

SELF-EUGENICS: THE CREEPING ILLUSIONISING OF IDENTITY FROM NEUROBIOLOGY TO NEWGENICS

Barbara Maria Stafford

No, it had to be sweet/as grass, the kind of stuff that's habit-/forming like all things half-conceived:/ for instance, Adam/anaesthetized, and God, part surgeon, part/cosmic dating service, / taking her out for the first time/to see how it would go (the Bible leaves this part out, / although the Greeks not believing/ in premature withdrawal, left it in)!¹

Eleanor Wilner, 'Candied'

1. Eleanor Wilner, 'Candied,' in *Reversing the Spell. New & Selected Poems*, Washington, Copper Canyon Press, 1998, p227.

2. Stella Hurtle and Phil Szuromi (eds), 'This Week in Science', in *Science*, 308, April 1 (2005): 13.9

3. For brain performance, see, Kathy Wren, 'Science, Religion Intersect at Neuroethics Forum,' *Science*, 308, May 27 (2005): 1273.

4. Marjorie Grene and David DePew, *The Philosophy of Biology. An Episodic History*, Cambridge, Cambridge University Press, 2004, pp291-303.

5. *Ibid.*, pp307-311.

6. Oliver Morton, 'Life, Reinvented,' *Wired*, January 2005, p173.

7. Dan Ferber, 'Microbes Made to Order,' *Science*, 303, January 9 (2005): 158.

Creep, scientists tell us, is 'the slow deformation of a material that occurs when it is held under a constant load, such as the gradual stretching of a piano or violin string'.² During creep in metals or metallic alloys, voids form and grow with time accompanied by fundamental changes in the original crystalline structure. This essay is about a different kind of resistless transition - not in brass but in biomedicine and brain science - whereby the organism is being 'deformed' by computational science and 'knowledge engineering' into a synthetic medium. I explore what this steady veering by the life sciences towards the model of information-processing is doing to our everyday attitudes about the body from genetics to consciousness. More specifically, I am interested in the accelerating notion of using performance-enhancing technologies to boost everything from physique to brain performance.³ In short, the argument of this essay is that information technologies are quietly, automatically, and steadily, transforming us into a culture of self-perfection from the cellular to the gross anatomical level.

Since Darwin, it has become increasingly difficult to uphold any concept of species that insists on the permanence and stability of each kind, as Cuvier could still do. If, since 1859, there has been a constant 'species problem', there has also been an accompanying erosion of the foundations of taxonomy.⁴ Contemporary biology seems smitten by visions of transmutation and transmutability far exceeding those proposed by Lamarck or Geoffroy de Saint Hilaire. Modern biology first underwent the 'biochemical' turn, then the 'molecular' turn, and now is in the process of making the 'compositionist' (synthetic) turn⁵ - raising deep classificatory, epistemological, and even ontological questions not just about the reducibility of the living to chemistry or physics but whether the phenomenon of life can be engineered.

Thus, it is not unusual to hear about 'custom-building biological systems'⁶ and ambitious plans 'to modify the whole behavior of the cell' by engineering it from the ground up 'rather than tinkering with a handful of genes or tweaking a metabolic pathway or two, as do today's genetic engineers'.⁷

Note that the rhetoric is one of constantly breaking new ground in the area of life. In this reckless company, Craig Venter's neo-Darwinian aspiration to assemble a *Whole Earth Gene Catalog* by collecting the DNA of everything on the planet does not seem extreme. He imagines a 'combinatorial genomics' using existing robotic technologies not only to collect 100,000 new species and tens of millions of new genes but to construct a functioning synthetic genome and to dream up new life forms.⁸ Nor does William Hurlbut's proposal to grow teratomas (naturally occurring monsters that grow from an egg and sperm cell but without the balance of gene expression to create an integrated organism) sound bizarre in this context. No doubt it would satisfy the Vatican and conservative theologians that this horrible hodgepodge of organs could never constitute a true embryo destined for a human 'trajectory'.⁹ But the fact that scientists would be engineering mutant non-embryos ought to produce more than repugnance. It ought to produce an articulation of the fundamental problem. That is, treating the body as discrete units divorces the parts from the interconnective system in which they inhere and work. These units thus no longer possess a history or belong to something other than the anonymous laboratory which excised, manipulated, or generated them.

Such dividing and segmenting experiments depend upon a tidal wave of data and advances in information technology - from processing power to databases to storage. During the past four decades, cloning has become merely the most visible of an encroaching series of human genetic engineering techniques (HGE). These sophisticated biological tweakings range from somatic engineering (or the intentional transformation of genes in the body) to germline engineering (extending to the descendants of an individual) through chemical manipulation. Eerily, the latter procedure works not just on one's own body in the present but determines traits in a future generation. Already, animal lovers, with the aid of a paw-sized piece of tissue and \$32,000, can replicate their deceased cat using chromatin transfer which has a much higher success rate than the nuclear transfer method used to clone Dolly the sheep.¹⁰ For those with the financial means, these technologies have already arrived.

While human cloning supposedly is not yet technically feasible, fear continues to be expressed in many quarters about the possibility of genetically engineering people and their offspring to make them bigger or stronger, age more slowly, be less aggressive, exhibit more intelligence.¹¹ Visceral reactions to the idea of changing the human species genetically connects a conservative critic of the 'formally rational' bioethics community, such as John Evans, with a liberal ecologist interested in transgender relations, such as Joan Roughgarden. Her worry as well as his, voiced in *Evolution's Rainbow*, can be summed up into the broader concern that genetic engineering threatens 'our rainbow of diversity, our species, our posterity'.¹²

While occupying opposite conservative/liberal poles, both writers nonetheless highlight a significant, sustained shift in cultural focus from common societal ends, or the relational nature of life, to the pre-eminent

8. James Shreeve, 'Craig Venter's Epic Voyage to redefine the Origin of the Species,' *Wired*, August 2004, pp149-150.

9. Clive Thompson, 'How to Farm Stem Cells Without Losing Your Soul,' *Wired*, June 2005, pp118-120.

10. 'Cloned Animals,' 'The Future of Science and Medicine,' *Wired*, June 2005, p18.

11. John H. Evans, *Playing God? Human Genetic Engineering and the Rationalization of the Public Bioethical Debate*, Chicago and London, University of Chicago Press, 2002, p3.

12. Joan Roughgarden, *Evolution's Rainbow. Diversity, Gender, and Sexuality in Nature and People*, Berkeley, Los Angeles, London, University of California Press, 2004, p306.

13. Avery Penmarun, 'Your New Immune System,' *Wired*, February 2005, p120.

14. William E. Halal, 'The Intelligent Internet. The Promise of Smart Computers and E-Commerce,' *The Futurist*, March-April 2004, p31.

15. Steven J. Bell, 'The Infodiet: How Libraries Can Offer an Appetizing Alternative to Google,' *Chronicle of Higher Education*, 20 February 2004, B 15.

16. See my forthcoming *Echo Objects. The Cognitive Work of Images*, University of Chicago Press, Spring 2007.

17. Edwin Black, *War Against the Weak. Eugenics and America's Campaign to Create a Master Race*, New York and London, 4 Walls 8 Windows, 2003, p13.

18. *Ibid.*, p428.

19. Lori B. Andrews, 'Genes and Patent Policy: Rethinking Intellectual Property Rights,' *Nature Reviews/Genetics*, 3, October (2002): 803-808.

20. Simon Head, *The New Ruthless Economy: Work and Power in the Digital Age*, Oxford, Oxford University Press, 2003.

21. Black, *op. cit.*, p429.

22. Sheila M. Rothman and David J. Rothman, *The*

rights of the *autonomous* individual. In fact, metaphors of autonomy have become naturalised and endemic to the debate across the board. Thus we are told that the goal of autonomic computing is to mimic the autonomous way the central nervous system regulates the body¹³ or that DARPA (Defense Advanced Research Projects Agency) is developing a hypersmart computer that can maintain itself, assess its performance, make adaptive changes, and respond to different situations.¹⁴ What seems remarkable to me about this exciting scenario is that we witness it in a 'shopping mall of genetic projects'. These range from designer babies to trans-species introductions in agriculture. Ironically, the 'thinning' of the total structure of the body into its contextless components can be counterpointed to rampant 'infobesity'. Is the concept of 'junk' DNA so different from the junk outcome of thoughtless Google-ising research? ¹⁵In both cases, we find the analogous valorisation of autonomy and automatism. I find it significant that in the dominant research focus of the neurosciences, cognitive science, and neurophilosophy, a wide variety of experiments and investigations are nonetheless similarly trained on understanding unconscious or subconscious processes that do not require the viewer's concentrated attention.¹⁶

We are now entering an age of self-eugenics in which improvements to human bodies and minds are becoming a primary goal in biomedical research and clinical treatment. A major contributing factor to this steady creep into code is that DNA sequences are treated less as molecules and more as information. Between 1863 and 1868, the heredity theories of Herbert Spencer, Gregor Mendel, Charles Darwin, and Francis Galton - when taken together - helped bring about a convergence of social planning, philosophy, and biology.¹⁷ But even in their wildest moments, such evolutionary concepts culminated in an ideology to improve the human race by the careful breeding of the 'best' people. They did not result in the revolutionary notion of constructing oneself into a superlative specimen. Neither an instance of 'negative' (coercive) eugenics nor 'positive' (suggesting, predicting, facilitating) eugenics, this privatised self-retooling is dominated by capital investment, patent applications, and trade secrets. Genetic elitism - linking evolution, heredity, scientific and technical progress to the most intimate aspects of life and intelligence - has given us 'newgenics'.¹⁸ As Lori Andrews notes, recent legal disputes about what kind of *substance* human genes are devolve on whether they are identified primarily as raw material or as patentable subject matter, like software.¹⁹

One has to wonder if this contemporary urge for corporeal auto-control is not being reinforced by a 'human-proof' society in which individuals increasingly feel that they have lost control over their children, their safety, their jobs, their world. Somehow the life we desire is obscured and denied to us. Even astronomy unwittingly seems to conspire with its depersonalized model of an expanding universe in which we play an ever-smaller part. Closer to home, the ruthless global 'information economy'²⁰ challenges a belief in the intrinsic worth of finite existence and the role of human autonomy. In

spite of its visionary business rhetoric, downsizing is as posthuman as the production of ‘an uninsurable, unemployable, and unfinanceable genetic underclass’.²¹ With more and more work being outsourced and people being unceremoniously sacked, the business world is mimicking the genetic world. On one hand, it appears as if the individual can physically and physiologically tailor her body to the most minute specifications. On the other hand, when it comes to one’s milieu or environment, the individual in reality is offered a dwindling set of choices over his or her fate not unlike DNA determinism.

Wherever we look, then, biological work has taken a distinctively applied turn. The ongoing efforts at reconstructing our morphological and genetic identity are set in ironic relief by overwhelming industrial workforce ‘restructuring’ whereby helpless employees are mechanically replaced by cheaper labour. It is as if conscious choice has abandoned the public sphere to rampage in the private realm: ranging from elective cosmetic surgery, to growth hormone injections, to the dream of the perfect child, to the spectre of redesigning humans.²² In this peculiar social climate where everything and nothing seems individually possible, it is not surprising that consciousness, too, has become something ‘distributed,’ dispersed, depersonalised. The mind is seen to be not just an internal information processing device (neural network) but a circuit that ineluctably spreads out into the environment to which it has been correlated and for which it has been made. Just as the individual self is taken to be a kind of intellectual property coded in gene sequences and disseminated in gene pools,²³ self-awareness is distributed across spaces, times, participants, and objects. Like the use of the passive voice in writing,²⁴ this way of imagining our most intimate self conceals agency, work, responsibility, and turns the individual into an object which has things done to it.

Paradoxically, at the same time that somatic self-production is on the rise, health care is being outsourced, handing the parcelised and powerless patient over to automated expert systems. If everything from the identification of an illness to diagnostic consultation is considered to be disembodied ‘information’,²⁵ then ‘medical management’ seems an apt term for the industry concerned with analysing, compiling, and re-engineering the data of any ailing organism. The nineteenth-century proponents of measurement, statistical accuracy, and standardisation would surely have marvelled at our unjaundiced trust in blanket quantification.²⁶ Yet, in the era of ‘genomicism’ and ‘genomania’,²⁷ one thing is certain. The body is evolving - with a lot of biotechnological assistance - whether as a biological form, a social form, a data form, or a fictional form.²⁸

Our collective attention has perhaps been drawn more to dramatic cases involving reproductive technologies or genetic counselling and the gradual change in attitude about what constitutes disease and imperfection that they document. But we can also clearly observe this shift at work at the more arcane cellular level in two telling, but randomly, selected examples taken from the burgeoning field of biotechnology. The first instance has to do with

Pursuit of Perfection. The Promise and Perils of Medical Enhancement, New York, Pantheon, 2004.

23. Jordan Paradise, Lori Andrews, Timothy Holbrook, ‘Patents on Human Genes: An Analysis of Scope and Claims,’ *Science*, 307, 11 March (2005): 1566-1567.

24. William Germano, ‘Passive Is Spoken Here,’ *Chronicle of Higher Education*, 22 April 2005, B 20.

25. Martin Zelder, ‘Optimal Regulation of Genetic Testing: An Economic Analysis,’ *Ethics, Genetics, and Pharmacogenetics Seminar*, Maclean Center for Clinical Medical Ethics, University of Chicago, 11 May 2005.

26. Graeme J.N. Gooday, *The Morals of Measurement. Accuracy, Irony, and Trust in Late Victorian Electrical Practice*, Cambridge, Cambridge University Press, 2004.

27. Jane Maienschein, *Whose View of Life? Embryos, Cloning, and Stem Cells*, Cambridge, Mass. and London, Harvard University Press, 2003, p196.

28. Donald J. Childs, *Modernism and Eugenics. Woolf, Eliot, Yeats, and the Culture of Degeneration*, Cambridge, Cambridge University Press, 2001, p65.

embryonic stem cell research and the derivation of new cell lines, whether created from left-over blastocytes or through nuclear transfer. Although controversial, the latter (research cloning) is drifting into actuality. The move to leave tough ethical questions to local, rather than national, regulatory committees monitoring in vitro fertilization of donor sperm and egg 'made specifically for research',²⁹ as well as the use of ES cells to fabricate laboratory chimeras (animals that contain the genome of a different animal in some of their cells) owes, at least partly, to treating recombinant DNA research as if it were merely the manipulation of information not of nuanced organisms.

The second instance has to do with the recent discovery that there is something special on the Y, not the X, chromosome that decides sex. But many of the details of how this SRY gene switches other genes on or off are still uncertain. Allen Orr has pointed out that it was only in 2003 that the entire stretch of DNA carried on the human Y chromosome was decoded. Yet the popular press has long and confidently asserted that sex and gender are, in fact, genetically determined.³⁰ While there are many scientific and cultural factors contributing to the creeping reduction of the subtleties of human sex determination to a sociobiological determinism, there is one, perhaps, that has not been fully recognized. This is the unwitting role played by the cipher-language of biological research as it compressively tags particular traits or characters.

My intention is not to mount a critique of the textuality of scientific nomenclature, although it is worth noting that this linguistic turn spills over into cognitive science when Ian Hacking can chide Colin McGinn to 'remember we live in a world in which imaging as a mental act is not prized'.³¹ I want to contribute to the debate about imaging in current studies on the metamorphosis of biology and, indeed, many other disciplines, into an information science. Evelyn Fox Keller, Donna Haraway, and Richard Doyle have examined both the cultural and the economic context of using linguistic metaphors such as 'DNA code,' the 'genome library,' 'text,' 'translation.' More recently, Timothy Lenoir compellingly addressed the theme of 'tools to theory,' that is, instrumentation, software, and the role of the computational medium itself in the historical (from the mid-1960s onward) theorizing of biology as an information science.³² That is, the apparatus-generated data has become the substance of biology. Similarly, in the area of design theory, John Thackara claims that we have been relentlessly filling the world with connecting devices - from body implants to broadband communications to smart appliances - without first discussing the purposes they might serve.³³ Another way of saying this is that, paradoxically, we are proliferating connecting technologies without considering their involvement with the body, memory, or tangible communities.

In short, what are the implications for a whole range of body-based social issues when bio-informatics programs are so popular that they are all over the Internet, and genes merely constitute 'a library of defined components that can be assembled into control systems for biological computation, or

29. Constance Holden and Gretchen Vogel, 'Panel Would Entrust Stem Cell Research to Local Oversight,' *Science*, 308, 29 April (2005): 611.

30. H. Allen Orr, 'Vive la Difference!,' *New York Review*, 12/05/2005, pp18-20.

31. Ian Hacking, 'A New Way to see a Leaf,' *New York Review*, 7/04/2005, p70.

32. Timothy Lenoir, 'Shaping Biomedicine as an Information Science,' in Mary Baldwin, Trudi Bellardo Hahn, and Robert U. Williams (eds), *Proceedings of the 1998 Conference on the History and Heritage of Science Information Systems*, Medford, N.J., Information Today, Inc., 1999, pp27-28. See also, Richard Doyle, *On Beyond Living: Rhetorical Transformations of the Life Sciences*, Stanford, Stanford University Press, 1997.

33. John Thackara, *In the Bubble: Designing for a Complex World*, Cambridge, Mass. and London, MIT Press, 2005.

used to program bacteria in order to produce interesting proteins and other compounds’?³⁴ Timothy Lenoir was prescient in his claim that, in the ivory tower, ‘experiments *in silico* are rapidly overtaking experiments *in vitro*’.³⁵ But his prediction that there may be no laboratory for molecular biologists to return to has taken an unexpected twist. Evidently, the era of post-academic ‘garage biology’ is now upon us, touted in the popular press as an ‘art’ that can be learned. Even more significant, this entrepreneurial enterprise can apparently be taught to robots or sold as a toy to children ten years and older (‘The Discovery DNA Explorer Kit’). Today’s situation, therefore, is not just - as Sheldon Krinsky accurately foresaw - that biotechnology is pushing universities and industry closer together commercially,³⁶ but that the intellectual world is being flattened by an encroaching and encompassing Web.³⁷

In relation to these debates, I am asking another kind of epistemological question about the nature of subjectivity and the self. How is this expanding scientific process of abstraction and fragmentation changing our conception of human identity, cognition, emotion, and behaviour? Do DNA identity, genetic identity - like credit card identity or ethnic identity - also exert pressure on the social sphere? I am thinking of identity politics where the demand for personal recognition is based, not on shared human attributes, but on respect for the individual as different.³⁸ Stating it otherwise, if the demand for a politics of recognition in the age of globalisation is not about achieving eventual inclusion within the fold of humankind, how will proximity-making electronic media, systems, and services manage to rescue the marginal from being rolled into one common, universal narrative? Conversely, how will genetic testing avoid categorising us by our unique and deep propensities? What will happen when we physically and mentally become what we create? That is, what will happen when biology slides entirely into the category of a cultural construct? Unlike the bizarre displays in eighteenth- and nineteenth-century natural history museums, the strange laboratory artefact is now the rule not the exception.

To visualize the creep from historically specific to anonymous, autonomous, and automated self, I turn in the remainder of this essay to an analysis of *Bodyworlds: The Anatomical Exhibition of Real Human Bodies* - Gunther von Hagens’ hugely popular show of flying, jumping, chess-playing plastinates. These works have been much discussed so my intention is not to mount a critique of these fascinating, if ambiguous, objects. Rather I want to situate them within the contemporary cultural context of self-perfecting therapies that forms the theme of this essay. Rendered dry and odourless by a preservation process that replaces fluids with silicon rubber, wet body and slimy organs look leathery, if flexible. Because of their uniformly desiccated surfaces, the absence of slipperiness as well as the stench of corruption, the treated bodies appear uncannily individual and ideal at the same time.

Exhibiting human remains (ranked PG 13) has been a controversial and much-debated practice, especially in the bioethical and anthropological

34. Rob Carlson, ‘Splice It Yourself. Who Needs a Geneticist? Build Your Own DNA Lab,’ *Wired*, May 2005, pp89-90.

35. Lenoir, op. cit., p43.

36. Sheldon Krinsky, *Science in the Private Interest: Has the Lure of Profits Corrupted Biomedical Research*, New York, Rowman and Littlefield, 2003.

37. Daniel H. Pink, ‘Why the World is Flat’ [Interview with Thomas Friedman], *Wired*, May 2005, pp151-153.

38. See Charles Taylor, *Sources of the Self: The Making of the Modern Identity*, Cambridge, Mass., Harvard University Press, 1989, and Sonia Kruks, *Retrieving Experience: Subjectivity and Recognition in Feminist Politics*, Ithaca, Cornell University Press, 2000. Also see Sylvester Okwundodu Ogbachie, ‘Ordering the Universe: Documenta 11 and the Apotheosis of the Occidental Gaze,’ *Art Journal*, Spring (2005): 81-94.

39. See, for example, the Symposium on *Law, Ethics and the Historical Display of Human Remains*, organized by Robert Juette and Christopher Lawrence, London, Wellcome Institute, 13-14 April 2005, <www.ucl.ac.uk/histmed>.

40. D.G. Jones, 'Re-Inventing Anatomy: The Impact of Plastination on How We See the Human Body,' *Clinical Anatomy*, 15 (2002): 438.

41. The theological implications of destroying the human form to obtain knowledge is summed up in Goethe's distinction (in *Wilhelm Meister*) between the *prosektor* (the mutilator) and the *proplastiker* (the rejoiner). See Charleen M. Moore and C. Mackenzie Brown, 'Gunther von Hagens and *Body Worlds* Part I: The Anatomist as Prosektor and Proplastiker,' in *The Anatomical Record* (Part B: New Anatomy), 276B (2004), pp8-14.

42. Jose van Dijk asked whether with such extensive chemical manipulation of the corpse how natural it could be. See her 'Bodyworlds: The Art of Plastinated Cadavers,' *Configurations*, 9, 1 (2001): 99-126.

43. See my exhibition catalogue, *Depth Studies. Illustrated Anatomies from Vesalius to*

community.³⁹ I was struck by concerted efforts at distancing the display of 'human material' from 'art' - where art was taken to be 'mere entertainment' or fabricated for 'decorative purposes'.⁴⁰ As remarkable as this rupture is - breaking the long aesthetic-medical tradition of the *anatomie moralisée* - I want to take the discussion in a different direction. First, I should say that I saw this world-touring exhibition while it was on display at the Museum of Science and Industry in Chicago. I felt then, and still do today, that these voided human specimens offer an occasion to reflect on the oddly depersonalised and distributed conception of the contemporary body. The exhibit further elicits a meditation on my central thesis, namely, the fact that the real slides into the unreal when it is hygienically processed as if it were a computer-assisted vision. I propose the paradox that these hyper real anatomies are unimaginable without the backdrop of new electronic media and the concept of both science and art as manipulatable, and thus enhanceable, information that such imaging technologies foster.

Significantly, and not unlike the elaborate bio-molecular procedures previously discussed, the elaborate process of dismembering⁴¹ and then re-engineering formerly intact human specimens takes place primarily in remote facilities, in this case in China and Kyrgyzstan. Thus small Asian bodies are vertically 'exploded' or horizontally expanded (as in running), or captured enacting a 'western' role, such as a leaping ballet dancer or a dribbling basket ball player. Equally remote in its own way is the description of the complex preservation technique used in the meltdown and reconstruction of these real, but artificial, figures. For example, we are informed with clinical detachment, and without accompanying illustration, that the decomposition of the corpse is stopped with formaldehyde or freezing. It is 'then either dissected or sawed into slices, depending on how it will be permanently preserved. Frozen body fluids are replaced by acetone in a frigid (minus 13 degrees) acetone bath. Most specimens, particularly bones and intestines, must be defatted in room temperature acetone before plastination can begin. In a vacuum chamber, the acetone is squeezed out of the specimen and gradually replaced by plastic,' with each whole body requiring 'up to 1500 hours to prepare'.⁴² This passage is simultaneously vague and precise.

The explicit violence associated with the venerable tradition of the western public autopsy - underlined in Vesalius' disembowelled cadaver stretched out on the dissecting table in the frontispiece to his *De humani corporis fabrica* (1543)⁴³ or sublimated in Frederik Ruysch's late seventeenth-century allegorical tableaux of aborted fetuses dressed in the lace of their afterbirth - is still implicit here, but buried. As is true of bio-computing, the plastinates can theoretically be made of any material as long as certain principles are fulfilled. It just so happens that these particular artificial agents are compiled from human flesh. Such abstraction serves to detach the bodies we are looking at from the lengthy tearing down and building up material operations they underwent to achieve their final appearance. No wonder, then, that despite their reality as technically-accurate images, they

do not possess the ‘roundedness,’ that is, the ensouled physical actuality and cognitive awareness, of seventeenth and eighteenth-century wax models from Zumbo to Fontana. No ‘I’ or self-consciousness ever inhabited the trepanned cranium. The motion of the limbs seems to occur automatically, without the need for the intervention of the will. Unlike the reanimation and re-formation promised at the Last Judgment,⁴⁴ this collaging and montaging of stripped down bodies happens in silicon.

The exhibition has already attracted more than 14 million viewers in Europe and Asia since the 1995 premiere in Tokyo.⁴⁵ Some twenty-five free-standing whole bodies, ranging from obese adults to toned athletes, are skinned, dissected, laid bare. These rot-less cadavers demonstrate everything from clogged arteries, blackened lungs, arborescent capillaries, tangled nerves, prosthetic knees. While these flayed living statues are not supported on pedestals or enveloped by protective vitrines - making it easy to inspect them close up and in the round - an array of sliced and sectioned livers, kidneys, gall bladders, spleens, hearts, and brains - as luminous as stained glass - are deployed in backlit cases. A separate curtained-off area contains a panorama of developing embryos and fetuses which enframe a reclining woman. Her exposed womb contains an eight-month old baby, snugly nestled amid the intestines.

Both the surrounding wall text and the press packet hover between telling a cautionary tale of self-abuse (through smoking or bad diet) or, conversely, potential self-improvement, and a more uplifting general educational message of providing insights into human anatomy. Taken together with the cleaned-up visual evidence, these combined discourses add up to a powerful rhetoric of self-fashioning. As I suggested, this re-engineering of the natural body into a synthetic more-than-body cannot be separated from the biomedica of self-eugenics. It is not accidental that von Hagens has compared the reconstitution of the limited and flawed self of the donor, as well as his super sized re-scaling (as in the bicyclist expanded to one and a half times normal size), or even creation *de novo* (the fictitious *Mystical Plastinate*), to the perfected identity bestowed on the patient by the plastic surgeon.⁴⁶ But, surely, growth hormones and nanotechnology might also be invoked.

The cloud of uncertainty surrounding these figures and the unstable illusion of autonomous structure they create forces the viewer to reflect on the tension between formed and unformed embodiment. I was reminded of Donald Winnicott’s theory of identity as inseparable from a theory of continuously performed form. Was Winnicott correct? Does reality gain intensity from surviving continuous destruction? The famous object-relations psychologist was speaking of the difficulties attending the recognition of an ‘other’ - seen as external and beyond one’s personal omnipotence (and thus subjected to continual unconscious destruction). Significantly, this stranger is brought into our consciousness only if capable of contributing something new to our lives, that is, enduring only to the extent that he or she becomes of ‘use’.⁴⁷ I want to mobilize the importance given to the role of form in

Vieq d’Azyr, On Loan from the Department of Special Collections, University of Chicago Library, Chicago, The Smart Museum of Art, 1992.

44. Charleen M. Moore and C. MacKenzie Brown, ‘Gunther von Hagens and *Body Worlds* Part 2: The Anatomist as Priest and Prophet,’ *The Anatomical Record* (Part B: New Anatomy), 277B (2004), p18.

45. Diane Haithman, ‘Exhibition on the Human Body Gets Under People’s Skin,’ *Los Angeles Times*, 26/06/2004, A. 1.

46. Tony Walter, *Body Worlds: Clinical Detachment and Anatomical Awe*, *Sociology of Health & Illness*, 26, 4 (2004): 28.

47. F. Robert Rodman, *Winnicott. Life and Work*, Cambridge, Mass., Perseus Publishing, 2003, p185.

48. Ibid., p153.

Winnicott's theory about prolonged birth memory - the relief that comes 'when the end is in sight from the beginning'⁴⁸ - as a springboard to think about Gunther von Hagen's real specimens. Why could these purified units, existing outside the distortions of the mind, only come into existence against the backdrop of medical and research genetics?

Just as cloning, protein sequencing, and gene product amplification are dependent on synthesizing vast quantities of molecular data into symbolic textual representations, magneto-encephalography and electromyographic scans visually record the massive flow of neuronal information within the nervous system. Unlike the illustrated anatomies of Vesalius or Albinus, however, bio-computers have gotten us deep inside the skinless human animal with the explosion of data on DNA, RNA, and protein sequences. But what we, in fact, see are simulations: bio-fictional ciphers generated and analysed through automated tools utilizing intensive computer calculations and elaborate search algorithms.

By contrast, in the early modern medical world, the human body was considered variable and mutable. Up to the eighteenth century, its humoral properties contributed to the belief that it was porous and always in flux. As a microcosm of the surrounding universe, it continuously interacted with that greater, God-given macrocosm to which it more or less-perfectly corresponded, depending on fluctuating conditions of health or sickness.⁴⁹ What gave the human body its specific open and fragile identity, then, was the ongoing need to establish an analogical bond linking its particular psychosomatic components with those of external nature - whose matter was also shot through with numinousness.⁵⁰ Thus from Vesalius to Vicq d'Azyr, cadavers were never lifeless but transformed (in myriad illustrated anatomy books) into energetically striding, standing, or sitting figures. Even when recumbent, they were never merely prone but actively being eviscerated or mined for bones, muscles, organs, and tissues that demonstrated the glory and nothingness of human material on an amphitheatrical stage, under the watchful eye of the public.

That drawn-out era in which you could learn about biology only by studying natural systems has finally drawn to a close. Eugene Thacker has argued that each of the new biotechnologies I mentioned earlier in this essay articulates a specific kind of body. These 'biomedia,' further, are predicated on the premise that computation *is* biology, or in other words that there is a fundamental equivalency between the biological and digital domains so that they can be rendered interchangeable in terms of materials and function.⁵¹ It is this rapidly becoming self-evident *fact* of the 'technical reconditioning of the biological' that, I believe, we clearly seen in Hagen's direct reworkings of gross anatomy. The throngs attending his display of 'Anatomy Art' can, if they so wish, experience in the exhibition, and in common, what is difficult or impossible for ordinary persons to see in the bio-molecular body, or in the adult stem cell body, or in the nuclear transfer cloned body. That is, the average, interested citizen can witness and think about the consequences of

49. See my *Body Criticism. Imaging the Unseen in Enlightenment Art and Medicine*, Cambridge, Mass. and London, MIT Press, 1991; 1994.

50. See my *Visual Analogy. Consciousness as the Art of Connecting*, Cambridge, Mass. and London, MIT Press, 1999; 2001.

51. Eugene Thacker, *Biomedica*, Minneapolis and London, University of Minnesota Press, 2004, p5.

instrumentalizing biology into designed contexts.

I have been arguing that self-eugenics is a form of transcendence.⁵² Wherever we look - but, especially, in the emergent 'synthetic' biological sciences - there is an obsession with beyondness. Nietzsche, in his *Twilight of the Idols*, extolled a rapturous life 'ascending'. Significantly, he imparted a distinctively contemporary twist to the feeling of self-enhancement - by which he meant not the whole Socratic-Christian 'improvement-morality' but an increase in instinctual force and plenitude.⁵³ Heidegger, in turn, glossed Nietzsche's sensual 'beatitude' to emphasise that this substantive increase in strength and power must be understood as the ethical capacity to extend beyond oneself.⁵⁴ If, for Nietzsche, the supreme affirmation of life entailed no desire for a super-natural elsewhere, this cannot be said to reflect our current situation. An excess of *physical* self-presence - whose overflow does not necessarily translate into a meaningful encounter with another human being - results from the ecstasy of biologically-based enhancement. It gives us the perfected self as unconditioned absolute.

52. See my 'Levelling the New Old Transcendence: Cognitive Coherence in the Era of Beyondness,' *New Literary History*, special issue on *Coherence*, 35, Spring (2004): 321-338.

53. *The Portable Nietzsche*, Selected and Translated by Walter Kaufmann, New York, Viking Press, 1954, pp478-479.

54. Richard K. Sherwin, 'Law's Beatitude: A Post-Nietzschean Account of Legitimacy,' *Cardozo Law Review*, 24 January (2003): 690.