THE BODY CAUGHT IN THE INTESTINES OF THE COMPUTER & BEYOND

Women's Strategies and/or Strategies by Women in Media, Art and Theory

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TRACING BODIES OF INFORMATION OVERFLOW

Victoria Vesna

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In an age in which we are increasingly aware of ourselves as databases, identified by social security numbers and genetic structures, it is critical for artists to actively participate in how data is visualised, organised, and disseminated. Our entire histories can be traced through a simple nine digit number promising social security, and who knows how that number is linked to the credit cards that make our POP (point of purchase culture) so "user friendly". As an artist I have been focused on exploring issues of identity in relation to 'cyberspace' and find that my work is evolving into a fascination, if not obsession, with data bodies and online mobile agents that retrieve personal data and spread it around to create a truly distributed body with no limbs. Together with my partner, Robert Nideffer, I have spent the last two years conceptualising and developing a mobile agent that I call the Information Personae (IP). IP also stands for Internet Protocol and Intellectual Property, which are key to the concept of this agent and agency in the age of information overflow. This idea came out of many discussions with people from many disciplines that agree that looking at databases in relation to agency is critical at this point in time. Archives and databases offer artists a vehicle for commenting on cultural and institutional practices through direct intervention. Working on the net with digital databases is the most accessible way to this type of work, but in no way is it disconnected from historical and political aspects of databasing people. This essay focuses practices in the medical community of reducing bodies to abstracted datasets that have informed the conceptualisation and direction of my recent work.

Art itself has been recognised by conceptualists as an institution with all the training of product production, display, and consumption, and artists have made us conscious of these issues along with historians, anthropologists and sociologists. From the beginning of the twentieth century, the art world has been slowly deconstructed and dissembled by the very artists the institutions were promoting. In parallel, communication technologies have reinforced much of this work and, as an entire new generation of artists and audiences emerge, we are bound to witness an acceleration of change. The most promising arena for conceptual work is already in place as the archives and database systems are being developed with dizzying speed. It is in the code of search engines and the aesthetics of navigation that the new conceptual fieldwork lies for the artist. These are the places not only to make commentaries and interventions, but also to start conceptualising alternative ways for artistic practice and even for commerce. Data collection has been the driving force of all computer technology development through the all-pervasive e-commerce, is the underpinning of the new marketplace. Information about ourselves is being collected invisibly and agents are developed that make the entire process more 'user friendly'. On the Internet, bodies are absorbed and lost in data, liable to all the forms of circulation, dispersion, accumulation and transmission. Our organic form with all its entropic tendencies takes on the abstraction of encoded documents and the movement of our data, our intellectual property, our identification is lost to us, it is invisible.

All living systems are arranged in a network fashion. Since the 1920's when ecologists began studying food chains, recognition of networks became essential to many scholars, in different forms. Cyberneticists in particular tried to understand the brain as a neural network and to analyse its patterns. But the structure of the brain is enormously complex, containing about 10 billion nerve cells (neurones), which are

interlinked in a vast network through 1,000 billion junctions (synapses). The whole brain can be divided into sub-networks that communicate with each other in a network fashion. All this results in intricate patterns of intertwined webs, networks nesting within larger networks**.** All attempts to simulate the brain have resulted in necessarily simplistic versions since they are inherently tied to technological limitations.

"Life," materialised as information and signified by the gene, displaces "Nature," pre-eminently embodied and signified by the old-fashioned organisms. From the point of view of the Gene, a self-replicating auto-generator, "the whole is not the sum of its parts, [but] the parts summarise the whole." (Haraway, 1998, pg. 183)

In 1944, Erwin Schrodinger (1887-1961), an Austrian physicist who developed wave mechanics and received a Nobel Prize as a result wrote a short book entitled *What is Life?* in which he advanced a hypothesis about the molecular structure of genes. This book stimulated biologists to think about genetics in novel ways and opened a new frontier of science—molecular biology. This new field unravelled the genetic code and ushered us into an age when we began perceiving our own physical architecture as 'information.' That same year, George R. Stibitz of the Bell Telephone laboratories produced the very first general-purpose, relay operated, digital computer. (Goldstein, 1993, pg. 115-116). We are now at the threshold of entering an age of biologically driven computers and can only anticipate that this will entail an enormous paradigm shift from industrial-based digital mechanics to ubiquitous computing that could become true extensions of our bodies.

Biologists such as Francesco Varela and Lynn Margulis are doing important work that explores the relationships of our own bodily architecture and our societal organisations to the underlying biological principles. An entire field of consciousness studies is questioning what we know now about neurones in our brain and their relationship to consciousness. The consideration of silicon chips linked into high-bandwidth channels as the neurones of our culture, looking to how networks have naturally evolved and comparing this to biological systems, is, at minimum, a fascinating mental exercise. But it is also an alarming trend when we look at how data of human bodies is being reduced to information that can be copied, disseminated with a sense of distance that justifies action and behaviour deemed unacceptable in society otherwise.

Great ambitious efforts are at work to map the human genome, to digitise the entire human body, as well as to digitise entire print libraries and other cultural artefacts. Donna Haraway, a cultural critic who frequently focuses on the implications of scientific practice, speaks about the new fetishism of mapping: "Map making itself, and the maps themselves, would inhabit a semiotic domain like the high-energy physicists' "culture of no culture," the world of non-tropic, the space of clarity and uncontaminated referentiality, the kingdom of rationality." (Haraway, 1998, pg. 185) Gene mapping, according to Haraway, is a particular kind of spatialisation, she calls 'corporealisation,' which she defines as "the interactions of humans and non-humans in the distributed, heterogeneous work processes of technoscience. . . The work processes result in specific material-semiotic bodies—or natural-technical objects of knowledge and practice—such as cells, genes, organisms, viruses and ecosystems." (Haraway, 1998, pg. 186)

During the 1950's and 60's strategic thinking using "systems analysis" emerged, pioneered by the RAND corporation, a military research and development institution. This was happening at the same time that the greatest discovery in biology occurred—the physical structure of the DNA. Watson and Crick explicitly described DNA in computer terms as the genetic "code," comparing the egg cell to a computer tape. This school of thought is perpetuated in even more extreme terms by proponents of Artificial Life such as Chris Langton, who speaks of separating the "informational content" of life from its "material substrate."

(Langton, 1989) As Richard Coyne notes: “Information is thought to be the essence of life, as in the DNA code. To record and break the code is to have mastery over life.” (Coyne, 1995. pg. 80)

Computers as tools have had a great influence on systems theories that are still influential. General systems theory postulated that all behaviour of any system is predictable based on analysing statistics and probability — all is determined by patterns that can be reduced to mathematical principles. The systems theory approach has been the principal target of postmodern critics such as Jean-Francois Lyotard, who addresses this in his seminal work, *The Postmodern Condition* (1979). Lyotard emphasises the totalitarian tendencies of such theories and the systematic exclusion of differences that do not fit neatly into mathematical statistics — those elements that do not comply with the system’s overall aim are suppressed in order to preserve the ideologically based unity. In these types of systems, bodies are abstracted into a collection of data, information archives that can be stored, retrieved, networked, copied, transferred and rewritten. Data bodies are viewed from a safe distance as closed mechanical systems rather than as chaotic systems, which necessarily move toward death.

Perhaps the most intriguing and in some ways disturbing trend of digitisation and data collection is turned on ourselves, our bodies. Dissecting and analysing bodies is ever present since the age of the Enlightenment, when the problem of imaging the invisible became critical in the fine arts and natural sciences**.** One of the most obvious examples of this is The Visible Human Project, which has its roots in a 1986 long-range planning effort of the National Library of Medicine (NLM). VHP foresaw a coming era in which NLM's bibliographic and factual database services would be complemented by libraries of digital images distributed over high-speed computer networks and by high capacity physical media. Not surprisingly, VHP saw an increasing role for electronically represented images in clinical medicine and biomedical research and encouraged the NLM to consider building and disseminating medical image libraries much the same way it acquires, indexes, and provides access to the biomedical literature. As a result of the deliberations of consultants in medical education, the long-range plan recommended that the NLM should "thoroughly and systematically investigate the technical requirements for and feasibility of instituting a biomedical images library."

The initial aim of the Visible Human Project is the acquisition of transverse CT, MRI and cryosection images of a representative male cadaver at an average of one-millimetre intervals. The corresponding transverse sections in each of the three modalities are to be registered with one another.

The most commonly used of these is computed tomography (CT-scan), based and magnetic resonance imaging (MRI). CT scans are based on the technique of the x-ray, but rather than providing a 'shot' from just one angle, as conventional radiography does, the scan uses a thin beam which rotates around the entire body and takes a visual 'slice' through a cross section of the body. The radiological information, instead of being developed on a photographic medium to produce an x-ray image, is translated into digital data which is then translated into visual data on a computer screen, displaying a colour coded and enhanced cross section of the body. The Visible Human data, as morphable images, enact such a reversible temporality within their aesthetic, bodies, which can be dissected, and ressected without consequence. Similarly, war simulations are imagined as ways to train soldiers with ‘0 casualty’,

In this sense the VHP figures and their cognate forms of diagnostic imaging, describe some new interiority, a projected space of private, psychic being made globally visible and available through the distributive optics of the computer or the Internet. The abolition of the bodily interior as private, or sacred, space, a process begun with the earliest systematic anatomies of the late Medieval period and extended with the abrupt application of x-rays to the body in 1895, takes on a new vigour with the launch of the Visible Human figures. (Waldby, C. 2000)

Most of this work to date has been carried out on the Visible Male data. The Visible Woman data is taken from a woman who remains anonymous and is in a post-reproductive status. Her data has been primarily used for reproductive anatomy, while the male data is considered able to adequately represent the 'human' body. Even though her data is in higher resolution, she has failed to generate the same type of interest in the public eye. Perhaps this will change when a new female data set of a younger woman is added, as planned by the VHP.

Dr. Catherine Waldby is one of the few cultural theoreticians who analyse the fascination with the Visible Humans online, linking it to our society of spectacle and the medical world's practice of unemotional databasing. She writes: "Medicine's use of data and data space is itself uncanny, drawing on the peculiar vivid, negentropic qualities of information to (re)animate its productions." (Waldby, C. 2000) Making visible the invisible in ourselves, our bodies and identities, does not stop with dissecting the human flesh into millimetre pieces, digitising and posting on the net. The human genome project goes much, much further than that.

The Human Genome Project

At around the same time that the male and female bodies were being digitised and made available over the Internet, major advances were being made in the field of molecular biology as well, and scholars were being mobilised to map the entire human genome. The prospect of digitally mastering human genome has serious potential for making it possible to identify the sources of disease and in turn develop new medicines and methods of treatment. Thus, the genome project was almost immediately a focus of interest for the private sector, who saw a great possibility for profit in gene identification, which subsequently caused them to launched their own, parallel, research efforts.

Begun in 1990, the US Human Genome Project is a fifteen-year effort co-ordinated by the U.S. Department of Energy and the National Institutes of Health to identify all the estimated eight thousand genes in human DNA, determine the sequences of the three billion chemical bases that make up human DNA, store this information in databases, and develop tools for data analysis. To help achieve these goals, researchers also are studying the genetic makeup of several non-human organisms. These include the common human gut bacterium *Escherichia coli*, the fruit fly, and the laboratory mouse. A unique aspect of the U.S. Human Genome Project is that it is the first large scientific undertaking to address the ethical, legal, and social issues (ELSI) that may arise from the project.

One of the results of the Human Genome project is cloning DNA, cells, and animals. Human cloning was raised as a possibility when Scottish scientists at the Roslin Institute created the much-celebrated sheep "Dolly" (Nature 385, 810-13, 1997). This case aroused world-wide interest and concern because of its scientific and ethical implications. The feat, cited by *Science* magazine as the breakthrough of 1997, has also generated uncertainty over the meaning of "cloning," an umbrella term traditionally used by scientists to describe different processes for duplicating biological material. To Human Genome Project researchers, cloning refers to copying genes and other pieces of chromosomes to generate enough identical material for further study. Cloned collections of DNA molecules (called clone libraries) enable scientists to produce increasingly detailed descriptions of all human DNA, which is the aim of the Human Genome Project**.** (Human Genome News, January 1998; 9: 1-2) In January 1998, nineteen European countries signed a ban on human cloning. The United States supports areas of cloning research that could lead to significant medical benefits, and the Congress is yet to pass a bill to ban human cloning.

Much of this ambition for digitised genomes is driven by excitement for a new way of thinking and working and by a utopian vision of all information being accessible to all—the vision of a collective consciousness. But this ambition is equally fuelled by the potentially huge monetary returns it could generate. The most disturbing example is research in the field of genetics led by Carl Venter, also called the Bill Gates of genetic engineering. His claim to be able to beat the government's plan to map the entire genome by four years has even James D. Watson, the discoverer of DNA, up in arms. The rush to patent genes as they are discovered has many speculating if our bodies will truly be owned by corporate interests.

It is more than a decade since the US genetic engineering company Genentech made both medical and legal history, first with the discovery of the gene that produces insulin and then by persuading a series of US courts that it had earned the right to patent its discovery. Just as digital libraries funded by governments and developed by university consortiums have their counterparts in the corporate sector, so too in the sphere of biotechnology. The Human Genome Project is funding thousands of scientists working at universities and research labs with a generous budget of three billion dollars and climbing. But the biotech world has become a type of a battlefield, with certain private companies refusing to share the genetic codes they identified and therefore claim. The case of the *Staphylococus aurues,* a deadly bacteria that resists the strongest antibiotics, is an example of this conflict. Biotechnology and drug companies have spent huge amounts of money on decoding the genome of the *Staph*, hoping to design new drugs to combat it. But they refuse to share their discoveries or to collaborate with federal health officials, forcing them to duplicate the work at a cost of millions of dollars to taxpayers. The question is still open and mirrors the one that is always looming over the Internet: Will data-body information be available and free in the public domain, or will it be patented and owned by the large corporate sector? Our bodies are numbered, our days are numbered…

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