Body rebuilding : tracing the body at the dawn of the cybernatic age

Body Rebuilding: Tracing the Body at the Dawn of the Cybernetic Age

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This essay traces figurations of the body in visual culture at the dawn of the *cybernetic age*. Through technological and organizational change from the mid-twentieth century onwards work has become increasingly dissociated from the body. In terms of work the body has, in fact, become progressively obsolete, and we have been witnessing, in the twentieth century, a fundamental realignment of body, work and self. Based on an understanding of visual culture as a key element of culture in the sense of a system of symbolization that provides a social semantics to contemporary societies, this essay proposes to read a number of figurations of the body in post-industrial societies as paradigmatic of what may be called the body's age of obsolescence. Particular attention is accorded to the obese body, the sculpted body of the body builder, and the composite body of the cyborg. The contribution proposes to read all three body types in the light of Georges Bataille's concept of "dépense" while highlighting the structural melancholia of the performance of the body builder and the problem of the technological self in the cyborg.

> The contemporary Western personality is itself preponderantly a visible self, its identity is embodied in external performance.
> Kenneth R. Dutton, *The Perfectible Body*

Work, understood in the broadest sense as *useful activity*, has been safely ensconced as one of the founding principles of modern democratic societies since the nineteenth century.[1] In antiquity, work was usually

[1] For a history of the concept of *Arbeit* (work) with a particular focus on Germany, see Conze.

The Visual Culture of Modernism. SPELL: Swiss Papers in English Language and Literature 26. Ed. Deborah L. Madsen and Mario Klarer. Tübingen: Narr, 2011. 61-83.

thought of as an onerous task best left to slaves and other providers of dependent labor. In the wake of the Protestant Reformation and an emergent bourgeois culture the idea of work underwent a progressive nobilitation. Much more than merely a useful activity, work became a matter of vocation and spiritual choice, a *Beruf*, to use Martin Luther's term, a profession. The emancipated individual that every citizen of a modern society ideally is, defines and expresses herself in important ways through her preferred useful activity. Work is now both a universal duty and a personal privilege, a potential source of pride and dignity. It is in fact only through the idea of dignity derived from professional success that the dynamics of modern capitalism can be properly understood, and it is only against the backdrop of a conception of individuality-as-expression through work that the modern critique of alienation and alienated work, as it was first proposed by Marx in his early writings of the 1840s, makes any sense (see Ollman).[2]

For most of its history and even after it entered the spiritual realm of the Protestant *profession*, work meant, first and foremost, bodily labor (Kocka, Offe, Redslob).[3] In industrialized societies until the mid-twentieth century most of the work performed involved an important degree of bodily activity, including in particular assembly-line work. The degree to which, despite all advances in machine technology, industrial production continued to evolve around the body-at-work well into the twentieth century can be gauged from the fact that new fields of scientific research focusing on the body-in-movement and the body-at-work evolved in the second half of the nineteenth century. Physiology, *Arbeitswissenschaft* and later ergonomics were, to varying extents, all preoccupied with studying and eventually improving the performance of the body as an element of the industrial production process, with fatigue and exhaustion and how to overcome them a primary concern (see Rabinbach). Significantly, the knowledge these disciplines produced evolved around the body as a privileged site of visibility: the site where the transformation of energy into performance could be studied in a field of vision.[4]

We have become accustomed to view such practices of positioning the body as an object of knowledge through the sophisticated lens of discourse analysis, and within the framework of Marxist theory most

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[2] This is the provocative argument proposed by Deirdre McCloskey in her most recent book *Bourgeois Dignity*.

[3] Of particular interest here are the contributions by Wilfried Nippel on labor in antiquity and by Richard von Dülmen on the concept of labor in early modernity.

[4] For an exploration of the analogy between factory floor and scientific laboratory spaces in scientific and management discourses after 1860, see Hoof, *The One Best Way*.

forms of industrial occupation continue to be seen as examples of alienated labor. Yet for all the discipline and control involved in industrial organization and for all the progressive *deskilling* of the worker in advanced industrial societies physical industrial labor more often than not proved to be a source of pride and dignity for industrial workers.[5] As late as 2010 a former steel worker (and a key figure in a non-unionized labor struggle) could wax nostalgically about his years of work at Krupp's legendary Rheinhausen steel plant near Duisburg, Germany, which closed in 1993, highlighting the aspect of physical excitement, now sadly lost, in the performance of an arduous and potentially very dangerous task.[6] This sense of excitement should not be easily discounted. Rather, it should be seen as containing an irreducible core. In a sense, while industrial production and the adjacent scientific discourses have evolved around the visible body as the site of work, modern industrialized societies have pivoted around a dynamic alignment of body, work and self. Once work became an expression of the self, the body emerged as both a potential vessel of expression of the self through work, of individuality linked to a particular profession and hence as a source of dignity, and as a potential site of alienation, a suppression of the self through a mode of work that did not allow for individual expression. These alternatives are not mutually exclusive. Rather, the body can oscillate between the two. The former Krupp employee's account of his professional experience (and one should understand both terms emphatically here) shows that one man's alienation may well be another man's specifically modern expression of the self through work, in this case: Through the bodily performance of arduous physical labor.

However, particularly in Western industrialized societies, the nature of work has changed dramatically over the last half century. Taking a cue from social historian Philip Sarasin one could frame this shift in Foucauldian terms and speak of a transition from a Thermodynamic age and order of knowledge, marked by a fixation on (physical) energy and the transformation of energy into performance, to a Cybernetic age marked by a focus on information and control (Sarasin). The range of useful activities labeled as work has come to include a wide variety of occupations, progressively marginalizing the role of bodily work as a

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[5] For a classical articulation of this position, see Braverman.

[6] "Helmut Laakmann . . . hat heute einen guten Job. . . , aber so wie früher wird es nicht mehr sein. Er vermisst die Hitze der Hochöfen, die sprühende Glut beim Anstrich. 'Das waren Monster, diese Öfen, die haben Funken gesprüht wie ein Drache'" ("Helmut Laakmann . . . has a good job today . . . but it will never be like before. He misses the heat of the blast furnaces, the blaze of the molten iron when they open the furnace. 'Those were monsters, those furnaces, they sputtered fire like a dragon.'" (Kämper 455, my translation).

result of technological and organizational innovation. In the process, industrial labor of the *alienated* kind has been replaced as the paradigm of work in Western societies by a variety of activities seemingly more amenable to the idea of self-expression and self-realization, to the point where social scientists no longer ponder the fate and travails of the *working class* but celebrate the rise of the *creative class*.[7] In terms of emblematic representations of work, the Promethean figure of the worker who unleashes a gushing flow of molten steel or operates a gigantic hydraulic hammer in the noisy, dark underworld of the factory space – a figure prominently featured in the iconography of both *capitalist* and *communist* industrialized societies and the reliable focal point of both corporate and union-produced films about the steel industry – has been supplanted by the figure of the controller/spectator who sits at a desk, watches a screen and operates a symbolic machine, that is a machine that runs on, and produces, symbols rather than material objects, i.e. the computer. Still at the level of cultural icons, the shift from the thermodynamic age to the cybernetic age is a shift from entrepreneurial figures such as August Thyssen, Alfried Krupp or Henry Ford to the likes of Bill Gates, Steve Jobs and Mark Zuckerberg.

Both at the level of the factual and at a level of representation then, or both in terms of structure and semantics, at some point in the mid-twentieth century work has become dissociated from the body. Work has become invisible, no longer measurable in terms of units of energy transformed into performance in a field of vision, while the body has become largely obsolete, at least in terms of work.[8] Given the long history of work as bodily work, and given the foundational role of the idea of work and particularly of work as an expression of the self in modern societies, this is a momentous development.

Accordingly, what happens to the body at this juncture, when the body ceases to be the visible vehicle of work is a relevant question. So what happens to the body as an object of knowledge in a field of vision, and what happens to the alignment of body, work and self? As a scholar

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[7] This of course refers to the title of a somewhat famous, albeit controversial book by geographer and economist Richard Florida. The *creative class* in the sense of Florida is a very broad term, meant to include all aspects of the service economy concerned with information goods along with the arts and all kinds of research and development in traditional industries, which amounts to between 30 percent and 40 percent of the economy in any given developed society. More narrow, yet still quite broad definitions of the *creative industries*, which include the arts, advertising, sports, and the IT sector, set the tally of *creative* activities in developed economies at around 20 percent of GDP (Florida). Similarly, and ever the gifted aggregator of advances in the social sciences, Jeremy Rifkin pronounced the "End of Work" as early as 1995 (Rifkin).

[8] On the relationship between work, innovation and visibility see Hediger.

of film and media I will obviously try to answer these questions by taking the semantics of the body as my point of departure. I will study visible bodies, or representations of bodies. However, I will not treat these representations as mere reflections of pre-existing realities. Semantics and structure cannot be neatly separated in this case. Generally speaking, if we consider culture to be a system of symbolization that, in a constant feedback loop, provides a semantics of structural change to contemporary societies, and if we consider visual culture to be a key element of culture in this sense, then figurations of the body are of particular significance as both *indicators* and *factors* in the shift. More specifically, and with regard to its role in the practices of industrial organization, the body is always already a visible object. In ergonomics, for instance, the body figures primarily as a visible object of study, an image-object in which image and knowledge are inseparably linked. The realignment of work, body and self which occurs at the dawn of the cybernetic age, then, is not just an event that will be reflected in cinematic, photographic and other types of representation. It is, to an important degree, an image-event: an event that occurs in and through images of the body at work, or no longer at work.

This essay, then, deals with the image-event of the body's obsolescence. Depending on the view point and the theory in play the obsolescence of the body can be seen either as liberating, as the juncture at which the body has finally been liberated from the toil of physical labor to become the vessel of self realization, or as a loss, as the disruption of the unity of body, work and self. In this essay I will explore the scenario of disruption, and I will assume that we are dealing with a moment of crisis in the history of the alignment of body, self and work. First, I will focus on the use of film in ergonomics in the work of Frank Bunker Gilbreth, a pioneer of the management consultancy business in the early twentieth century. Gilbreth used film cameras in an attempt to rationalize bodily movement. Paradoxically, but significantly, Gilbreth's efforts met with failure but led to the development of one of the basic tenets of robotics. My key point in this essay is that Gilbreth's work marks a key transitional moment towards the obsolescene of the body in what sociologist Daniel Bell, in an influential book first published in 1973, called the "post-industrial society" (Bell, *The Post-Industrial Society*). In my conclusion, and with an eye to further research, I will briefly address the fate of the obsolete body in a post-industrial environment through a series of body formations, all of which rose to cultural salience and became image-events in the mid-to-late 1970s: the obese and the anorexic body, the sculpted body of the body builder, and the body of the cy-

borg. What I am interested in here, then, is not so much the post-human body but the post-industrial body as an image-event.[9] Mostly for reasons of limited space the essay focuses mainly on the male body in developing its basic argument while leaving the framework of analysis open to more detailed evaluation of gender and gender differences. Let me start out, however, by explaining what I mean by "obsolescence."

I

Among the distinctive traits of modernity are surplus and the superfluous, and the history of modernity could well be written as a history of the discarded and the obsolete. If we define modernity, as sociologists like Anthony Giddens suggest, by and large as industrial civilization, then modernity can be seen as a process of ceaseless innovation whereby all kinds of things are constantly rendered obsolete, or recognized as obsolete: material objects, social roles, systems of knowledge and belief, even living organisms.

In the cultural semantics of obsolescence, living organisms occupy a privileged position. Modernity could in fact be described as the age in which man finally came to understand, through the insights of Georges Cuvier and Charles Darwin, that life is neither an eternal cycle nor a timeless essence, but a historical process in which life forms succeed each other and can and do become obsolete, which happens every time an animal species becomes extinct. As recently as the eighteenth century the very idea of extinction was incomprehensible even to the most educated of natural philosophers. Thomas Jefferson, for instance, was convinced that the mammoth, which in his *Notes on the State of Virginia* he calls "big buffalo" and the "American incognitum," was not an extinct species but alive and well somewhere in the as-yet unexplored outer reaches of the American northwest (Barrow 19). When 75 years later Darwin published *The Origin of Species* – which is, of course, not about the origin of species but about the fact that, strictly speaking, there are no species but only evolving life forms – the book summed up a latent consensus and furnished a cogent theory that explained, among other things, a fact of life, or a fact about life, that had been quite firmly established since the early nineteenth century. In the wake of the French Revolution, French zoologist Georges Cuvier (1769-1832) conducted a study of animal fossils that led him to conclude that animal species have a history and do become extinct (Outram). Cuvier summed up his results in a book entitled *Recherches sur les ossements fossiles ou l'on rétablit les*

[9] For the notion of the post-human body see Halberstam and Livingston; Hayles.

caractères de plusieurs animaux dont les révolutions du globe ont détruit les espèces in 1812. But as early as 1798, Cuvier stated in a paper delivered to an audience of colleagues, "There is no longer anyone who does not know that the world we inhabit shows everywhere clear traces of large and violent revolutions" (Cuvier 35). While the destruction of entire animal species quickly became an accepted fact in the scientific community of the early nineteenth century, the display of animal fossils in the newly established natural history museums made the possibility of extinction an element of common knowledge by the mid-nineteenth century (Sheets-Pyenson; Bennett 19ff).[10] Ideas of evolution had circulated in visual representations since the 1830s, and visual displays such as the dinosaur exhibit at the London Crystal Palace world fair park, which opened in 1853, testify to the fact that the obsolescence of animal species was firmly established in the public mind even before Darwin published his *Origin of Species* in 1895 (Goodall). The impact of Darwin's theory both on the further development of the discipline of biology and on culture at large is well known, and the cultural consequences of the theory of evolution continue to be deplored in some quarters to this day, particularly by religious fundamentalists in the USA and in some Islamic countries such as Turkey. In Austria, Darwin found an attentive reader not only in Sigmund Freud, who listed the theory of evolution amongst the three major historic *Kränkungen* of the narcissism of man, but also in Joseph Schumpeter, an economist, short-term minister of economic affairs of the nascent Austrian republic in 1919/1920 and later a Harvard professor. Schumpeter's life work was the study of the dynamics of capitalism, which he approached by integrating sociology, history and philosophy with economic theory. In his *History of Economic Analysis*, published posthumously in 1954, Schumpeter denies any direct influence of Darwin's theory on the economic thought of his time. Rather, he argues that Darwin and Marx were swimming in the *same river*: "Marx may have experienced satisfaction at the emergence of Darwinist evolutionism. But his own had nothing whatever to do with it, and neither lends any support to the other" (Schumpeter, *History of Economic Analysis* 420). But while Schumpeter's own understanding of Darwin has been the bone of contention among historians of economic theory (Hodgson), Schumpeter characterizes the dynamics of capitalism as an evolutionary process both in his early work, *Theorie der wirtschaftlichen Entwicklung* from 1911, and in his most widely read book *Capitalism, Socialism and Democracy* from 1942 (see in particular 82-85). In an influential critique of the static market models and the equilibrium theories of neo-classical economic

[10] On the natural history museum as a source for the study of animal extinction see Shaffer, Fischer and Davidson 27-30.

theory Schumpeter famously argued that markets are never stable and described the dynamics of capitalism as a process of "creative destruction." Markets and with them economic development, Schumpeter argued, are not driven by a tendency towards equilibrium, but by innovation and the sudden irruption of new products and players which replace and render obsolete, rather than improve upon, previous products. Thus even the most technologically advanced horse carriages quickly became obsolete at the turn of the twentieth century with the appearance of the automobile – except of course, and perhaps ironically, given that it is the city where Schumpeter mostly grew up and attended university, in Vienna where horse carriages continue to contribute to the economy in important ways.[11] If the idea of extinction is at the heart of the biological theory of evolution, the idea of creative destruction provides the key to the dynamics of a capitalism understood as an evolutionary process. Both evolve around obsolescence, of living organisms and material objects, but also of systems of knowledge. Against this backdrop, in terms of the field of vision, the trash heap – that ubiquitous repository of the obsolete – is one of the signature sites of modernity.

But if the obsolescence of beings and things is a distinctive trait of modernity so is surplus, the overabundance of objects and knowledge or that which is superfluous. Luxury, of course, is not a modern invention, but the availability of objects and knowledge far in excess of what is strictly necessary (or knowable) counts among the most obvious features of modern industrialized societies. Hegel, in his *Grundlinien der Philosophie des Rechts*, was probably the first modern thinker to analyze the dynamics of an economy that produced not only in excess of what was needed, but in the process managed to mold and create needs and desires in excess of what was strictly necessary in terms of subsistence (Hegel 246 ff). Similarly, Durkheim based his analysis of social relations in his 1893 dissertation *The Division of Labor in Society* on the assumption that man's social and emotional needs are unlimited, while his physical needs are determined by the body and its functions. Very much along the same lines, for Schumpeter it is

> the producer who as a rule initiates economic change, and consumers are educated by him if necessary; they are, as it were, taught to want new things,

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[11] In an often-cited passage in his *Theorie der wirtschaftlichen Entwicklung* Schumpeter lists five types of innovation: the introduction of a new good, the introduction of a new method of production, the opening of a new market, the conquest of a new source of supply of raw materials or half-manufactured goods, and the carrying out of the new organization of any industry (see Schumpeter, *The Theory of Economic Development* 66). The example of the horse carriage is Schumpeter's own.

> or things which differ in some respect or other from those which they have been in the habit of using.
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> (Schumpeter, *The Theory of Economic Development* 65)

Nobody needs a BMW limousine with 520 hp, particularly not in a country like Switzerland where speed limits are 120 km/h but BMW sells them by the hundreds, if not thousands, in Switzerland alone. With his theory of the commodity fetish Marx attempted to provide an explanation of how this process works: how the superfluous comes to be seen as necessary through the attribution of quasi-magical qualities to products that, in the process, enter and evolve in a realm far beyond mere functionality. But whether it is the commodity fetish or the genius and the ruse of the entrepreneur (as in Schumpeter's view of the process) in industrial civilization material objects constantly address us with a call of "you need me" not only, to paraphrase an old Ella Fitzgerald song, "more than you know," but "more than you need me."

The production of surplus might be considered purely a waste of resources, of time and energy. As such, it appears to run counter to one of the guiding principles of modern economic development, namely rationalization. Rationalization can be defined as the increase of output relative to the same input (in terms of raw materials, technology and labor), or the increase of output in combination with a decrease of input. Innovation, the driving force of capitalism according to Schumpeter, consists – among other things – in the development of new products, but also in the rationalization of existing production processes. Rationalization cuts back on waste and unnecessary surplus. It is, if you will, the process of proactively determining which elements of the production process are superfluous and can be eliminated. Rationalization is proactive creative destruction within the firm as opposed to a process that happens between firms through the play of market forces. Yet at the same time the streamlining of production leads to even more surplus on the side of output. Based on an example from agriculture, David Ricardo famously stipulated in the early nineteenth century that an increase in the volume of production leads to a decrease in returns. As the rapid development of consumer product industries in the second half of the nineteenth century and the early twentieth century showed, Ricardo's "law of diminishing returns" applied only to a very limited set of circumstances. The more likely standard case of capitalist economic development turned out to be increasing returns on an increase of volume of production driven by malleable consumer demand (Schumpeter, *Essays on Entrepreneurs*) – particularly in the early and mid-twentieth century, when Western societies reaped the benefits of a number of technological and other innovations of the late nineteenth and early twentieth

centuries such as the telephone, the automobile, and advances in education, that led to a rapid proliferation of mass-produced goods and services and a steep rise in living standards throughout the industrialized world.[12]

In the twentieth century the paradox of growth, of increasing efficiency and growing waste, posed not least a cultural challenge and prompted, among other things, a philosophical rethinking of some of the basic notions of political economy. Beyond the realms of economics per se, French philosopher Georges Bataille, who was a keen reader of Hegel and Nietzsche and no less a polymath and grand theorist than Schumpeter, addressed the dynamics of growth and waste in terms of *dépense*, dissipation, and accumulation. In his book *La part maudite* (1943-1946), published in English as *The Accursed Share*, Bataille turns classical political economy on its head and develops an economy of surplus and excess rather than an economy based on notions of scarcity. Dissipation, Bataille argues, is built into human societies generally: The dispersion of surplus energy is a marker of the ebullience of life itself. The potlatch, as studied by anthropologist Marcel Mauss, would be an example: a ritual of giving gifts where one tribe shames another into responding to a gift with an even bigger gift until both tribes are essentially ruined. Modern economies, Bataille argues, also evolve around the "part maudite," the "accursed share," that part of the accumulated wealth that is not reintroduced in the cycle of production and accumulation but rather spent in apparently senseless and uneconomical ways, i.e. wasted or dissipated. The "accursed share" can take the form of ostentatious luxury, of non-procreative sexuality, but also, and most importantly, the form of war, which Bataille, writing under the impression of two consecutive world wars, views as a quasi-ritualistic collective annihilation of surplus energy. The trick of bourgeois capitalism, according to Bataille, is that it manages to combine, and sometimes even balance, dissipation and accumulation. By mutually recognizing each other's acts of dissipation and imitating or exceeding them, actors in a bourgeois capitalist system set off a process of accumulation. The *telos* of accumulation is dissipation, but dissipation sets off further accumulation. It is a cultural logic that much like Schumpeter's creative destruction is both nefarious and extremely productive, but while for Schumpeter excess, waste and obsolescence are external effects of the dynamics of capitalism, Bataille suggests that dissipation is something like the immanent *telos* around which the process evolves.

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[12] Tyler Cowen characterizes these innovations as "low-hanging fruit": i.e. innovations which could be easily exploited for rapid economic growth.

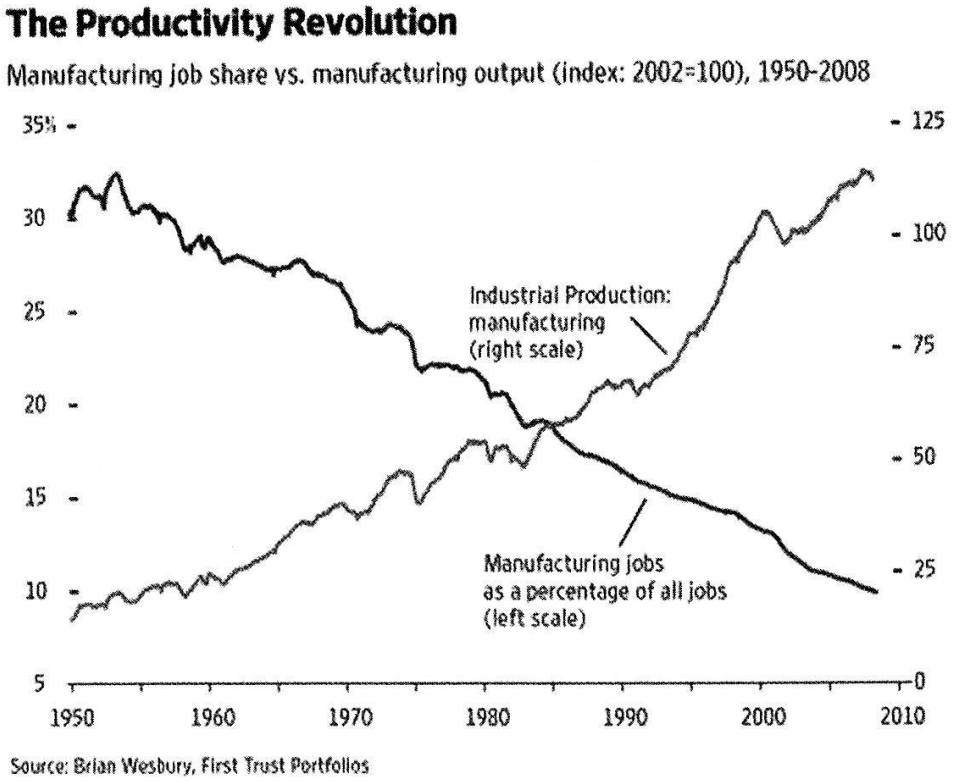
Where Bataille adopts a framework of philosophy and anthropology to search for the hidden meaning of the apparently senseless dissipation and distribution of surplus in culture in a broad sense, Schumpeter highlights the dynamics of creative destruction in modern capitalism. Both, however, in their own ways underscore the fact that surplus and the superfluous and the obsolescence of the discarded, are no mere accidents. Obsolescence is, in fact, part and parcel of the economic and social dynamics of modern industrialized societies, or of modernity, for that matter. While he does not address the issue in terms of a Schumpeterian analysis of capitalism nor through Bataille's economy of excess, W.J.T. Mitchell is certainly on to something when he calls the dinosaur, the obsolete animal *par excellence*, the "totem animal of modernity." Just as the extermination of large animal species in particular has been understood as a collateral effect of the rapid expansion of capitalism over the last three hundred years, our knowledge and understanding of life as a historical process and of extinction as an ineluctable outcome of the process of evolution is roughly coeval with a substantial understanding of the dynamics of capitalism.[13] The dinosaur, if you will, swims in the same *river* that Schumpeter refers to, the river that includes both Marx and Darwin: Not *lethe*, the river of forgetting in Antiquity, but the modern river of obsolescence.

II

With this framework in mind let me now return to the question of the body's obsolescence, or rather to the obsolescence of the body as an image-event. As I argued in the introduction, at a particular juncture roughly in the middle of the twentieth century, the body becomes largely obsolete in terms of its role in industrial production processes. At this juncture, at the dawn of what we might call the *cybernetic age*, i.e. the moment roughly in the middle of the twentieth century when information technology becomes a fact of life, a realignment of body, work and self occurs. What happens at this juncture in terms of the composition and the character of work in industrial production can best

[13] For a zoogeography of the extinction of large animal species in the last three hundred years see Planhol. For the sake of anecdote it should be noted that the conservation of animal species has become a subject of economics as well. The field of mathematical bioeconomics is concerned with the economics of maintaining animal populations. The models developed in this field help, among other things, to understand why, under certain biological and economic conditions of the commercial exploitation of animals, extermination of the entire population may appear as the most attractive policy, even to an individual resource owner (Clark, *Profit Maximization*).

be described, or rather shown, in the following graph with two curves that combine to form a chiastic pattern.



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The falling line indicates the percentage of the work force employed in classical manufacturing jobs in the period from 1950 through 2008; the ascending line indicates the rate of productivity and the industrial output per worker employed in the same time period. What the graph shows, then, is that in the last sixty years productivity has increased by a factor of five, while the percentage of people employed in manufacturing jobs in Western industrialized societies dropped from 33 percent to below 10 percent of the workforce. As Robert Solow showed already in the late 1950s, the explanation for this lies in technological innovation, from the 1960s onwards particularly through the introduction of information technology and robotics into the manufacturing process, and new forms of industrial organization, particularly strategies such as lean production and flexible specialization.[14] What the graph also shows, albeit by implication, is that about two thirds of the manufacturing jobs have migrated

[14] Robert Solow's main contribution to economics was to relate growth to technological innovation in two highly influential papers that earned him the Nobel Prize in Economics in 1987 (see *Theory of Economic Growth; Technical Change*).

to other industries or, to use the terminology coined by Australian economist Colin Clark in his 1940 book *Conditions of Economic Progress,* from the secondary to the tertiary sector of the economy.[15] Alternatively, if you prefer Daniel Bell's more supple taxonomy, to the tertiary (transportation and utilities), the quarternary (trade and finances) and the quinary (health, education, arts, etc.) sectors (*Post-Industrial Society* 121-163). What we see, then, is a striking graphic representation of the principle that economic progress can be "defined as a function of the differential productivity among the sectors" (*Post-Industrial Society* xiv). More specifically, what we see is the advent of what Daniel Bell called "the post-industrial society." Coincidentally, the two lines intersect exactly at a point in the mid-1970s, at the time of publication of Bell's book, a point to which we will return shortly.

One could argue that the graph shows the effects of a transition from what may be called the thermodynamic age of industrial civilization to the cybernetic age. In the thermodynamic age industrial organization is concerned with coordinating human bodies with machines in an ordered, rational and productive fashion. In the cybernetic age the focus is on information and control, on the substitution of human operators with machines that can perform the same tasks more cheaply and more reliably, and in the coordination of large systems. At the dawn of the cybernetic age physical labor of the kind typically involved in manufacturing jobs has become considerably less relevant to the economy as a whole, even in classical manufacturing industries such as the automotive and steel industries, where workers now primarily operate robots and other substitutes for manual labor rather than perform the task themselves. At this juncture, bodies become obsolete because, thanks to the effects of rationalization, fewer workers are needed to perform the same tasks and produce the same output, or because new machines replace manual and bodily labor altogether, as in the automotive industry, where robots now perform almost all the work that used to be done by workers, and bodies can become obsolete because new types of production do not require any kind of physical labor and physical presence at all: often, the body is merely a vessel for a capacity to operate symbolic machines. Most importantly, however, at the juncture that the graph describes the body ceases to be the locus where the transformation of energy into performance could be studied in a field of vision.

This shift is perhaps best illustrated by the work of Frank Bunker Gilbreth, a notable figure in the field of time and motion study and one of the pioneers of the management consultancy business in the 1920s.

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[15] Colin Clark who pioneered the use of the term "Gross National Product" is not related to Colin W. Clark, the mathematical bioeconomist.

Gilbreth's work predates cybernetics and the passage to a post-industrial order by almost half a century. Yet his work-study films presage, and partly help bring about, what is to come. A former entrepreneur in the construction business Gilbreth latched on to Frederick Taylor's theories of scientific management to devise a method of improving the performance of bricklayers on construction sites (Gilbreth, *Bricklaying System*). He quickly expanded his field of study to include all kinds of industrial labor and even medical surgery (Gilbreth, *Motion Study; Primer of Scientific Management; Motion Study in Surgery; Applied Motion Study*). Supported by his wife Lillian, with whom he had twelve children and lived in a household organized according to the principles of scientific management (Gilbreth and Gilbreth Carey), Gilbreth developed a method of using film cameras to record and analyze the movements of workers, and to create visual displays of optimized work procedures (Curtis). After early attempts at filming on factory floors produced disappointing results, Gilbreth devised a proper film studio with prepared backgrounds and timing devices which allowed him to perform detailed measurements both in terms of the spatial and the temporal aspects of the worker's performance (Novak). Gilbreth quickly became famous, not least because of the striking visuals, both film stills and the films themselves, that accompanied his publications and lectures. Partly because two of Gilbreth's children, Frank Jr. and Ernestine, wrote a book about their childhood in the Gilbreth household which became hugely popular with US postwar suburban families and was turned into a successful Hollywood film in 1950 with Clifton Webb and Myrna Loy in the leading roles, Gilbreth continued to be viewed as the leading pioneer of time and motion study long after his initial publicity successes.[16] In a similar vein, but with a negative slant, in contemporary critical literature Gilbreth is often associated with repressive disciplinary regimes in capitalist industrial production of the 1920s (see Reichert). As a recent study by Florian Hoof shows, however, the story of Frank Gilbreth as a management consultant is largely a story of failure. In his doctoral research on Gilbreth, Hoof shows that Gilbreth's methods were very popular with mid-level to senior management but failed to impress and catch on with the workers who were supposed to benefit from his methods. Where Taylor's methods of scientific management aimed at eliminating what he perceived to be the innate laziness of industrial workers, Gilbreth's work was not motivated primarily by moral concerns. Rather he wanted to improve both the performance and the working conditions of industrial workers (Sarasin). Nonetheless, his efforts remained largely

[16] For a study of the Gilbreth family in popular culture in the United States in the 1950s see Levey.

fruitless. Workers resisted the implementation of his techniques, even after he had established a *star system* of sorts in which he personalized the performers in his films in order to allow factory floor personnel to relate to their models in an individual way. In a pattern that was to become commonplace in the consultancy business, however, lack of tangible results did not directly translate into a drop in demand for Gilbreth's services (Hoof, *Film – Labor – Flow-Charting*).

After Frank's untimely death in 1924, Lillian Gilbreth, who held a PhD in organizational psychology, as opposed to her husband who only had a high-school diploma, continued their business and expanded into the services sector, re-organizing, among other things, the customer services at Macy's, a major New York department store (Graham). As for Gilbreth's time and motion studies, perhaps paradoxically the one area where he did leave an important mark in the long term was robotics. The key problem Gilbreth tried to solve was the problem of the transfer of implicit knowledge. Work place routines as performed by experienced workers imply a type of knowledge that philosopher Michael Polanyi calls "personal knowledge" or "implicit knowledge." It is a knowledge attained through experience, but it is different from other types of knowledge in that it is not propositional in nature and hence cannot be transferred to another subject. Gilbreth's entire system of time and motion study constituted an attempt to codify the implicit knowledge of the worker and make it transferable. Through this ambition alone Gilbreth is already representative of an order of industrial production that prepares the ground for the shift to post-industrialism, since the codification of knowledge and the dependence of industrial innovation on scientific research are usually seen as key elements of the development of capitalism in the twentieth century (Bell, *Post-Industrial Society* xxxix.). It would be interesting to speculate about the philosophical reasons for Gilbreth's failure to fully transfer implicit knowledge from one body to another, and it is interesting to note that similar ideas are still being pursued in organization research almost a century after Gilbreth's first experiments.[17] However, to the point that he did succeed his success was not an intended outcome. Gilbreth broke down human movement into a basic set of 17 easily identifiable and repeatable components such as "search," "find," "select," "grasp," "assemble," "use," "disassemble,"

[17] Thus in a recent publication three Japanese engineers argue that knowledge acquired by experience can be transferred in the form of automatically generated manuals: "To automate the documentation, we have developed a method of observing a worker's motion with IC accelerometers and we have built a program that automatically generates a manual from the recorded work process" (Hori, Hirose, Taki). This is a concise summary of Gilbreth's project, with computer technology taking the place of film.

etc. He then codified these movements with a series of hieroglyph-like ideograms. While factory workers by and large failed to adopt this system, Gilbreth's table of the basic components of human movement serves as the basis for robotics to this day. To an important degree, then, Gilbreth's efforts at improving the bodily performance of the worker eventually made the presence and performance of the human body on the factory floor obsolete. The bodies that we see in Gilbreth's films are already specters of themselves. Precisely in the moment of its most acute visibility the worker's body is about to be replaced by a technological substitute, and work as bodily performance disappears. Gilbreth's films resemble salvage ethnology films and films of rare and threatened animal species in that they capture a *last chance to see* moment: they capture the worker's body at the threshold of obsolescence, and like much of salvage ethnography, they hasten their object's demise. Given their subsequent use Gilbreth's films are both a record of the body and the medium that, in a momentous image event, puts the body literally out of work.

III

I began this essay by asserting that one of the distinguishing features of modernity is an alignment of body, work and self in which the self finds expression in work and the body, through physical labor, becomes a source of pride and dignity. I further argued that the modern alignment of body, work and self evolves around the visible body and the visibility of the process whereby energy translates into performance. I then proceeded to argue that the transition from the thermodynamic to the cybernetic age, i.e. from an order of production evolving around the visible transformation of energy into performance to one evolving around information and control and of "work as thought" rather than work as bodily performance, involves a re-alignment of body, work and self which amounts to a crucial episode of creative destruction in that it affects, and alters, one of the basic tenets of industrial modernity: to the extent that work continues to be an expression of the self the body no longer figures as an essential conduit in the relation of self to work. Work ceases to be an essentially visible process, and the body as the visible medium of work and the medium of the visibility of work becomes obsolete. I have argued that the work-study film captures this transition, the image-event of the working body's utmost visibility which marks, at the same time, the tipping point towards the obsolescence of the physical labor in a world of robotics.

So what happens next? Where does the obsolete body go, since it so obviously does not and cannot cease to physically exist? What shape or shapes does the surplus body take, and how does it figure in the emergent new relation of work and self?

One possible answer starts with the observation that in the mid-1970s, at the dawn of the post-industrial condition, the field of the visual begins to be populated by what we might call *bodies in crisis*: spent bodies, excessive bodies, bodies that speak of indulgence and waste but also of a self-discipline that is as excessive as it is ultimately useless and hence can only be plausibly interpreted as a form of enjoyment. In particular the series of bodies in crisis that gain cultural salience in the 1970s includes the obese and the anorexic bodies and the sculpted body of the body builder. As I would like to argue, in a brief concluding sketch, that the appearance of the body in crisis in the visual field marks the point where the obsolete body becomes part of the "part maudite," the accursed share: both the over-indulgence of the obese body and the excessive self-discipline of the anorectic and the body builder are forms of "dépense," of the enjoyment – however perverse – of surplus.

Both obesity and anorexia have variously been treated as "epidemics" since the 1970s, with obesity becoming a major public health issue and the Body Mass Index (BMI) a key parameter for the measurement of the relative health of a population (Caballero; Lupton 59-60 and 121 passim), while anorexia has been treated as a social issue rather than a public health issue (see Williams and King; Lucas; Brumberg). In terms of the image-event, the obese body marks a shift from the body as a source of dignity to the body as a source of shame. Shame is as much a socially efficient affect as pride, and if pride and dignity are key drivers of bourgeois capitalism, then the same can certainly be argued for shame and post-industrial capitalism.[18] In the classical industrial era, the body at work – as depicted, for instance, in the famous mural paintings by Diego Rivera in Detroit (Downs) – was an expression of force, self-restraint and discipline, and a source of the worker's pride. Once in itself a sign of wealth and hence a source of pride, the post-industrial obese body is a body out of work, a visible expression of self-indulgence, lack of discipline and hence – within the continuing logic of bourgeois pride – a source of shame. Yet at the same time the obese body is also a figure of enjoyment. This double aspect points to one of

[18] This is an argument that needs further elaboration along the lines proposed by Deirdre McCloskey in her work on bourgeois dignity. Recently, shame has been a topic of philosophy in the work of Bernard Williams who introduced the problem of shame and necessity into moral philosophy, and in queer theory (see Williams). For an analysis of the dynamics of shame and pride in market situations see Kaneff.

the core contradictions of capitalism. Based not only on discipline and self-restraint, but on the fostering of artificial needs and on supplying them, the success of capitalism depends on the emergence of a culture of self-indulgence that, according to some critics like Daniel Bell, who made this point in his 1976 book *The Cultural Contradictions of Capitalism,* will eventually subvert the discipline of self-restraint and destroy the system. However, more than thirty years after Bell's analysis we are still waiting for capitalism to collapse under the weight of our collective self-indulgence, which suggests that self-restraint and self-indulgence create a balance, however precarious, that tends towards stability. Within this balance the spectacle of obesity suggests that the body has indeed become a conduit of "dépense" rather than productivity, while productivity now relies on other resources. Along similar lines one could argue that anorexia is both a serious illness and a highly visible, spectacular and existential performance of the body's obsolescence, a *dépense* not in the form of an excess of gluttony, but an excess of asceticism.

If the shameful spectacle of obesity seems to suggest in an underhanded way that redemption for the body in crisis no longer lies in work, but in the work-out, the sculpted body of the body builder makes the same point more directly. The body builder's body is an *aesthetic body* in the sense that the strength and power it projects are surplus to requirement. As Adorno writes of the aesthetic object, "only what is useless can stand in for the stunted use value."[19] The product of countless workouts, the body builder's body is as much a body out of work as the obese body, and the self-discipline required to build it as much an excess and a "dépense," an enjoyment, as the self-indulgence of the overeater.

It is quite commonplace to treat the body builder's body in terms of narcissism. Taking work out of the equation (or reducing it to the work-out) body building links body and self in a narcissistic bond. However, staying within a loosely psychoanalytic framework, I would argue that the body builder's spectacle of the almost obscenely useless body is less a case of narcissism than a case of melancholia.[20] Where the obese body and the anorexic body may be seen as linear examples of *dépense*, that is

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[19] In his *Aesthetic Theory*: "only what is useless can stand in for the stunted use value. Artworks are plenipotentiaries of things that are no longer distorted by exchange, profit, and the false needs of a degraded humanity" (Adorno 298).

[20] It is important to note that in Freudian psychoanalysis narcissism and melancholia are intricately linked. Freud made the decisive step towards an understanding of melancholy in his study of narcissism in the 1910s. As Sandór Radó writes about the connection between narcissism and melancholia in 1928: "in melancholia the object which has been renounced is set up again within the ego and . . . thus in his self-reproaches the patient is continuing his aggressive tendencies against that object" (cf. Rado).

as embodiments of the accursed share – albeit *ex negativo* in the case of the anorexic body – body building may be understood as the re-building of the obsolete body, a melancholy performance in the sense that it is in itself an ultimately useless and unproductive exercise, a failure to mourn the loss of the body that leads to an exuberant excess of bodily performance. Very much in that sense most of the films featuring Sylvester Stallone, and particularly the *Rocky* and *Rambo* films, may be read as narratives of re-entry: they are fantasies in which the discarded body becomes useful again and re-enters the social order at a higher level of dignity, whether Rocky wins the Cold War in the boxing ring or John Rambo single-handedly resolves the conundrums of American post-war foreign policy in Vietnam and Afghanistan.

Yet not all sculpted bodies in the visual culture of the last thirty years are trapped in a melancholy performance of rebuilding – in the sense of redisplaying and redeploying – the body's erstwhile thermodynamic prowess. One of the key scenes in *The Terminator* (USA 1984, James Cameron) shows Arnold Schwarzenegger as the Terminator operating on himself after a violent encounter, trying to piece the human flesh and the mechanical parts underneath back together.[21] Similarly the film's poster shows Schwarzenegger with half his face missing and a gleaming red electronic eye fixing the viewer. One can argue that these images provide a synthesis of what the work-study films of Gilbreth both show and do not show: the image of the decomposing cyborg reveals the robot lurking beneath the frame of the body. Obviously, the realignment of body, work and self in the post-industrial condition affects not just the body but also the self. While Stallone's surplus sculpted body haplessly struggles to regain his erstwhile standing, the cyborg's composite frame points to the real problem: the problem of the technological self. For in the post-industrial realignment of body, work and self, technology renders the body obsolete but also takes the place of the self. What we see when we see the Terminator operating on himself is that it is from this self that body rebuilding must begin.

[21] On the philosophical implications of the cyborg operating on himself see also Sobchack.

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