

## Bill Seaman

Bill Seaman received a PH.D. from CAiiA, the Centre for Advanced Inquiry In The Interactive Arts, University of Wales, Newport, 1999. He holds a Master of Science in Visual Studies degree from the Massachusetts Institute of Technology, 1985. His work explores text, image and sound relationships through technological installation, virtual reality, linear video, computer controlled laserdisc and other computer-based media, photography, and studio based audio compositions. He is self-taught as a composer and musician. His works have been in numerous international festivals where he has been awarded prizes such as the Prix Ars Electronica in Interactive Art (1992 & 1995, Linz, Austria); International Video Art Prize, ZKM, Karlsruhe, Germany; Bonn Videonale prize; First Prize, Berlin Film / Video Festival, for Multimedia in 1995; and the Awards in the Visual Arts Prize. Selected exhibitions include 1996, MEDIASCAPE GUGGENHEIM, New York; the premiere exhibition in 1997 of the ZKM in Karlsruhe, Germany; 1997, Barbican Centre (London); 1997, C3 - Center for Culture & Communication, Budapest, Hungary ; in 1998, PORTABLE SACRED GROUNDS, NTT-ICC Tokyo; BODY MECHANIQUE, The Wexner Center, Columbus, Ohio, 1999. He recently collaborated with the Dancer Regina Van Berkel on the installation entitled Exchange Fields which was commissioned by Vision Ruhr exhibition, Dortmund, Germany. He is currently Professor in the Department of Design | Media Arts, UCLA where he is exploring issues related to the continuum between physical and virtual/media space. He is also working on a grant from Intel to create a computer-based Hybrid Invention Generator.

Conscious Reframed III

## **Motioning Toward the Emergent Definition of E-phany Physics**

**Bill Seaman**

**E-phany Physics** is an authored poetic physics. An **E-phany Physics** is defined by an author/programmer, encoded to become relevant within a constructed computer-based environment and need not adhere to the laws of actual physics. A computer-mediated environment may be actuated through differing constructed interfaces that enable a set of relational media-artifacts to be made to appear in a consistent manner. An **E-phany Physics** can define the relative “appearance” of the behaviors of virtual objects and/or characters as they are interacted with in a virtual space.

Keywords: E-phany Physics, Artificial Physics, Energy Related, Emergent, Virtual Environment, Electronic, Experiential, Experimental, Interface

## Motioning Toward the Emergent Definition of E-phany Physics

I was searching for a name for a poetic sub-branch of artificial physics or a new branch of Pataphysics (Jarry, 1965, p.192) that I have been interested in articulating. I arrived at the term **E-phany Physics**. In the light of this emerging experiential domain, "Pataphysics" can be seen as a relevant precursor. Pataphysics was coined in 1911 by Alfred Jarry in his book *Exploits and Opinions of Dr. Faustrol, Pataphysician*. Jarry developed an interesting set of ideas concerning a new science within this self-proclaimed "Neo-Scientific" novel. In this fiction Jarry presents the following definition of Pataphysics:

An Epiphenomenon is that which is superinduced upon a phenomenon....Pataphysics ... is the science of that which is superinduced upon metaphysics, whether within or beyond the latter's limitations, extending far beyond metaphysics as the latter extends beyond physics. Ex: an epiphenomenon being often accidental, pataphysics will be, above all, the science of the particular, despite the common opinion that the only science is that of the general. Pataphysics will examine the laws governing exceptions, and will explain the universe supplementary to this one; or less ambiguously, will describe a universe which can be—and perhaps should be—envisaged in the place of the traditional one, since the laws that are supposed to have been discovered in the traditional universe are also correlations of exceptions, albeit more frequent ones, but in any case accidental data which, reduced to the status of unexceptional exceptions, possess no longer even the virtue of originality.

Definition. Pataphysics is the science of imaginary solutions, which symbolically attributes the properties of objects, described by their virtuality, to their lineaments.

How interesting that Jarry would be discussing virtuality in 1911.<sup>1</sup> There is a larger contemporary context that this definition can be seen to inform. I am here concerned with the authorship of a poetic physics in virtual space.

N. Katherine Hayles had earlier conversed with me about the new field that I was trying to define, suggesting the term *Artifactual\* Physics*. She was using this term in relation to one of Karl Sims works. She states: "...creatures evolved who achieved locomotion by exploiting a bug in the way the conservation of momentum was defined in the world's artifactual physics." (Hayles, 1999) *E-phany Physics* could be seen as a poetic sub-branch or abstraction of *Artifactual physics* — an abstraction of an abstraction of an abstraction. Where her term sought to articulate the exact modeling (or inexact in this case) of physics for employment in a particular artificial life

simulation, I am here interested in exploratory applications of modeling in the generation of a poetic artificial physics.

In her text entitled “Simulating Narratives” (Hayles, 1999) Hayles discusses some of the images from a video documentation related to a paper by Karl Sims work entitled “Evolving Virtual Creatures.” (Sims,1994) Hayles here states “The conjunction of processes through which we come to narrativize such images clearly shows that the meaning of the simulation emerges from dynamic interactions among the creator, the virtual world (and the real world on which its physics is modeled), the creatures, the computer running the program, and in the case of visualizations, the viewer watching the creatures cavort.” (Hayles, p.4) Hayles described the attributes from physics that were modeled to inform the behavior of the creatures. She states “Behaviors take place within an environment which includes (computer-based models of – emphasis Seaman) friction, inertia, momentum, gravity, light, three-dimensional space, and time.” (Hayles, p.4) Unlike like this approach, I have been interested in exploring attributes related to artificial physics which might be used to inform the authorship of virtual environments in a differing poetic manner. This is not to state that there is not a poetics to Sims work – I am exploring a slightly different approach to the poetics. More importantly I am interested in this as a field where many artists would take differing approaches in defining the physics-related properties to be potentially authored in computer-mediated environments.

An intuitive understanding of the physics of our lived environment becomes second nature to our knowing the world. We catch a ball, spill a drink, float in water, slip and fall down, ride a bike, bang our funny bone, drive a car, all through a felt awareness of the dynamic ramifications of motion. We can translate our understandings and observations about the physicality of environments into computer-based codes that are presented through various forms of interface, which in turn can potentially facilitate palpable experience. Computer-mediated environments enable such encounters through interactivity and/or observation. As differing modes of interface become more sophisticated, the potential is to author environments informed by abstracting different observations related to attributes of the physical environment as well as to generate new forms of relation to the world at large. Qualities and attributes of physical behavior gleaned from lived experience can be mapped onto the encoded reactive behavior of media-objects within virtual environments. Three dimensional space, 3D objects, 3D terrains, images, text, music and sound can all be connected with reactive and/or interactive behavioral attributes. The relation

between an actual physics and an authored artificial physics is constructed and becomes experiential to the participant within such environments through multiple sensual means.<sup>2</sup>

I am not a physicist. I am an artist interested in the potential of authoring media-behaviors, virtual environmental artifacts and physical stimuli that can be encountered through dynamic interaction with authored/responsive computer-based environments. These spaces are assembled to explore various environmental process-based computer-generated artifacts. One must first point out that many people currently authoring virtual environments will say that what I am writing about is not an artificial physics but media behaviors [Conversations with Rebecca Allen and Ted Krueger]. I will here argue that it is relevant to consider the ramification of a techno-poetic artificial physics. When a holistic environment can exhibit reactions to the input /behavior of a participant, the reactive experience generated through computer-based agency can take many forms. One authors the laws of how the artificial physics of the situation will be articulated, eliciting appropriate computer-generated responses. If we take the set of attributes modeled by Sims above and abstract or displace them, a very different kind of resulting image-space will emerge i.e. consider the ramifications on the virtual space if the authored code changed the gravity, altered the friction, enhanced the inertia, accelerated the momentum, etc. Imagine if the rules of the artificial physics were localized within the environment — in one location one artificial physics would be in operation, after moving a different set of artificial “laws” would be invoked [imagine the gravity on the Earth compared to the gravity of the moon...]

There are a number of fields which model the physics of particular environments within computer-based space. The code-based originators of these differing models usually seek to adhere to the physical laws of actual space in the authoring of relevant code. The subsequent media behaviors that are produced through this authorship also seek to adhere to these encoded physical laws. In relation to this approach I am interested in exploring the abstraction or poetics of the authorship of such code-based laws in the generation of virtual space and/or media installations. The code-based authoring of an artificial physics which is consistent within the virtual space, yet does not adhere to the laws of actual physics, becomes a central focus. Instead of sticking to the physics of reality, I am interested in exploring a techno-poetic artificial physics which abstracts and encodes particular consistent laws of media-behavior as an authored artificial physics. I have arrived at the term **E-phany Physics** for this authored poetic branch of artificial physics. The dictionary states that phany – is “from the greek term *phainein* , and means “**to appear** – a terminal combining

form meaning **appearance** -- as in **epiphany**.” Phany, make sense in that I was generating the appearance of a physics in virtual space via specific code authoring. The “E” of E-phany Physics can have many meanings in the same way that one might approach the poetics of an artificial physics in a number of different ways. Thus an **E-phany Physics** is a poetic physics where the authored “appearance” can be energy related, potentially emergent, virtually environmental, electronically produced, experiential and experimental.

An **E-phany Physics** is defined by an author/programmer, encoded to become relevant within a constructed computer-based environment and need not adhere to the laws of actual physics. There are a number of artists and researchers that are relevant to this concept and I will here outline a diverse set of relations that inform this research.

**E-phany Physics** is the art/science of a physics which is authored with a computer-based system, conjoining an actual space with a virtual or illusion-based space — this may also be a psycho-acoustic space. A computer-mediated environment may be actuated through differing constructed interfaces that enable a set of relational media-artifacts to be made to appear in a consistent manner. The sensual stimulus generated through interaction with such environments can be more or less palpable. An **E-phany Physics** can define the relative “appearance” of the behaviors of virtual objects and/or characters as they are interacted with in a virtual space. Although such an artificial physics is authored, the illusion of such an environment can be articulated back into physical space through various forms of haptic stimulus — imagine Alice in Wonderland rendered physical... Thus an odd co-mingling or superimposition of virtual artificial physics and actual physics can be explored. There is always an actual physics which becomes involved in the production and transmission of the artificial physics to the participant. This points back to Jarry’s “science of that which is superinduced upon metaphysics.”

The work of Margaret Minsky opens a rich field of exploration of haptic feedback — one of her works emulated the differing forces produced by the stirring of alternate “virtual” liquids through a computer-mediated haptic display . [see Minsky’s set of haptic references below].

Authored agents may be programmed to exhibit specific behaviors that operate within a larger set of constraints or artificial physics. In the alife work of entitled “Emergence – (exact title?)” – by

Rebecca Allen, a haptic “joystick” interface translates the virtual behavior of an agent into actual physical motion transmitted into the hand of an interacting participant.

Different kinds of registering of the physical behavior of a participant can be brought about and impact the authored reaction of the virtual media-environment — voice recognition (complex sound stimulus), motion recognition (complex movement stimulus), physical interaction – space-mouse or other input device... any sensor-based translation can be mapped through code to be rendered (or become functional) in relation to an authored E-phany physics in a virtual space or computer-mediated environment.

The authorship of complex interactive environments will in time become more subtle. Environmental relations move in a continuum between physical and virtual space. Marcos Novak has mentioned this concept in relation to his thoughts on “Transarchitecture.” (Novak. 1998, p. 118)

E-phany physics can produce environmental artifacts that may be textual, sonic, imagistic (media related) or alternately can produce environmental artifacts that can stimulate the senses in some manner i.e. generating a haptic response, an environmental change like temperature, the production of odor, a fluctuation in the quality of light, a movement in the physical surrounding architecture, a robotic relation as in telepresence etc. This is where the poetics of authored response introduces an exciting branch of authored potential relations.

It is a goal to create an environmental system where a palpable continuum is exhibited between the actual physics of movement of a vuser (viewer/user) and the authored techno-poetic physics of response. Our bodies and intellect quickly adapt to this new **E-phany Physics**. I believe this will become a central issue in the aesthetics of virtual computer-based works of art. One abstracts aspects of the intuitive understanding of an actual physics to inform the behavioral parameters of an individualized interactive system. We could say that after experiencing an **E-phany Physics** for a period of time, then we have expectations about that environment that become learned.

As we begin to build tools for authoring new computer-based environments, we need to be aware of the potentials of **E-phany Physics**. Many software packages already include parameters which enable one to begin to explore this kind of “abstracted” artificial physics.

One must also remember this can also potentially be an inconsistent physics which is consistently applied to an environment. One is reminded of cartoons where at one moment there seems to be gravity and at another moment there is none — picture the anvil falling, then being suspended in mid-air, then continuing its fall in the Road-Runner series...

Perry Hoberman was skeptical of there being a “physics” of virtual space. In conversation he stated that “Humor is the physics of virtual reality” and later qualified that statement stating “slapstick is the physics of virtual reality.” This is potentially the case as brought about through the authorship of a specific humor-based E-phany Physics.

One could also develop an E-phany physics that constantly changed... An environment having this kind of artificial physics would be highly disorienting.

There are numerous research fields where abstracted ideas related to artificial physics are currently being explored. Certainly consciousness is dynamically tied to a history of patterns of experience within the physical environment. We are now at a point where new kinds of experiential relations can be authored in a palpable manner and thus the ramifications of how **E-phany Physics** impacts on consciousness becomes a central concern for new forms art production and consciousness studies.

In the Virtual Reality work entitled **The World Generator / The Engine of Desire** (1995-98), made by myself working in collaboration with Gideon May, programmer, behaviors can be attached to differing media-elements – text, digital images, digital movies, 3D Objects, sound objects, and texture maps. These objects move with a consistent velocity, float and circulate throughout the space, passing through one another without edge detection. A specific light quality is authored and one can edit the space by choosing from an elaborate spinning set of container-wheels exploring what I call Recombinant Poetics.<sup>3</sup> The overall **E-phany Physics** suggests a meditative liquid environment. The meaning of the space is emergent in relation to user (viewer/user) interactivity, the software and the hardware interface (translating the subtle actual movements of the hand, into navigational information). These are initial exploration into the field



of E-phany Physics. The potentials of E-phany Physics as encoded within the authoring of virtual environments floats on the horizon of an exciting new field of virtual exploration.

Allen, R (1998) Emergence, *Consciousness Reframed 2* Proceedings

DUCHAMP, M. 1989. The Green Box. In: M. SANOUILLET and E. PETERSON, eds. *The Writings of Marcel Duchamp*. 2<sup>nd</sup> edn. New York: Da Capo Press, Inc., pp.26-71.

HAMILTON, R. 1960. *A Typographic Version of Marcel Duchamp's Green Box*. Translation: G.H. HAMILTON. New York: Jaap Rietman.

HAYLES, N. (1999) Critical Inquiry Volume 26, Number 1, *Simulating Narratives*

JARRY, A. 1965. Selected Works of Alfred Jarry. Edited by Roger Shattuck and Simon Watson Taylor. New York: Random House (p.192)

Minsky, M — Sites related to Margaret Minsky's Haptic Research:  
<http://marg.www.media.mit.edu/people/marg/haptics-bibliography.html>  
<http://www.media.mit.edu/people/marg/haptics-pages.html>  
<http://www.ai.mit.edu/projects/handarm-haptics/haptics.html>

NOVAK, M (1998) "Next Babylon: Accidents to Play In," in *The Art of the Accident*, V2 Exhibition Catalogue

SEAMAN, B & MAY, G. (1995-98) **The World Generator / The Engine of Desire**. Virtual World construction system.

SIMS, K (1994) "Evolving Virtual Creatures" ACM-0-89791-667-0/94/007/0015, Paper presented at Siggraph, Orlando, Fla, 24-29 July 1994.

SIMS, Carl — <http://www.biota.org/ksims/index.html>

I would like to thank the following people for discussions related to issues surrounding this paper: Ted Krueger, N. Katherine Hayles, Nick Gessler, Rebecca Allen, Sharon Daniel, Mark Bartlett, Perry Hoberman.

\* Hayles says the term Artifactual is in circulation and that Donna Haraway has previously used the term.

- 1 Marcel Duchamp, aware of Jarry's work also articulated a "playful physics" (Duchamp, 1989, p.49) in his notes to *The Large Glass* (1915-1923). Here Duchamp describes a "frictionless sled" among other relations. Hamilton's work entitled *A Typographic Version by Richard Hamilton of Marcel Duchamp's Green Box* (Hamilton, 1960) presents a number of such notes related to a "playful physics."
- 2 See N. Katherine Hayles **How We Became Posthuman: Virtual Bodies in cyberspace, Literature and Infomatics** (Chicago, 1999) for an in depth discussion of human/computer relations.
- 3 See "Recombinant Poetics : Emergent Meaning as Examined and Explored in a Specific Generative Virtual Environment." Ph.D. thesis, 1999, by Bill Seaman, CAiiA, University of Wales College Newport.