest thing since the aforementioned Mickey Mouse. I know this is the standard whine, but it would be nice if it's useful, not harmful, and fertile ground for great thinking and doing. Like any other new medium, printing, photography, video or whatever, VR is *potentially* important and it becomes everyone's responsibility to imagine what it can do, and then make it something miraculous.

THE ART OF REALITY

Myron Krueger

In an artificial reality, what you perceive is a response to what you do. Ideally, you enter a completely convincing world experienced through all your senses and with your entire body. A realistic world is only one of the options, for the laws of cause and effect can be composed from moment to moment. In such a facility, any imaginable fantasy can be delivered. It would at once be a practical tool, the ultimate Skinner Box, and a powerful new aesthetic medium. The idea works. The technology is just beginning to. It is where film was in the beginning of the century.

C.P. Snow noted that our society was divided into two cultures, one humanistic and the other technological. One is focussed on the past and the other looks to the future. Artists and intellectuals have been assumed to be in the former group with scientists, businessmen, and engineers assigned to the latter. The moral high ground was, of course, the province of the former. Truth lay in the past, error in the present, and disaster in the future.

The idea that art and technology are antithetical is a recent invention. In the past, artists typically used the most powerful means available to express themselves. Painting in the stone age, lost wax casting in ancient Greece, and glass blowing in Rome were all high tech. Indeed, artists always use technology. It is just that today, the technology of the traditional arts is obsolete. The fact that the media of the Renaissance are still considered appropriate today is almost quaint. It is as if the Society for Creative Anachronism had taken over the art

world.

For 20,000 years, painting was the most effective means of illustration. However, painting is a technology with a set of limitations that no one thought to complain about when they were impossible to overcome. Indeed, when faced with media that offer an answer to the tyranny of static representation, the traditionalist will make a virtue out of a vice. Consider the following thought experiment: if the cave painters had been offered animated paint, would they have used it? I think there is little reason to doubt that they would have preferred to animate the creatures they depicted.

Similarly, the limitations of painting have made us think that we see in pictures. In fact, we are incapable of seeing pictures as a whole. Seeing is itself a physical behavior. The eyes never stop moving, and we often move our bodies in order to see better. This aspect of perception -- of representation -- cannot be addressed with traditional media.

In the past, when men toiled physically, the worlds of art and the intellect were, by contrast, experienced from the neck up. The technology of paper and pencil required humanity to sit down to use it. The printing press robbed the book of its colorful past, when a scribe could labor for a year on the illustration of a single page. Instead, Gutenberg created the black-and-white, sensory-deprivation world of the intellect. Similarly, the role of the body in experience was denied in the arts, because the technology available worked better for passive viewers and offered little in response to an observer's movements. Thus, while your view of a sculpture changed as you moved around it, the changes were entirely predictable.

Until recently, humanity could only afford a few aesthetic specialists who could dedicate their time to expressing themselves for the rest of us. But one consequence of this practice was that it elevated the artist. Their work said, "I am an artist -- and you are not." Thus, art like football, is a spectator sport with its own celebrities. And so, the aesthetic sense that we are all born with is suppressed as we discover that some of us are better at drawing that others, that some of us can sing but

others cannot, that some of us are graceful while others are clumsy, and that some of us have manual dexterity that others lack. In art, as in sports and education, we merely select the gifted or the privileged rather than improving the capabilities of each individual.

Now, however, the world of physical labor has all but disappeared. Our labor saving devices have not only eliminated exertion from our lives, they have ironically made it necessary for us to get exercise on our own time when we are not paid for it. Thus, there may be a place for physical exertion in the arts.

Indeed, there are many trends related to artificial realities. Scientists who used to understand the world through mathematical equations, now visualize the implications of their theories in animated three-dimensional simulations. Businessmen expect to use multimedia presentations to pep up mundane information. The most prosaic activities are starting to take on an aesthetic aspect.

In addition, the distinctions among the various art forms are less rigid than they once were. New electronic media are continually invented that will blur the boundaries even further as they created new categories. When the dust settles, one wonders whether there will be a single electronic super-medium that is used for every purpose. This would permit these previously discrete activities to be mixed and matched like a child's book that combines the bodies of different animals. Business executives could use beautiful visual experiences to help them learn Japanese while they work out. Or, handicapped children might use musical experiences to motivate their movements during range-of-motion therapy.

Artificial reality is the meeting ground for these various forces. It is the focus of a cultural implosion which is well underway. It adds the ingredient of interactivity to the media that already exist. This is important, because temporal media such as film are static in their own way. Interactivity is not new to the arts in that musicians, actors, and dancers have long reacted to each other while they were performing. But, it is new to the audience. Whatever claims may be made for the

involvement possible with vicarious experience, art forms based on full-body participation in composed interactions offer a radically new dimension to the arts.

There are two major threads in artificial reality experiences. The most visible of these employs the head-mounted display and instrumented clothing. The purpose of the clothing is to help the computer perceive the movements of the participant's body. The other thread instruments the environment rather than the individual. Video cameras, sensory floors, or other non-invasive technologies sense the participant's behavior, which is then analyzed by specialized computers. Video projectors are then used to provide an environmental scale display.

Conceptually the two technologies address the same goal. At the moment, each falls short of its own ideals. Together they suggest a new kind of experience that will affect the arts, practical applications, and the culture at large. If these claims seem grandiose, it would be odd indeed if every aspect of life but art were to be radically changed by computers.

What kind of art will an interactive medium provide? There is no single direction for this work to follow. Instead, there is a range of options, all of which should be examined. On the one hand, since it involves a temporal element that is uncommon in this setting, it might be viewed as more closely related to the story arts such as theater, film, and television.

The most obvious implication of interactive art is that the role of the artist is no longer final. The behavior of the individual participant is not determined by the artist, and it is these actions that give the work its final form. The artist is like a composer whose score is interpreted by conductors and performers. Therefore, one of the directions that interactive art can follow is for the participant to be given an aesthetic medium to play with -- one for which the compositional rules are not already understood, so the individual is not intimidated by knowing what a trained artist would do. The premise is that the experience of being an artist is what should be shared rather than the art product itself.

In my own work, some of the VIDEOPLACE interactions comment on the relationship between humans and computers -- a now-permanent part of the human condition. Whereas most such interaction is still mediated by the hundred-year-old keyboard, and more recently by the 25-year-old mouse, our relationship to computers can be anything we want -- if we know what that is and we think to ask for it. In these interactions, your fingers are used to draw, attract graphic string, or to play musical notes. An open hand magically signals the desire to erase the screen. In a world in which we use the computer all day every day, the design of the human interface is as much an aesthetic issue as an engineering one, for if you have an ugly interface, you have a lousy life.

In other interactions, you are given a new body on the screen. You must move your real body to discover how to control the new one on the screen. This kind of exploration is natural for a child, who awakens each day in a body whose capabilities have been expanded. For adults, exploring the effects of moving their bodies will lead them to assume postures that they have not adopted since they were children -- and thus, I hope, reawaken the child in themselves.

Another series of interactions introduces the visitor to specific aspects of artificial realities. For instance, the CRITTER interaction shows that artificial realities will be inhabited by synthetic creatures. Since CRITTER was born before the invention of video games, he was never pressed into a life of predictable shoot-em-up behavior. CRITTER's goal is to engage you in a whimsical interplay. While he is not intelligent, he is an early example of a new life form -- the artificial entity. These creatures will become increasingly convincing as time goes by -- to the point where they can pass for real in casual encounters. Artificial reality is where we will encounter artificial intelligence when it occurs.

Finally, artificial reality fundamentally redefines telecommunication. Whereas, we typically think of telecommunication as being between two locations, the term VIDEOPLACE refers to the new place that is created by the act of telecommunication. This place consists

of the information that is available to both participants simultaneously. Thus, the telephone creates a purely audio space in which gestures are meaningless. Two individuals can enter VIDEOPLACE from different locations, and yet sèe themselves together in the identical images displayed in their respective locations. A similar telecommunication space can be created in the three-dimensional worlds viewed through head-mounted displays.

The new telecommunication place is explored in a final class of interactions. In these, the VIDEOPLACE participant is interacting with a second participant who is sitting with her hands resting upon the VIDEODESK. An overhead camera provides a view of the hands that is displayed on the VIDEOPLACE projection screen. The VIDEODESK participant can select interactions as well as participate in them. The juxtaposition of the giant VIDEODESK hands interaction with the full body of the VIDEOPLACE participant's image presents some interesting visual as well as interactive possibilities. These interactions suggest that the interactive artist will not only be concerned with the relationship of a single viewer to the work, but can also comment on the relationships among two or more people.

The opportunity to create composed interactive experiences offers a new universe to the artist. Such interactivity will also be an important source of concepts and material for the performing arts. By their movements, dancers can create the music they perform to. Their real actions can have new significance in simulated worlds. Live actors can interact with simulated beings.

The new artistic medium will change our ideas about knowledge and how we impart it. For centuries, the intellectual elites have celebrated their rarefied abilities to manipulate symbols and to understand abstract concepts. Artificial reality is based on the opposite premise. It assumes that the brain evolved to serve the body and that the ability to perceive and act in the physical world is the universal heritage of all humankind, whereas the world of notating is the province of a few. There is a place for forms of learning and types of information

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experiences are inherently participatory and physically involving. While they can take place in completely computer-generated worlds, these experiences can also be superimposed on the real one.

Rather than splitting us apart, these experiences offer new ways of being together. One of the most notable facts about our world is that we seldom live near the people we care about. Instead, we must work to maintain these personal relationships at a distance. In fact, the most rapidly growing use of leisure time is talking on the phone to friends and family. Artificial realities offer us new ways to be together at a distance when we must. At a time when we have little to do with our physical neighborhoods, artificial realities can be used to create graphic gathering places for our intellectual and emotional neighbors.

Are there negative possibilities? Certainly. Physically rehearsing a violent action seems more dangerous than passively observing someone else do it on television. On the other hand, I am old enough to be living in the future I was warned about. I see little evidence that Americans have much inclination or talent for using technology to do evil. There are errors caused by greed and stupidity, but our corrective mechanisms will probably kick in more rapidly than necessary. On the other hand, will artificial realities make us happy? No, our wiring does not permit that. But, we did not invent artificial realities. They were there waiting to be discovered. We have an obligation to explore and enjoy the new realm that Nature has revealed to us.

NEW MYTH

A conversation between Janine Cirincione and Jaron Lanier

JC: The first question is a big one. Given the many current applications for virtual reality technology, what kind of an impact is VR really going to have on our culture? Especially as an aesthetic medium.

JL: Obviously, I'm mostly interested in the possible benefits, and I think there are two of them: number one, killing television, and number two, providing a new myth for how people use technology in the long run.

As far as killing television, I try to come up with a new medium that's so wonderful people will want to use it instead of television, but one that brings with it increasing interactivity and democracy.

As far as the second point goes, as a new myth for interaction with technology, VR places human *experience* at the center of what technology is for, rather than human *power*. Experience is something we can attend to in what has been called an 'infinite game' as opposed to a 'finite game.' The more powerful we become, the more of a danger we will be to ourselves, whereas the more we focus on experience, the deeper our lives become. It's really a different center.

JC: Do you think that there won't be a problem similar to the one we have with broadcast television? People who'll design virtual worlds will, at least at first, have a certain control over the kinds of experiences we can have.

JL: Sure, but right now that's a very difficult question to address because we're not used to the idea of being able to make our own worlds. Or at least most of us aren't. Once you've experienced making your own world, it's completely infectious. One of the comparisons I make is that the reason Californians are so loathe to give up there cars is the existential ecstasy of being able to decide, "I'm going *here*, with *my* shit, in *my* car, right *now*, as opposed to waiting for the bus. Essentially, being able to design your own worlds gives you that same feeling. I think that's a very healthful sort of thing when it takes place in the virtual world.

JC: I'm constantly struck by the optimism that I hear in your interviews -- and in fact within your community -- which is diametrically opposed to the pessimistic world view that seems to permeate other disciplines today. Is it because working with something in its nascent form is necessarily driven by optimism, or is it something about this particular technology?

JL: It's specific to the technology. Actually, I should qualify that. I think the reason you're detecting this optimism is because the very premise requires optimism. The idea is that the media is part of the problem. Marshal MacLuhan was, among many people, perhaps the best at pointing out the power of the media and the ways in which it is a problem. If you're going to create a solution, you have to come up not just with new uses for a medium, but with new media from the ground up. If you're going to make solutions you have to be optimistic. It's the only pragmatic choice. This is really a very political thing. It's about what the next century's media is going to be like. Is it going to be super-television, or is it going to be something better? You're talking to a group of people who are trying to make it into something better.

JC: It's a spirit I don't encounter very often.

JL: I don't want to dis-ingratiate myself with the art world, but the truth is that the art world per se experienced a similar period of optimism earlier in this century. This is simply a different period. There seems to be less focus and less energy in the art world. I think what we're going through in our community corresponds to what you saw in art movements at the turn of the century, when they were really new.

JC: That's true, the earlier art movements really were about forging a new way of life that included architecture, product design, fashion, social conventions, and the fine arts; they were all combined into one world view.

JL: I find it very instructive to look at that, because it's filled with both successes and failures. I feel that my life and those of the people I love and those around me were immeasurably improved by the cultural movements of the early 20th century, but I'm sorry about all the stupid Bauhaus buildings, too. Although they weren't perfect, those movements did make a big difference.

JC: Do you think that there's something happening right now, culturally, that's leading a group of people in this new direction? So much of what the whole industrial age has been about has been destructive. It seems we've reached a kind of negative climax in the last ten years, and VR promises to move us out of that.

JL: I made a distinction before about being power-centered as opposed to being experience-centered, and I think that's really a key juncture. There's every reason in the world to curb our appetite for power. It's the thing that endangers us. Human behavior is the issue. What people want ultimately is experience, because power is not real. Power only exists within a social abstraction. But experience is the most real thing there is. So what I think we're really seeing is a shift towards a more sensual and

aesthetic definition of what technology is for, and I think that's part of a very positive large-scale trend. One of the things I often say is that if I believed there were an option to go back and away from technology and technological movements, I would, but I don't think that's an option because we just love technology too much. So I think the real question becomes, what should our relationship with it be, especially in the long run? Virtual reality centers not on the human being but on human experience. It says that the purpose of technology is to create communication experiences between people, to facilitate the creation of wonderful experiences that they can share. That's an entirely different goal from making some people powerful in order to dominate others.

JC: Don't you think it's part of human nature to crave power and to want to dominate others?

JL: The interesting thing about power is that it only has meaning in a social abstraction. Essentially, power is concerned with the issue of us and them. That boundary's very difficult to define these days, and that's why people who are powerful are so nuts. Right now they're not sure whom they're supposed to be dominating, and it's very confusing for them. National entities are very much in question right now; they're being erased and recreated all over the world. Corporate entities aren't exactly aligned with national entities any more. Ultimately, people aren't satisfied with being individual brokers of power, and they need to coalesce into groups. It's a very strange time, and to me, that sort of confusion about what a power block *is* goes along with the same trend. Our traditional idea of power doesn't work any more. Power is just another psychological game that can be expressed and satisfied in many other ways than actually harming other people.

JC: Do you think people will be tempted to replicate the same kinds of social spaces in the virtual world, play the same kinds of games, and recreate the same kind of power blocks?

JL: I think they'll unquestionably recreate every ugly and rotten human emotion possible in VR. It's a full, rich medium, just like written language or the painted canvas. It will contain all the ugliness, all the beauty, all the wonder, and all the mundanity. The difference in the case of virtual reality is that it has the possibility of functioning as an objective social space. It has the possibility of taking over a role normally filled by the physical world, which isn't malleable enough to be an instrument of cultural creation. In VR, you're creating a type of socially shared objectivity. This is normally reserved for language and music and a few other fluid forms of expression. It's something quite new. We won't see the effect for decades, until there are a whole lot of cheap VR systems. And we'll have to survive a lot of threats just to get to that point. But once we make it to that point, we're creating a cross between the media and the real world. It's a new type of theatre for experience. It will have the same social properties that the real world does, but the same of lack of ultimate consequence that art does. It will cross the objectivity of the real world with the richness and fluidity of art.

Now, there are a few computer crazies who believe that we're eventually going to copy ourselves onto disks, but I find that idea both wrong and distasteful. But the bodies we have are quite limited: we can imagine a world, but it's so hard actually to change the world that we're part of. VR gives us another world that we can share and change.

JC: Stanley Aronowitz recently spoke about how we are moving into the post-labor age, beyond the post-industrial, when people really won't have jobs in the way they do today. If millions of people have lots of free time, will virtual reality be of use to them?

JL: Boy, that's a person in an ivory tower. But I do think there's a question there -- what's humanity to do on this planet for the next few millennia -- and to me the project of creating new shared fantasy worlds,

and inventing new languages inside them made of direct manifestation of things instead of symbols, is the kind of grand-scale multi-century project that a species could occupy itself healthfully with for a some time, I would think. When I talk about the practical social effects of VR, I'm mostly thinking 50 years in the future. You have to remember we're really talking not about technology but about culture. Even if the technology moved super-fast and became super-cheap, its cultural impact would mostly be in the next generation anyway. So it would at least be some years ahead. Since many of the people involved in VR are kind of exaggerating or bragging, the projections become really insane. There's a whole world of virtual-reality information reports which are all wrong. People ask me for something reliable to read and I just can't recommend anything. It's a difficult situation.

JC: Someone was joking with me and saying that the only people who are really making money with this field right now are the ones who are holding the conferences. I think on just the most basic level even talking about it has become a certain kind of fantasy.

JL: It's definitely become the speculation topic of choice in the scene out in San Francisco. I don't know if it is in New York at this point. If it's not, I'm sure it will be. It's been kind of fun for me to see the whole thing develop. I really hope that it makes a difference. I hope it will have influence not only on this type of technology, but on others too.

JC: To get back to where the technology is right now, do you feel that enough support is being given to VR development? Are we making some of the right choices now, early on, in terms of how it should be applied?

JL: No. There are some wrong choices being made, although they're not specific to virtual reality. In general, the way technology is created is wrong. The very earliest phases of virtual reality were great -- when we were doing projects in my garage ten years ago, that was great. But I

feel ultimately, if there were some way we could have the kind of industrial policy that European countries and Japan have, combined with the spirit Silicon Valley has, that it would be a great fulfillment. What happens, unfortunately, is that any great thing will strike Silicon Valley; then it will be fumbled, to a certain degree, within the United States, and then it'll get picked up by corporate and national interests that have less vision.

JC: The one thing that the United States really has going for it is its cultural production. But it's slipping away.

JL: It's very disturbing. One of my old little phrases was that social units move between phases of inspiration and institution. The United States is just not in good shape right now.

JC: VR seems to be one place where there is a great deal of hope.

JL: I wish I could communicate something very critical to the rest of the virtual reality community, such as it is. It's not the technology itself, it's the hope that's the center. The technology will have many disappointments. But that hope, that cultural energy is the important thing.
    People need external objects on which to project internal experiences in order for them to be fully real. To a certain degree, virtual reality is serving that role for a certain kind of cultural optimism. I think that's very wonderful and very precious. But it's also vulnerable, since when you project yourself onto an external object, your internal energy is at the whim of the state of that object. So I hope that at least some critical mass of people within the virtual reality community realizes that, and are able to transfer that same energy to something else whenever the time comes.

JC: How will artists and other cultural producers have access to VR?

Will most of the creation remain in the hand of large corporations, like with television?

JL: At least every VR system is also a VR development system. Every television is not a television studio, but every virtual-reality system is a virtual reality studio. At least potentially. You have to artificially put brakes on it to prevent that. Luckily, the dynamics are just utterly different.

JC: How much is interactivity going to change what we know about art?

JL: Art's going to change, but there are precedents, and let me give you an example. Poetry does not use any tools whatsoever that are elitist or are hard to get access to, and yet there's poetry that's so commanding and so powerful it unquestionable speaks to us in a way that ordinary jotting-downs don't. The underlying material with which poems are made is so ordinary and accessible, there's nothing special or precious about the poem as an object in itself. As virtual reality spreads around more and more, virtual worlds will become more and more like that. The components and resources will be very accessible and ordinary, and yet there will be those virtual worlds and those people who perform within virtual worlds who'll achieve transcendent power.

The whole issue about which art is real, or which art is the more precious, isn't too important. It's just incredible to me that people even worry about these issues. The experiences I've had with art that matters to me are so powerful they're beyond question. They're fundamental experiences, not derivative experiences.

If art isn't overwhelmingly powerful, screw it. I think if artists find themselves groping they haven't gotten there yet. I think when the art side of virtual reality hits it will be obvious and very powerful, and there won't be any question about it.

JC: Do you think that there'll still be a big distinction between the

artistic virtual reality experience and other kinds of VR experience?

JL: I think that there will be that kind of distinction, and perhaps even more distinctions than there are currently. If you look at the uses of written languages, there are literally thousands of them that we distinguish in everyday life, from things like bills to things like poems, to highway signs. I think the same sort of varied complex of distinctions will arise around virtual worlds at some point. And there will always be various fine art communities that will try to place themselves above one another. That's just part of the fine art thing -- it always has been and always will be.

JC: For better or for worse, it's one of the things that drives the primal spirit that goes into art making.

JL: I love art, and I think anybody who does has a mixture of awe and cynicism about the art scene, right?

JC: You have to be cynical about it.

JL: I'm probably not cynical enough to even talk about it within the city limits of New York.

JC: That's probably true. There's probably no other system that's as corrupt on every level as the art system.

JL: No, there is one more.

JC: Which one is that?

JL: You wouldn't believe what the corporate world is really like, but that's another story.

A VR FIELD REPORT

Brenda Laurel

From its strange childhood in military and government labs, virtual reality has emerged as a Major Concept in the pop-culture scene. It's been hailed as the techno-wave of the future, with potential to transform everything from movies to medical imaging. It's also been demonized as the latest in mind-control drugs and the world's baddest war machine. Philosophers have adopted it as a platform for renewed debates about the nature of reality, the evolution of global culture, and the relationship of technology in the body and the physical world. Nearly everyone agrees that a head-mounted display will give you a look inside Pandora's black box. The mythology of VR is a key to the pop-culture view of how the world is changing -- a many-faceted icon for the coming weird times.

Over the last two years, I've given a considerable number of demos, workshops, and talks on various aspects of VR around the world. I've heard the idea worked over by a lot of people -- businesspeople, computerists, artists, social scientists, military types, medical types, architecture types, teenage acid-house-music-groupies, Australian farmers, and little kids. This paper is a field report about some of the issues that keep coming up in the global conversation and a brief investigation of how they might be connected to issues in design as well as culture and politics.

The questions and comments coming from audiences in talks and interviews are confirming some of Marshall McLuhan's fundamental observations about how technology and art influence experience:

> Anything that relates the environment to high
> intensity, whether it be a storm in nature or

violent change resulting from new technology, turns
the environment into an object of attention. When it
becomes an object of attention, it assumes the
character of an anti-environment or an art object.

-- Marshall McLuhan and Harley Parker,
Through the Vanishing Point, 1968

..."the role of art," McLuhan continues, "is to create the means of
perception by creating counterenvironments that open the door of
perception to people otherwise numbed in a non-perceivable situation."
This is the way VR is triggering fundamental changes in how we view
our lives and the world.

WAR

Let me give you some examples, I was part of a symposium on VR
at the San Francisco Art Institute a few months ago, talking to a frisky
crowd made up mostly of San Francisco's hip young arts community and
techno-groupies. There was a Pakistani woman in the front, wearing
native clothing and speaking English with difficulty, who endured a
four-hour discussion saturated with tech-talk and artistic esoterica in
order ask a question: "How can you justify what you are doing when the
price of one of your 'virtual realities' would feed hundreds of starving
children? What is your *virtual* reality doing to *reality?*" From there, the
conversation took a decidedly Luddite turn.

At *Art Futura* in Barcelona in January of '91, the speakers were
hanging out in a club after hours while videos of Survival Research's
robots engaging in virtual warfare ran on three projection screens.
Suddenly the middle screen went to snow, and then an eerie low-res black
and white image appeared of what seemed to be a little projectile
slipping silently into a slot in a little grey box. That's how CNN and
Survival Research brought us the start of the Gulf War. Survival

Research's Barcelona bot wars had to be postponed because their venue, the port of Barcelona, was now part of the *real* war. At VR conferences around the world, somber crowds have been watching replays of networked flight simulators enabling American pilots to fly the virtual skies of Kuwait and Iraq through the use of satellite imagery mapped onto 3D terrain models.

The questions boiled down to the same fear again and again; when war can be virtual for some of the warriors, what will happen to the world? What becomes of humanity when Orson Scott Card's *Ender's Game* comes true? What happens to the meaning of the body -- of pain, suffering, and death? And what becomes of morality when the flesh-and-blood price of our decisions needs not be paid? Things are out of control.

SEX

Two years ago Howard Rheingold published a piece in the Whole Earth Review called "Teledildonics," painting a picture of the brave new world of computer sex. In VR, Rheingold said, you can map any nerve ending to any part of your self-representation--so how do you know what you're tickling when you and I shake virtual hands? "Virtual Valerie" made that first small step for man, and the tabloids went wild. Last summer a French telecommunications researcher reported matter-of-factly that during certain hours, over half of the "tryst" traffic on the MiniTel network was made up of people who were logging on as the opposite sex. At *Ars Electronica* in Austria, a female artist places VR along a continuum beginning with tattooing and piercing, as a potent form of self mutilation for sexual pleasure and emotional relief. This month the conversation about virtual sex has found its way into the pages of Elle Magazine, and now other "mainstream" magazines and network talk shows are picking up the scent. A California college student muses on the net, "Real bodies experience real emotions. How will emotions change? Virtual emotions? Virtual feelings?"

Cultural historian Stuart Moulthrop made these observations about VR and postmodern sexuality in a recent net conversation. He said that whatever we may mean by "virtual sex,"

...we can expect the glossies and the tabbies to mean "Sex with machines." Why not? Sex has been thoroughly commercialized and industrialized anyway...In a rapidly aging, increasingly paranoid America (facing among other things the Third Wave of HIV epidemic), this could be a concept with considerable marketing clout. Somewhere out there there's probably a bright fellow who remembers the meteoric rise of Hugh ("Playboy Philosophy") Hefner, how he surfed that particular swell of cultural chaos called Sexual Freedom.

> ---Stuart Moulthrop, Georgia Institute of Technology
> [quoted with permission]

There are several kinds of control issues here. Will this powerful new medium exert even more control than existing media over our sexual self-definition and activities, even to the point of replacing our bodies? This is the fear of losing control to a medium, an institution, somebody else. Rich Gold (Xerox PARC researcher and designer of Little Computer People) maintains that techno-colonialism consists in *noticing* something that somebody already uses, co-opting it, and selling it back to them -- "how would you like to buy this nice desktop?" Go extrapolate.

VIOLENCE

Another kind of control issue is the fear of losing control of oneself -- without the familiar parameters of the flesh, without an easy way to distinguish between reality and imagination, might VR unleash the beast within? In November I was doing a call-in radio interview in Adelaide, Australia. After my glowing description of the new medium and all of its applications, we took our first call from a woman who

asked "Could kids on drugs in virtual reality become homicidal criminals?" My husband was in the studio with me and we just looked at each other for a minute, trying to grok. Finally, hoping to move the conversation along, I replied "Yes, next question?"

But the callers were on a roll, asking all of the questions from hell; "Will people get addicted to this stuff?" Well, "yes," again. But I hastened to add that people get addicted to anything. "When I was a kid," I said, "I was addicted to books. Every three or four days I'd go out and ride around on my bike to regain contact with my senses after an orgy of Heinlein, Clarke, or Nancy Drew. The problem with addiction isn't the medium, it's what makes us addictable..." but nobody was buying it. The callers were convinced that VR 'providers' are dealers of a new and powerful drug, luring their hapless victims into a shadowy world of un-life. And when somebody finally erupts from that virtual cage, like a crack-fueled crazy with an AK-47, they're going to be out of control.

CULTURAL OPPRESSION

In among these images of addiction and enslavement are little threads of hope, often expressed in such negative ways that it's easy to miss them. In Santa Cruz, a feminist sociologist got very angry with me for the admittedly utopian picture I was painting of how VR might influence art and stimulate imagination. "That's easy for you to say because you're an insider -- you have access. But what about the marginalized?" she challenged, "What about ethnic minorities? What about women?"

I had to think carefully about my response.

First of all, I reminded her that I was a woman (I believe my exact words were "What am I? Chopped liver?"), and that one way for women to get into VR was to get actively involved in the industry rather than whining on the sidelines for somebody else to make the way smooth. Then I asked her what she had in mind about the other "marginalized". Should first-world white heterosexuals build little virtual terraria for

Blacks, Latinos, gays and lesbians -- based on their own ideas of what such cultures were like, and saturated with their own liberal hidden agendas? I wondered, wasn't she preaching to the wrong group? Shouldn't she be evangelizing with the marginalized to persuade them to co-opt the technology? I was reminded of the traps I fell into as an idealistic young student trying to work in the Civil Rights movement. It was made unforgettably clear to me then that white liberals could be excellent spear-carriers in the battle for Black student rights, but it was entirely inappropriate and violently resisted when whites tried to assume leadership roles.

This is a conundrum that there isn't an easy way out of. On the one hand, there is value in a 'global village' that can replace nationalism and ethnic strife with a sense of membership in a global community. But on the other hand, the mass destruction of the aesthetics, wisdom, and self-esteem of indigenous cultures bears much of the blame for the global resurgence of fundamentalism and ethnic violence that could extinguish us as certainly as an old-style superpower Armageddon.

Can virtual reality save us? Or is it really just the best of first-world whiteman escapism? Last year in an interview about VR, William Gibson said this really true thing; "The future has arrived, it just isn't evenly distributed." Well, the future arrived in the 50's in the form of TV, and by 1970 it was pretty well distributed. Telephones are fairly well distributed, too. The real question isn't whether the disenfranchised of the world will soon have access to interactive media; history suggests that at least a significant portion of them will, if for no other reason than to receive and respond to targeted advertising. The question is whether the power of technology can be successfully expropriated by them to repair and grow their own cultures, as well as to facilitate the growth of a global culture that begins to give people a place to come together and grow strong as a community.

Again, the issue is control, and the assumptions are that the medium is under the control of various flavors of culture police -- advertisers, government agencies, first-world institutions -- and that it

will exert control over us, the poor beat-up consumers of the world, and probably deal a death blow to what remains of our humanity, our sexuality, our political influence, and even our environment. After all, when we can zip off down the cable in a burst of pixelated radiance, we won't be making any more trouble about rainforests. And we'll discover our mistake too late, when we're in a place that is a non-place, wrapped in sensation but divorced from our bodies, subjected to an endless rape of the imagination. At *Art Futura*, Laurie Anderson remarked that you couldn't close your eyes in VR, and I'm not at all convinced that she was speaking metaphorically.

DESIGN

The pop-culture myth of virtual reality is all about control. Not coincidentally, control is also a central issue today in the dialogue about virtual-reality *design*.

There is a train wreck where the traditional idea of authoring meets the requirement of interactivity. The explanation lies in the notion of control over form. The authors of stories, books, plays, or movies construct form through the selection and arrangement of their materials; authors are *in control* of the anatomy and metabolism of their plots. In interactive media, this sort of exclusive control is theoretically impossible; to the extent that participants have the power to make significant differences in what goes on, the author's control is eroded. Ultimately to provide robust interactivity while preserving formal control, one would have to manage the plot 'live,' like a puppeteer, or build one hell of an expert system. (I think some crackpot already suggested that.)

Meanwhile, the goal of achieving an experience of unconstrained, fully imaginative interaction in computer media remains elusive. The accoutrements of interactivity -- the symbolic artifacts of the notion of interface -- are an uneasy compromise. Interactivity, in the form of menus, soft buttons, metaphorical tools, or explicit 'user constraints,'

surfaces the dimension of participation and objectifies it, over-specifying what people can do in relation to images or environments. *It is a kind of control.* Interactivity usurps the kind of deep participation that we have in paintings, films, poetry, or landscapes -- the experience of free imagination collaborating with the work.

Authoring for VR brings the problem to the front. Without interface artifacts -- without elaborate gestural languages or menus in cyberspace -- we find it even more difficult to carry on 'interactivity as usual.' Virtual environments are just that -- *environments* -- and try as we might we haven't come up with a way to plant narratives in them.

My colleague Rachael Strickland and I have been trying to come at the problem another way. Instead of asking how to author narratives that people can interact with, we've been looking at how kids 'construct' narratives, if you will, in their story play. What predisposes kids at play to have an interesting time, to be inventive, to generate 'plots' that are emotionally satisfying? What kinds of environments and materials are most generative? Do highly specialized toys like Barbie Dolls and GI Joes help or hinder?

We did some intensive field work in a kindergarten classroom and watched how a master teacher facilitated narrative play. We used Native American story materials, imagery, and objects in an attempt to avoid evoking the traditional narrative structures that are embodied in western-style fairy tales. We think we've rediscovered and begun to expropriate some interesting ideas.

One is the notion of ambiguity. Rudolph Steiner, in his writings about the Waldorf approach to education, said that if a child has a doll made of a folded napkin "he has to fill it from his own imagination with all that is needed to make it real and human. This work of imagination molds and builds the forms of the brain." Visual ambiguity also requires a certain kind of complexity to work -- people see faces in rocks and clouds but rarely in thousand-polygon displays -- a warning to the devotees of chrome-ball photorealism. In the classroom, we watched kids make silk scarves into wings and weather and wrinkly walnuts into the

faces of fairies and kings.

Something else that evokes intensely imaginative responses among kids are things they can manipulate -- both natural and symbolic objects. The theory was articulated by another important educator, Maria Montessori:

> A child is delighted to make and unmake something,
> to place and replace things many times over and
> continue the process for a long time. A very
> beautiful toy, an attractive picture, a wonderful
> story can, without doubt, rouse a child's interest,
> but if he may simply look at, or listen to, or touch
> an object, *but dares not move it*, his interest will be
> superficial and will pass from object to object.

-- Maria Montessori, *The Discovery of the Child*, 1948

Again, our experiences in the classroom made us believers. Rachael and I are working on the design of a virtual world that incorporates various kinds of manipulatives, from animistic objects that have minds of their own, to 'stuff' -- things that other things can be molded or shaped out of.

As part of the Coyote project, we've also been investigating the kinds of relationships people have with environments as another source of design insight. We've been inspired by the work of environmentalist/writer Barry Lopez, who observed in an essay entitled 'Children in the Woods' that a natural landscape -- even one that is as seemingly sparse and uniform as a desert or grassy plain -- contains literally too much detail to be taken in as 'content.' Lopez asserts that when we *engage* with landscapes, what we have perceived is *patterns*, and what we infer is *relationships*. This suggests to us that a classical-object-oriented approach to creating virtual landscapes may be inadequate for the task of creating relationships among objects and between objects and

their environments, for specifying the dynamics from which patterns can emerge.

In an essay entitled 'Landscape and Narrative,' Lopez makes another point that seems to us to be the most important of all in the context of designing in an environmental medium:

> Among the Navajo and ... many other native
> peoples, the land is thought to exhibit a sacred
> order... Art, architecture, vocabulary, and costume,
> as well as ritual are derived from the perceived
> natural order of the universe -- from observations
> and meditations on the exterior landscape. An
> indigenous philosophy... may also be derived from
> people's continuous attentiveness to both the
> obvious (scientific) and ineffable (artistic)
> orders of the local landscape. Each individual,
> further, undertakes to order his interior landscape
> according to the exterior landscape. To succeed in
> this means to achieve a balanced state of mental
> health.

> --Barry Lopez, 'Landscape and Narrative,'
> in *Crossing Open Ground*, 1989.

These observations identify a fundamental kind of relationship with the environment that is in extreme contrast to Judeo-Christian notions of control and domination over the natural world. It also suggests that humans have an intrinsic need -- pragmatic, emotional, and spiritual -- to form deep and harmonious relations with their environments.

In aboriginal cultures in Australia, the relationship with landscape is perhaps a more perfect kind of collaboration. In his book *The Songlines*, Bruce Chatwin's semi-autobiographical narrator recounts this incident:

"Sometimes," said Arkady, "I'll be driving my
'old men' through the desert, and we'll come to
a ridge of sandhills, and suddenly they'll start
singing. 'What are you mob singing?' I'll ask,
and they'll say, 'Singing up the country, boss.
Makes the country come up quicker.'"

-- Bruce Chatwin, *The Songlines*, 1987.

The earth is sacred to the aborigines because it is the repository of
all potential, and humanity sings it into form -- a vital collaborator in
the alchemy of being.

This particular moment in the evolution of VR feels like a
watershed. The recapitulation of previous forms seems to be as intrinsic
to the evolution of media as it is to the development of human
individuals in the womb. But there comes a time when you run off the
end of old models and you're in the region of something genuinely new.
Control turns into midwifery -- you have to back up a step and give the
thing a chance to emerge.

We've run off the end of easy extrapolations from narrative and
drama, and we're moving into a region of ideas that are objectively more
intractable but intuitively much more lively than the old models. We're
designing examples that will help us develop our ideas as we see how
people participate with them. And these examples embody something
new: they replace the paradigm of control with the paradigm of
collaboration -- the idea of empowering imagination through
collaboration with environments, and the notion of form as something
that emerges through a time-displaced collaboration between originating
artists and realtime participants.

The pop-culture myth of VR is an artifact of our growing
awareness of the lethal dysfunctionality of control as a paradigm for our
relations with the environment, other cultures, and other individuals. The

functions of VR in contemporary culture are wonderfully symmetrical: while VR is a lightning rod for fear and despair, at the same time it may serve as a testbed for working out, trying out, and embodying new ways of being in the world.

FALSE OR ALTERNATE

A Conversation between Brian D'Amato and James Meyer

JM: The question is, is virtual reality an alternative reality, as you claim, or is it just plain old illusionism -- Western illusionism carried further, with all the ideological implications of Western illusionism, which the art of this century has done so much to attack.

BD: First of all, illusionism can be used for a million things. VR can be used for illusionism but that's not its most interesting use.

JM: I say it's just illusionism brought further. You lose yourself all the more. You step through the looking glass and you're lost in the VR world that's been designed. It's in Renaissance perspective. You interact with it but you aren't *in* it.   I'm claiming it's just illusionism. Whereas you want to say it's an alternate reality. Could you speak more about that?

BD: I just think that its most interesting use will not be in terms of creating a virtual environment that's like the environments we inhabit now, but in creating totally abstract environments.· Speaking of the tradition of Western abstraction. I don't know why we keep saying Western, I don't know what Eastern abstraction is, in terms of being qualitatively different. And as far as 'Western' goes, VR isn't limited to Renaissance perspective system, or whatever. It's just a model. You might as well say the *real* world is 'in Renaissance perspective.' At least VR gives you the option to create all kinds of spaces in it, the space of a

Lissitsky or a Japanese print, or new internal spaces that don't depend on distance at all, things you could never create in real materials. Illusionism -- and I still don't know why it remains necessarily evil -- illusionism as we know it is not intrinsic to the medium.

But I do feel that in the future, people who use these virtual worlds will not be so hung up on making their hand in the virtual environment look like a real hand, but instead they'll be interested in extending their bodies to other sorts of creatures and other sorts of unlimited ways of interacting with this world: maybe if you move your finger, something way far away moves...

JM: But Brian, how can you call that world an alternate reality? It's man-made; it's pre-designed; it's digitalized; it's all pre-planned.

BD: The world we live in *now* is all pre-planned, part of it by humans, part of it by evolution, part of it by the laws of physics. But the virtual worlds are not going to be necessarily any more or less pre-planned than the world we live in now. They certainly *could* be very planned-out in advance for the user, but they could also be much more in the realm of construction kits: much more like something you can make your own reality out of. Which, I think, is ultimately the form it's going to take.

Right now the technology is very primitive, so it's a little silly to speak of it in terms of these vast universes that can be created in any mold we want. But I do feel confident that maybe not in our lifetime, but eventually, digital interface with human beings will give us almost unlimited scope for this kind of thing.

JM: The thing is though, it is *not* reality -- this is not reality, Brian. There's a difference between this side of the looking glass and the other side of the looking glass, and the other side is not reality.

BD: Neither is what your senses experience directly 'reality.' It's the old brain-in-a-vat argument. Maybe you will be putting people in the vat

a bit with VR, but you can't tell me that you can prove that they aren't in a vat already.

JM: What are you saying?

BD: The philosophical question is whether it's possible to prove that you are not just a brain in a vat being fed stimuli. It is an old philosophical question that prefigures this debate about virtual reality.

JM: I'm getting lost here.

BD: Say this is actually far in the future but you just don't know it. Somebody has this old brain, a kid's brain, and he puts it in a vat, connects all the nerves up to a computer, and feeds information into the sensory nerves.

JM: Brian, I'm sorry, but I am *not* a brain in a vat. I'm a real body living in the world.

BD: You can't prove that. There've been books written about this.

JM: There have been books written about the fact that I am a real body existing in the world.

BD: That's an essentialist position. But let's assume that we are.

JM: As a reader of Merleau-Ponty, I believe in 'direct experience' -- something like direct experience in my interaction with things has a kind of tangibility, a 'reality,' which virtual reality can not have: virtual reality can only simulate.

BD: I don't know about that. If you're privileging the direct stimulus that you receive from the world as the foundations for your reality, and

this experiential interface with the real world is the definition of what is real to you, then I don't see what makes that different from *information* about the world, or about some other world, that's received digitally through mechanical intermediaries. There is no theoretical qualitative difference between those two types of information.

JM: I guess for me there is.

BD: Which is what?

JM: One is real and one is...

BD: Real? How can you use the word 'real?' First of all, this reality is already virtual enough, as far as I'm concerned. Cities are tremendously artificial.

JM: Look, Brian, you don't need to tell *me* that contemporary society is utterly mediated. I'm just saying that there might be something like an experience we have which we might have a distanced relationship to, or which is mediated away from us, but is still something like the real. That is a different experience from the experience one might have in a virtual-reality machine. Brian, it's called 'virtual reality,' not 'reality.' I'm concerned about people mixing up the illusionism of that space with the space of living and trying to do something in this life. It's a model of endless escapism. That's where the question of political responsibility comes in.

BD: As Jaron Lanier says, "Reality is what's on the other end of the senses."

JM: Then we're going back to what you were arguing before, the claim that it's reality. You don't want to make a distinction.

BD: Well, TV is a kind of reality too. But what I think I should address -- before we don't address it -- is your position about escapism. I would say that it's unfair to say that VR is simply escapism, to use that against it, any more than you would say photography, or even painting, is escapism. It's certainly not more essentially escapist than TV.

JM: Your point is well taken. It's a blank slate, a medium which can be used by different artists to different effects. I suppose I assumed that it was necessarily illusionistic; that is was, in fact, bringing illusionism further, simply because that's the way it's been deployed so far, and that seems to be the way you want to deploy it. That seems to be its appeal to you. So in a way I was wrongly collapsing together this medium, which could be used in various ways, and illusionism. It's not necessarily illusionistic. I'm just saying that so far it's been promoted as extending illusionistic experience. All these silly war games...

BD: So far it's in a very primitive form. We really have to talk about the future here. To talk about what exists in the present is not very interesting. It's more practical, but the works you will see in the show are just the first halting steps toward what's ultimately going to be done with it -- interesting as they are.

JM: You still haven't articulated any kind of political use for VR.

BD: I'm saying there's already a built-in environmental imperative to the technology itself. I think the technology is actually fundamentally good in its...

JM: Like all digital technologies.

BD: ...as all compression and reproduction technologies ultimately are. We're talking about infinite compression and infinite reproducibility of experience, which theoretically could ultimately eliminate the basic

political imperative of scarcity. Within Virtual Reality there is space available. Space that can be used not only by people who have a lot of money. I'll give you an example. There's very little feminist architecture around because feminists have no money to build such architecture. Architecture has always been, especially since the days of the Bauhaus, a macho, I would even say fascist, anal-retentive, guy-driven...

JM: So you're saying that a feminist architecture could be mapped out, fantasized within the virtual space.

BD: Not even fantasized, it could be lived in, in a virtual space, without the expense of actually building such a building in a real space. It would give the theorists that come up with this kind of feminist architecture a space.

JM: But is it really *lived* in, Brian?

BD: It depends on how good the sensory field is.

JM: No, Brian, it is *not* a real building; it is *not* a bathroom that you can pee in.

BD: Ultimately, you *could* have that experience with it. Maybe not in our lifetime, but perhaps with direct nervous system interface you could. Not that that would be a creative use of the medium.

JM: Again, I'm talking about political responsibility for this medium. The fact is the political is predicated on a notion of creating real change for real people in society, and virtual reality, it seems to me, is a space for maybe *thinking* change, positing change, to change experience, but it's *not* actual change. In fact, it seems to me that the medium's formal logic is inherently contradictory to the possibility of political action. The fact

is that there is racism in society, there is poverty, there are people living in the streets, there is AIDS. For my money these things are real. In 'AIDS and Postmodernism,' you'll remember, I tried to describe the limits of a certain strain of postmodernist theory -- Baudrillard's and Jameson's notion of the hyperreal, the social-as-text -- which it seems to me VR, or the current uses of VR, is extending. I'm sorry, but there *is* something like a political reality, Brian.

BD: I'm not interested in the discourse of mediation. This is *not* about Baudrillard, this isn't about the hyper-real at all. This is about a very basic, specific point in history, in the history of human beings, in the history of consciousness, let's say, where we're getting ready to move beyond the physical bodies that we have evolved from into a digital space. And there are several reasons for this. There are even political reasons.   There's the fact that people die, that the world is very limited in its resources. And that the world isn't very interesting in the types of physical laws that it has. It can't support interesting things like time travel, it can't support direct-consciousness-interface or very much in the way of telepathy. There's a great deal of limitation, imposed by the mere fact of our mortal physical existence, which I think is totally stupid. I'm interested in ultimately downloading people's minds into a digital space where, presumably, they could exist for millennia, and possibly interact with each other in ways that will break down the solipsistic boundaries between consciousnesses. We're talking about a new definition of the human subject. There's nothing *more* political. This is the ultimate purpose of this type of work. It is the theology of these first halting steps into VR, and it's ultimately...

JM: For Merleau-Ponty, and for a lot of Western philosophy, the consciousness is inseparable from the body. The mind and the body are one. And you're getting rid of the body.

BD: Sure, it's all about getting rid of the body. Who's afraid of that?

JM: So we're returning to Descartes?

BD: I don't know what Descartes would have thought of this stuff. He was really into medicine as a way of getting rid of some of the restraints of the body. I just feel that these restraints are unfair. I think you could ask any handicapped person -- differently abled person -- whether he or she is happy with the philosophical justifications of how the soul can't be separated from the body, and I'm quite sure that person would say, "Sure, if you could download my brain into something..."

JM: What happens to gender in this virtual world?

BD: We don't have to worry about that.

JM: No? (chuckle)Do you maintain a gender?

BD: You could if you wanted to or you could try out another one. There might be any number of different genders. We're talking about a system that may exist in a hundred or two hundred years: a system of direct nervous system interface, and almost unlimited building potential.

JM: What happens when the machine turns off? What happens when the electricity turns off?

BD: What happens when the real world turns off? What happens when the volcano erupts, or when the nuclear plant blows up or when the person dies? To me the real world is far scarier than the types of potentially very secure systems storage that will ultimately be housed in vast vaults underground and shot into space to orbit through the galaxy for a billion years.

JM: I guess I just don't *want* to be downloaded; I don't want to exist in

another space. I want to return to *my* space.

BD: That's what you say now, but picture this. Say it's seventy years from now and you're a hundred years old. Say it's 2042, and twenty years ago -- and this is giving technology a lot of credit -- say they developed nanomachines and protein computers that really figured out how to do this stuff much faster than they thought they would. Say somebody invented a direct nervous system interface and you tried it out, out of curiosity, and it was paradise. You could bounce around in any number of Tarzan-like humanoid bodies. You could sail through the air with flocks of multi-colored birds over vast continents. You could dive through the ocean like Flipper. There were cities existing in this cyberspace that had art, music, philosophy and fiction in new narrative forms, vast libraries, a rich history, and it all seemed perfectly real -- unless you didn't want it to; unless you wanted to make certain aspects of it *seem* less real, on purpose. And perhaps there were even more creative mental architectures going on in that realm, whole new lands of thought and feeling waiting to be explored.

    Then, you took the headphones off and you were in your hundred-year-old body, in the same world that you'd inhabited for a long time, which has its points but also has a lot of problems. Would you then say, "No, I don't want to download. I want to die in my body here?"

JM: [Pause] I'll have to see when I get there. But I must confess that I wonder whether these worlds will be built on such a sophisticated level as you propose. I seems like a hell of a lot of technology to be planned, to map out, a lot of experience to reassemble. It seems like a great leap from where the technology is presently to the point that you describe.

BD: Absolutely. Not only is it assuming a lot that all this might happen in seventy years, but it's also giving it a lot to assume that when it does happen, it will be that well-designed.

JM: So if it gets really good, it really will problematize the definition of the real -- I mean the real as a criterion and a standard according to which the figurative, the representational, could be compared. Now, we still haven't talked about your practice.

BD: To finish this -- I hope -- I would say that it won't exactly compromise the definition of the real universe as it exists: there *is* a real physical universe. We are *also* engaged in building a digital universe which exists as a subset of the real universe because the chips and the storage are built out of real things. But it will be a more congenial, flexible space for consciousnesses to inhabit and have the experiences that they associate with life.

JM: What about your practice? What kind of form would you explore to accommodate this new medium?

BD: Well, my practice in this medium is just getting off the ground. Right now I'm working on a video game that's based on ancient Mesoamerican culture. It's called *The Sacrifice Game*. I have to say that what I'm working on is still on a medium level technically, but, I hope, a high conceptual level. This first softworld will be abstract in sections and illusionistic in others, something that is alien in some ways, but also something that is easy to identify with. Something human, something archaeological. It's like making a movie. But it's an interactive movie and presumably very artistic and all of those things.

JM: But it's not like an old movie which runs in time and ends and that's it. This is something that can go on and on, and you can make the movie. The spectator exists in the movie and the movie doesn't stop. It's different.

BD: Right. The spectator will decide how she wants to experience different things. I think this will be true in novels or written work as

well.

JM: I am not sure how this squares with your interest in narrative, your novel-writing and your interest in narrative in previous art, because it seems to me that in virtual reality narrative goes away because it *becomes* a reality, as you say. Narrative implies a beginning and an end. In a way virtual reality would ultimately liquidate narrative.

BD: I think it'll open up new definitions of narrative. I'll give you a sketch of what might be a virtual reality situation, but let me go on about different media for a second. A painting is atemporal, a novel is temporal, a film is temporal, but it's different from a novel because in a film you can't exactly go back and re-read something that you read before. Now that you have video you can, but you don't, really. It's not like reading a book where you set you own pace to some extent. A sculpture lets you set your own pace more than painting, there is a little bit more room for the viewer.

Now, an encyclopedia, for instance, is much more like a primitive computer than a novel is. I think that the kinds of narrative that will be created in these immersive systems -- which is a better word for them than 'virtual reality' -- will be able to partake of all of those elements. You'll be able to go backwards in time to look at something again, you could stop the frame and look at it. You could experience it temporally in a sort of passive way as the narrative happens, or you could take over and be very directed about it and 'write' quite a bit of it yourself. I think that ideally this medium could partake of all the best things of a lot of different media.

I know this is going on a bit, but I'll just give one more example from the present day, and that's the graphic novel, comic books. In some ways they partake of the best things from cinema and from novels, because they can move much faster than either.

JM: But they're also still images that you can examine.

BD: You can examine and go back. So in a way VR is more closely related to graphic novels than it is to film. The graphic novel is a funny in-between medium which was never very much discussed, except that now it's turning out to be very important. I think fields that were always in the margins are the ones that ultimately grow up to be the biggest. Say you're inhabiting a VR world. Let's say that it's not totally non-text-based yet, that it's kind of like a novel. It's not like you are totally experiencing the real thing; you'll read some of what's going on. The creator of this world is in a symbiosis with the user. The user could influence it, or just hang out in it. Say it's based on *Moby Dick*. The person could go on the ship, hang out, kind of influence what is going on in various ways. Nevertheless, the different characters on the ship have certain imperatives: Ahab has a kind of algorithmic free will that will be operating too. So will things like 'history' and 'weather.' These are 'invisible characters' that you might not be able to influence as much.

Then there'll be other kinds of algorithms that will create narrative structures. There will be a sort of invisible program influencing the pace of what happens. Say you even kill Ahab by pushing him over the side early in the story. Okay, you've totally altered the plot. But say the program was good enough to be able to adapt to that. Say Stubb took over the boat and they didn't go after Moby Dick, but it came after him anyway. Somehow the computer worked out an appropriate and presumably satisfying response-tree to this situation that you created.

JM: So you'd write your own narratives.

BD: You would write your own narrative, but there would be certain invisible structures or pacing elements, like Forster's *Elements of the Novel*, that would keep intruding and working on you in various ways; that would also make sure that whatever did result from what you did was within the realm of the vision of the creator of the work as well.

JM: Well, it all sounds like going to Disney World: one of the rides in Disney World. Your familiarity with Disney is an old one.

BD: Disney saw this coming. He made the closest approximation to virtual reality. But a dark ride is much more passive. I think that Disney was the greatest artist of the century and also a horrible human being. The films, the good ones, exist as good cinema by themselves, you know, *Snow White*, *Pinnochio*. Those are just fine. He had film down by the time he started the parks. The parks -- he really knew what was happening. He may not have known that it was going to happen digitally.

JM: The problem there, too, is that in fact he was a horrible human being, and these dream worlds he created, whether in film or in theme parks, are escapist sites for capitalist consumption.

BD: I don't really buy that.

JM: For his company and the promotion of, frankly, a kind of American and certainly Western ideology. Really, every practice is situated, inscribed ideologically and economically. It just is. That's why I'm concerned with VR and how it's going to be situated and who's going to control it. What narratives are going to be written and selected? Who is going to appear in them? Who is going to have access to this virtual reality? There are just whole *huge* questions hanging around this new technology, and I'm again concerned with the political issues surrounding it and the producer who makes it, and all of these questions are not answered. It is new and that's understandable, but when I look at what Disney did... A lot of people question the Disney paradigm and Disney culture, and a lot of people don't like it and feel it's escapist. Look at how it's managed and who works there. It's the most rigidly controlled industry and a promotion of a hetero-sexist, basically white ideology. It

is very deeply disturbing. If he's your model it's problematic.

BD: Okay, let's take the buttons off the foils. I'm going to answer the second question first. But I do have to warn you that at the mere mention of the word Disney, you have to realize we're going to run into another 120-minute high-8 tape because this is a subject that deserves a thick book in itself.

JM: We don't want a thick book. We want a clean, economical reply, unlike your discussion of every medium and its particular narrative capacity a minute ago.

BD: I'm going to answer the second question about VR first because that's the more important one. In terms of who'll have access to Virtual Reality, in term of who'll decide, who will create these worlds, all of those things. Let's grant for the moment that Disney culture is completely wrong-headed and destructive.

JM: No, I'm not saying that. I'm saying it's a mixed bag.

BD: Let's even say that it is bad, that it's a Knox Berry Farm created by Neo-Nazis, whatever. The reason that this becomes a problem right now is that these theme parks are incredibly expensive to create. If you try to create something like virtual reality in the real world using real humans to run the thing...

JM: VR will ultimately be cheaper and more easily accessible. It could be in a video arcade.

BD: Exactly. VR will give the lonely hacker as much power as Disney had when he was starting out.

JM: It's exciting to think of.

BD: It is like saying a video camera gives you almost as much power as Orson Welles had.

JM: Not really. One doesn't have the same means of distribution. Disney's visions were circulated around the world.

BD: Distribution is also getting easier, though. For all I know, as many people see Public Access as saw the first movies when they came out. This is an incredible weapon to be able to be put in everybody's hands, this video technology, likewise with VR. Now, in terms of Disney...

JM: Look, it's simplistic to say that Disney's totally destructive. I was just saying that it's a fascinating phenomenon. I was saying that when you mention he was an awful person, you can't just dismiss that, and you can't dismiss Disney World and its awfulness and the ideologies it was promoting and still promotes.

BD: I'm not thrilled with that stuff either. I do however think that a lot of people like me have certainly gone to Disneyland and it didn't really change their ideologies that much.

JM: The point about ideology, Brian, is not that it changes one's ideology. Ideology is what we are inscribed *in*. It affirms itself through us.

BD: But Disneyland also affirmed my *alternate* ideology. Think about the Cinderella ride, which is completely drug-based. Think about all the people who go to Disneyland on mushrooms. Think about the sort of wonder and admiration that it's capable of evoking in small children. I would say that what Disney is, ultimately, in the theme parks, is the first secular trans-national state, a trans-national culture. Disney created a

culture which is more pervasive and more significant than the cultures of many countries, like it or not.

JM: You're right. I'm just saying that's the potential danger of it, that it's its own culture, conceptually structured on the status-quo of American society of the 1930's or whenever. It transformed it but it's also utterly rooted in it. It perpetuates that hokey ideology.

BD: I would say one other thing to that. One thing that he did do that isn't discussed very much is that he legitimized play and fantasy, a child's-eye view of the world, to a degree that had never been done before. I'd be willing to bet that he ultimately had a good effect, in the sense of really bringing that fairy-tale-life into a big position in the world. That might not have happened otherwise.

Let me just go back to something from a previous discussion. Anti-illusionism is an important tradition in the avant-garde because people too often take the concept for the thing. They're into religion or some bogus thing like that, so that critical tradition is very important. But there needs to be something of interest to replace the things that are destroyed by this important tradition of skepticism. And there has to be a pleasure imperative to counteract the Puritan backlash against artifice.

JM: Certain kinds of pleasure offered.

BD: Sure, it could even just be good design. It could be as simple as that, or it could be something more complicated.

JM: If you are always unveiling and critiquing it can get a little dreary after awhile. I'll buy that.

PRE-HISTORY OF VR

Simon Penny

PREAMBLE

In the face of chrome-plated futuristic technophile rhetoric, it becomes clear that aspirations to a technology which is now being formulated as interactive digital audio and video representation have been present in our culture for centuries, and the philosophical roots of this quest go back further. Jaron Lanier is reported to have said that virtual reality is the culmination of culture, and he may well be right, not in any apocalyptic sense, and not in the sense of a pinnacle, but in the sense that VR realizes deep and ancient yearnings of (specifically) Western culture. Virtual reality, like any other technology, is embedded in a cultural history which lends to the enterprise a worldview. In the words of Steve Kurtz: "We've been in virtual reality for a long time."

William Gibson's expostulation that "the body is meat," which has become the catchcry of every cyber-nerd, is a deeply Christian idea. Mortification of the flesh, and in general the denial of the body, are central to the Christian doctrine which has formed the basis of western culture for nearly 2,000 years.

As computer engineering is engineering, its world-view is that of the industrial revolution. The industrial revolution itself owes its origin to the application of empiricism, positivism, and rationalism to the systems of production of goods, to commerce.

One might therefore argue that the lineage of VR passes through the family of Constantine, Leonardo, and Descartes. Rene Descartes is pivotal, as the clearest enunciation of the separation of mind and body

belongs to him. He is responsible for the deep wound which western culture is only now beginning to recover from. But, contrary to their claims, it is not the developers of VR who are healing that wound.

In the following pages I will elucidate some of these outrageous claims.

RENAISSANCE HUMANISM

The developers of VR have, perhaps 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. Asian imagery offers us alternative ways of looking or of picture construction; Medieval European imagery offers another. Television offers a third, with its multiple viewpoints and rapid cuts which dissolve the body.

What if VR had developed along principles other than Renaissance humanism? Could we feel we could inhabit it at all? How much is any so-called VR dependent upon culturally acquired knowledge in order to be decipherable? Western perspective, or any system of pictorial representation, is in no sense innate, but a learned (often arduously) convention. But this is much more than a drawing technique. Inscribed onto conventions of Renaissance perspective is a system of values which place the viewer at a single authoritative location. The power of the gaze. Virtual reality has taken the limited technology of Renaissance perspective (limited because it only works for a 10-15 degree angle of view) and has wrapped it right around the (powerful) viewer.

A recent article on Indian dance 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 with the realm of the body, comfortable with dimension and gravity, all ease, all centered." The author described the attitude of the dance teacher to the body "... no sense of elevation or extension... body

self-contained ... inwardness, inwardness ... in Hinduism," said the teacher, "there is no beyond." Compare this attitude to that inherent in VR. The corporeal sense of touch requires immediate physical contact with the object, not so the eye. VR arms the eye, it allows the eye a hand of its own, propelled (appears to be propelled) by the gaze itself. The primacy of the visual: action at a distance, the authoritative viewpoint of Renaissance pictorial space. The entire body is propelled by scopic desire.

VR, as currently formulated, is a direct continuation of the tradition of illusionistic pictorial representation which was already in evidence in Pompeii. It was rediscovered in the Renaissance along with classical optics. the two became integral ideas in the formulation of the Renaissance humanistic world-view, a view upon which our contemporary culture still depends. In the following centuries, illusionism became technologized, first through the use of optical drafting devices (cameras lucida and obscura) and through the development of photography, both mono- and stereo-scopic. This drive to 'complete' illusionism gained a time dimension with the development of cinema.

Parallel to this technologizing of illusionism is the long tradition of grand theatrical spectacles and of World's Fairs, amusement piers and theme parks: these present another continuity of increasingly sophisticated simulation.

This desire for the spectacular, the simulated, runs deep in western culture, and has always been carried as far as the available technology would allow. The following loose string of historical examples will serve as viewpoints from which VR might be considered.

Grand theatrical spectacles were regular occurrences throughout the Renaissance and the Baroque. In 1548 the Queen of Hungary welcomed Philip II of Spain with a grand two-day event spectacle which began as a dance tournament. During the dance, 'savages' attacked and carried off a number of the women when repelled. The next day 'knights' attacked the castle in which the 'savages' had barricaded

themselves. In the middle of the raging battle that ensued, Philip was served a banquet by nymphs and naiads.

Baroque ceiling painting must properly be included in this history of technologies of simulation. The vertigo-inducing draughtsmanship constructs for the viewer the sense of 'peering up into heaven,' while simultaneously dissolving the physical architecture. This historical utilization of advanced simulation technologies by the church to present a persuasive representation of realities other than those we experience day to day is a clear example of the long interest of the Church in virtual reality.

The latter part of the nineteenth century saw an extraordinary explosion in invention in technologies we might call proto-cinematic. It was not until 1838 that Wheatstone, the British scientist, built the first stereographic image-projection system. The first multiple-user stereographic projection system was exhibited in Lyons in 1890. Along with the well-known time-lapse photography of Marey and Muybridge, Edison's kinetoscope and the cinematograph of the Lumiere brothers; numerous more-or-less bizarre optical/mechanical theaters were constructed.

Daguerre's Diorama was one such mechanized theatre, in which the audience was propelled on a revolving viewing platform past enormous scene paintings that were painstakingly painted with different degrees of transparency, such that by controlling lighting from the front and the back, the illusion of the transition from daylight to dusk to night could be effected. After a faltering career as a hack realist and theatrical scene painter, Daguerre found great success in this invention, the revenue from which funded his photographic experiments.

The World Exhibition in Paris in 1900 sported several of these optical mechanical theaters. The Mareorama simulated a sea-voyage from nice to Constantinople via Venice. During the simulation, two screens, 40 feet high and 2500 feet long, were unrolled while the viewers stood on a pitching ship's deck. The inventor of this system was yet another minor realist painter, Hugo d'Alesi, who spent a year on board ship painting

sections of the screens. A contemporary newspaper report trumpets: "Few visitors to the Exhibition will be able to resist the temptation...to make an inexpensive voyage which involves no hazards whatsoever, yet is so natural ... even on the high seas, amid raging elements, one can get out and tread on terra firma at any moment."

Another mechanical theatre at the Exhibition was a simulated trans-Siberian Railway. The Railway was placed strategically nearby the Russian and Chinese pavilions and was built by the Compagnie Internationale des Wagons-Lits. There is recognizable here a certain historical continuity in the utilization of high-tech for corporate PR. The EPCOT scheme is not significantly different.

About the same time, the scholarly Marquis de Selby seems to have been engaged in experiments into a more truly 'virtual' tourism:

> During his stay in England, he happened at one time to be living in Bath and found it necessary to go from there to Folkestone on pressing business. His method for doing this was far from conventional. Instead of going to the railway station and enquiring about trains, he shut himself up in a room in his lodgings with a supply of picture postcards of the areas which would be traversed on such a journey, together with an elaborate arrangement of clocks and barometric instruments and a device for regulating the gaslight in conformity with the changing light of the outside day. What happened in the room or how precisely the clocks and other machines were manipulated will never be known. It seems that he emerged after a lapse of seven hours convinced that he was in Folkestone and possibly that he had evolved a formula for travelers which would be

extremely distasteful to railway and shipping
companies.

TECHNOLOGICAL UTOPIANISM

The technophilic rhetoric characteristic of VR, like other aspects
of VR, is not new. Utopian techno-hype seems to have been an aspect of
technological PR since the beginning of the industrial revolution, as is
evinced by this piece of nineteenth-century doggerel:

> Lay down your rails, ye nations near and far --
> Yoke your full trains to Steam's triumphal car.
> Link town to town; unite with iron bands
> The long-estranged and oft-embattled lands.
> Peace, mild-eyed seraph -- Knowledge, light divine,
> Shall send their messengers by every line...
> Blessings on Science, and her handmaid Steam!
> They make Utopia but half a dream.

Theodore Roszak notes that "salvational longings ... entwine
themselves around new technology" and give rise to artistic pinnacles
such as these. This verse is a capsulation of the Enlightenment calculus:
Peace, Knowledge, Science, and Technology sum to Utopia.

Thomas Edison imagined that his phonograph would find its niche
as acoustic 'happy snaps,' a way of preserving the voices of beloved
relatives after they died. He had no conception of the uses that
corporate capitalism would put his invention to: ie. the music commodity
industry. Bazin makes similar observations regarding the cinema: "Those
who had the least confidence in the future of the cinema were precisely
the two industrialists Edison and Lumiere. Edison was satisfied with just
his kinetoscope and if Lumiere judiciously refused to sell his patent to
Melies it was undoubtedly because he hoped to make a large profit for
himself, but only as a plaything of which the public would soon tire."

Brecht eulogized over the emancipator potential of radio. Television, contrary to the idealistic rhetoric of its early years, evolved not into an ideal democratic information network, but into a fantastic way to sell commodities and inculcate values. VR has inherited the liberationist, democratic rhetoric that has surrounded these previous waves of new technologies. Sadly, in these cases, the rhetoric stands as a brief counterpoint to institutionalized application of these technologies, which tend to result in a greater degree of domination, manipulation, and control. We must recognize that the current condition of utopian euphoria for VR represents a stage in the familiar history of the development of technologies in a laissez-faire capitalist economic context. The utopian rhetoric, no matter how heartfelt by the inventor community, is ultimately very useful PR for the corporate merchants.

At the now legendary Virtual Reality panel at SIGGRAPH '91, VR 'came out,' at least to a community of '25,000 of its closest friends,' as SIGGRAPH people like to refer to the conference. During question time, I suggested to the panel that, to my knowledge, there had never been a case in the history of the world when a ruling group did not avail itself of the most advanced technology in order to remain in power. I was not particularly surprised when the question was politely sidestepped.

It is common knowledge that tobacco and junk food corporations pay substantial amounts of money to have their product appear in Hollywood movies. Back in the '70's Richard Serra noted that in order to receive the delivered television broadcasts, the consumer pays $40 dollars for every dollar invested by the networks. In the face of this, only a fool would wallow in the illusion that virtual reality will be any different. One can imagine possible Disneyland-style consumeristic virtual worlds with interactive and quasi intelligent cans of coke and cuddly giant hot-dogs with sexy giggles. A virtual supermarket where the products lean out at you from shelves imploring you to buy them, explaining how you will be happier, healthier, sexier, wealthier...

In terms of corporate economics, VR serves the computer industry very well. It is intuitive (no learning curve, no consumer resistance) and

calls for unlimited computer power. It thus fulfills the industries' need for Technological Desire. The transference of libidinal desire onto fetish objects which offer the promise of ecstasy but never finally consummate, driving the consumer to the next purchase in an unending coitus interuptus.

CONSUMER CULTURE

As early as 1967, Guy Debord observed that in modern societies: "... all of life presents itself in an immense accumulation of spectacles. Everything that has directly lived has moved into representation." He quotes Feuerbach: "But certainly for the present age, which prefers the sign to the thing signified, the copy to the original, fancy to reality, the appearance to the essence ... illusion only is sacred, truth profane. Nay sacredness is held to be enhanced in proportion as truth decreases, so that the highest degree of illusion comes to be the highest degree of sacredness:

VR is doubly virtual at this point: the hard technology exists, yet is only in its infancy. But this is precisely the proof that our culture yearns for it. VR has lingered pre-natally in Sci-Fi and the Star Trek Holedeck for a generation or two but now it is being born.

VR will slip frictionlessly into our culture because our culture has prepared us for it. I have suggested that every significant media technological development since the Renaissance has been employed to create theaters of simulation. This idea was not lost on Andre Brazen, 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, unburdened by the freedom of interpretation of the artist or the irreversibility of time."

This readiness for VR has been prepared (most recently) by

Disneyland, Hollywood, Liposuction and Nintendo. Conceptually vacuous theme parks, anesthetizing cinema, interactive games that perpetuate the myth of the individual and the cult of violence-as-liberty. And perhaps most significantly, the acceptance that the body may be customized at will like some kind of Hotrod. This culture customizes its bodies like it customizes its cars. The body is a representation only, 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. The attitude to the surgical customizing of the flesh, "body sculpting" and the designing of the virtual body both assume and reinforce the Cartesian duality by restating the body as pure representation. Thus VR is an easy step because the body is already a representation. 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.

How real is VR? The cultural underpinnings are already in place to lubricate the general acceptance that VR does adequately represent 'reality'. TV and cars have done it. To a culture that thinks you can 'experience' the countryside from an air-conditioned car travelling at 60 mph: very real. There is a politics of experience here. The much bandied 'electronic LSD' is, as Jaron Lanier, one of the pioneers of civilian VR, rightly states "its an incredibly stupid idea." As I recall, LSD mysticism was all about experiencing the 'real', the real within the real or whatever: "Be here now." VR is as real as a picture of a toothache. A reality in which you can walk through walls with impunity, a reality which has no odor or temperature isn't very real. And construction of more and more complex and expensive interfaces is beside the point.

There is a paradoxical aspect to increased verisimilitude of simulation: as the representation becomes increasingly complex, the gap yawns: the greater the precision only more clearly defines the ways and degrees in which the representation will not stand for the reality. This is all rather reminiscent of Arthur Dent's tea dilemma: "After a fairly shaky start to the day, Arthur's mind was beginning to reassemble itself

from the shell-shocked fragments the previous day had left him with. He had found the Nutri-matic machine which had provided him with a plastic cup filled with a liquid that was almost, but not quite, entirely unlike tea."

MIND/BODY SPLIT

One of the claims made by VR is that it constitutes a liberation from the mind-body duality. It is argued that VR achieves this by sidestepping the process of translation into, and out of, symbolic representation. This is called post-symbolic communication by William Bricken and others. The claim is, in my view, questionable. My sense is that it reinforces the Cartesial duality, replacing the body with a body image, a creation of the mind. As such it is a clear continuation of the rationalist dream of disembodied mind, part of the long western tradition of denial of the body.

Lanier argues that "the way that you talk to your body doesn't use symbols." Fair enough, but what is then suggested to be a logical corollary doesn't follow: " you can make a cup 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". But a cup in VR is a representation, and thus just as subject to critical analysis as any other representation.

Now it is fair to say that the possibility of handing a co-participant in a shared VR a virtual object in the shape of a hyperbolic paraboloid is a more directly communicative gesture than to offer a written algebraic equation which must be decoded by the mind of the receiver. The virtual form is doubly useful as the object is itself a virtual representation of precisely that data encapsulated in the equation, and this mathematical information remains available. A plaster cast of the same form does not offer this fluid access to information. In fact William Bricken maintains that all the operations of symbolic logic can be performed in VR without resource 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 that is non-symbolic and totally math-rigorous! Binary logic can be represented as open or shut doors, knot theory as fish swimming up stream over dams. "All computation is algebraic matching and substitution (proven)". What is required is a new critique, a new way of thinking about the meeting point between the immediate physiological reality of the body as lived in, and the critique of representation.

DOUBLE BODY

Although some military and industrial simulator systems utilize force-feedback or hydraulic motion simulation, the available "civilian" systems synthesize only the visual and auditory sense inputs. But we live in our bodies, and a large portion of our sense of "being in the world" is derived from our internal body senses, the sense of balance and the kinesthetic or proprioceptive sense in particular; not to mention the body surface senses that relate temperature, texture etc. A fully simulated 'body' experience would need to simulate all these senses, but this is way beyond the range of current technologies. Thus virtual reality technology splits the body in two partial bodies: the corporeal body and an (incomplete) electronic 'body image.' In terms of the rhetoric there is no question which is in the ascendant. This is kind of sensory apartheid. A confirmation, rather than a liberation from, Cartesian dualism. The body representation of VR is, in this sense, a culmination of Western culture; the Christian abhorrence of the body is structurally built in to the style of the interface, while the "powerful gaze" 'of the renaissance controls interaction. A powerful eye mounted on a fractured body.

Works cited:

'The Cosmic Dance,' Ross Wetzsteon, *Village Voice* Feb 11, 1992 pp. 95.

Victorian Inventions, Leonard DeVries. John Murray 1971 p. 126.

The Third Policeman Flan O'Brien, Plume 1976, p. 51. O'Brien is here referring to an episode related in Hatchjaw's *Da Selby's Life and Times*.

The Illustrated London News, quoted in *The Cult of Information*, Theodore Roszak, Pantheon, NY 1986. p. 45.

'The Myth of Total Cinema', in <u>What is Cinema</u>, volume 1, Andre Bazin. University of California Press 1967 p. 22.

'The Radio as an Apparatus of Communication', Bertold Brecht. Reprinted in *Video Culture, a Critical Investigation*, ed. John Hanhardy. Visual Studies Workshop/Peregrine books 1987.

William Boddy has recently presented a study of the transformation of the rhetoric surrounding early radio in "Proto-VR: archeologies of electronic vision and the gendered spectator," Society for Cinema Studies Conference, 1992.

cf. Richard Serra's video work: *Television Delivers People*, included most recently in the Image World show at the Whitney, curated by John Hanhardt.

Discussions with Ron Kuivila (personal notes).

Society of the Spectacle, part 1. B&R 1983.

Feuerbach, preface to the 'Second Edition of The Essence of Christianity,' quoted in *Society of the Spectacle*.

'The Myth of Total Cinema', in *What is Cinema, Volume 1*, Andre Bazin.

University of California Press 1967 p. 21.

The Hitchhikers Guide to the Galaxy, Douglas Adams p. 203.

'Revenge of the Nerds,' *Afterimage V18* #10 Tim Druckery interviews Jaron Lanier.

William Bricken, *Siggraph '91* (personal notes).