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Abstract:

This article analyses Jacques de Vaucanson's automatic duck and its successive appearances in Thomas Pynchon's work (both *Mason & Dixon* and, by extension, *Gravity's Rainbow*) to discuss the correlations between (self-) evolving technologies and space age gadgets. The Cold War serves, therefore, as the frame of reference for this article, which is further preoccupied with the geographical positions that automatons or prototype cyborgs occupy: the last part of the essay analyses Walter Benjamin's *Arcades Project*, where mechanical hens stand at the entrance to dreamworlds. Automatic fowl guard, and usher into being, new technologised worlds.

The Ballistic Flight of an Automatic Duck

Fabienne Collignon

Figure 1: Duck, prototype Space Age technology.

In the illustration (Figure 1) that accompanies the 1742 translated publication of *Account on the Mechanism of an Automaton*, Jacques de Vaucanson's automatic duck occupies the centre; it similarly sits at the heart of this argument, where it is flanked not by musicians but by ghosts, the phantoms of machines that streak through Thomas Pynchon's work. Throughout its reasoning, this essay is aware of the forces

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and hauntings of technology; it emerges out of a concern with these disturbances (the links between technology and the occult) which are not always explicitly addressed. Instead, such phenomena arise through an experimentation with the form of the essay—associative, alert to secret affinities—that further refers to Pynchon's prose, which exemplifies these aspects in its proliferative connections. It is, above all, a piece that understands the development of technique as invariably carrying with it the spectres of earlier manifestations and, thereby, also those to come. The analysis of technology functions as an interpretation of dreams that has to be expressed in an idiom that corresponds to its subject matter: labyrinthine, fantastical, dynamic, full of ramifications and echoes.

The basic premises of this essay consist of three interrelated concepts—amalgamation, incorporation and transformation, a holy trinity of technological sublimity that links to the duck in the following ways: it is no longer set apart as a distinct historical entity; it features as one constituent in a sequence of progress that is both mythical and lethal; it is a device that haunts or stays in close proximity to future forms and future matter. Shit, in a way, is transmuted to gold, or rather glass, a material that shares its antithetical properties—intangible yet obdurate, existing on the borderland between states—with its "tutelary," a description Walter Benjamin uses in *The Arcades Project*; here, passageways are guarded by mechanical fowl.

The semantic differences between amalgamation and incorporation should, this time, be retained, even though both processes are treated in the same subsection titled "Pre-Launch:" a simple merger loses the reference to the corpus, which is to be inserted into the core of Cold War technology. The body in question, the duck, anticipates the rocket-boys to come, but amalgamation occurs between the different manifestations of the text of the duck, Vaucanson's and Pynchon's, in conjunction with Benjamin's mechanisms of the threshold. What this means is that the device flickers in and out of its manifestation as a solid object; consequently, the history of its image and of its successive upgrades —simulacra, automaton, cyborg—becomes a little hazy, although that state of being might just permanently define, or keep indefinite, such creatures. Prototype cyborgs, in whatever form, are black boxes, "ultimate fiction[s] to simplify complex systems;" they are also explosive propositions, associated with great ruin.[1] Warren Steele analyses the cyborg in precisely those terms, as a black box which "*cannot* and should *not* be opened [...]. To do so is to invite disaster" because once sealed, its contents can no longer be retrieved without eruption;[2] an equally pertinent observation relates to the model of thought that black boxes propose, namely that of containment culture.

To disclose the man-machine's internal make-up, Steele moves "backward in time, to a point before closure," to the beginnings of the cyborg's "spectacular production" instigated by way of the "dangerous combination of world-ending politics and eye-melting mega-death" that is the Cold War.[3] This article similarly keeps to this movement

of reversal, of great interest already in Pynchon's *Gravity's Rainbow* (1973), and studies its application to the black box of the automatic duck; this time, though, the volte-face is not a means of resistance directed against an overwhelming ideological as well as technological force but a manoeuvre that consolidates that same force. As such, any differences between the duck and its future expressions turn out to be irrelevant, because it so clearly is inserted into a narrative—of starting points and definite end-times—that considers it to be an antecedent to successive cyborgic designs: it is the history of violence deriving from device and force, that is the Cold War, which this piece seeks to trace. At any rate, the common ground that the duck shares with its progeny is, as mentioned earlier, the desire to enclose the world in, and as, a machine, a pattern that shapes the logic of both the Enlightenment and the Cold War. Paul N. Edwards, in his book on the function of computers in Cold War America, argues that "[a]s metaphors, such systems [the control and communications capacities of information machines] constituted a dome of global technological oversight, a *closed world*," whose "key theme [...] was global surveillance and control through high technology military power."[4] Vaucanson's duck, along with the inventor's other contributions to the emergent capitalist order, serves as one unit in a sequence of gadgets that all lead up to Cold War technologies of containment culture: the Cold War serves as a frame of reference for this article.

While the duck occupies the centre of a discourse of power swelling to superpower surpassing the planetary,[5] it nonetheless remains a border mechanism (this position articulates its irresolvable paradox, a point of eternal return); it is aligned with Walter Benjamin's mechanical hens that stand at the entrances to the arcades' glass *reich*. These interstitial areas, patrolled by their mirror images—automata that similarly breach states of being—indicate the potential of transformation happening inside glass architecture: arcades are spaces that operate according to a "dream logic"[6] of conversions, upgrades to more accomplished specimen. Glass culture forms another link in the process that evolves from duck to cyborg, whose glass-like coagulation develops in the aftermath of the Trinity detonation: "just as burning sand produces plates of shattered glass" in the New Mexican desert in July 1945, "the act of and/or potential for, a large atomic explosion also provides the necessary conditions for the production of the man-machine's mirrored body."[7] The glass *reich* of the arcades foreshadows the death cult and "great glass sphere"[8] of the atom bomb: the material hardens a reference to (anti-) utopia, and, by extension, to the transcendent/world-ending possibilities of phantasmagoric technologies. Both glass and duck indicate their ability to radically remake the world; they announce the triumph of technology, whose spectacular development really only ever arrives at the nuclear weapon. "Pre-Launch" establishes the Cold War context to the duck; "Glass Reich" charts the upshot of Trinity.

Pre-Launch

First exhibited in Paris in 1738, Vaucanson's duck traverses Thomas Pynchon's *Mason & Dixon* (1997), but it is also with respect to *Gravity's Rainbow* that its corpus, because of the device's evolutions, matters. In his article on the creature, Hanjo Berressem notes that,

> [the duck] has crossed the threshold from inanimate to animate, from passivity to activity, from machinespace to biospace, from "artificial life" in the 18th Century sense of the term to "artificial life" in its contemporary technological sense.[9]

Berressem analyses the duck's evolution from plaything to autopoietic, that is, autonomous, self-regenerative and operationally closed, life-form; in his opinion, "Pynchon uses the duck to fold the 18th Century world of automata into the 20th Century world of artificial life, nanotechnology, and 'cell-sized robots.'"[10] While Vaucanson and Pynchon's duck, then, might be two fundamentally separate gadgets, affinities nonetheless exist between the physical mechanism and Pynchon's textual appropriation: it is the capacity for autopoiesis, and the development of technique, that Pynchon detects in the historical automaton. In *Mason & Dixon*, a book about Enlightenment practices designed to enclose the planet but whose processes ultimately are subject to "phantom rebounds"[11] between technology, science and the undead, the duck inevitably functions to raise questions of proximity and cross-over: the sense of trespassed limits is evident not only in the mechanism itself, but also in its *ingénieur*. These close encounters are at hand right from the start; they can be distinguished in the pamphlet designed to explain the exhibition of Vaucanson's duck, so careful to identify the apparatus as a "[mathematical figure],"[12] while they also align engineer, at least in Pynchon's novel, with Victor Frankenstein et al. Turning the duck into a "'Design' of quite a different order," Vaucanson clearly is a borderline character, whose "Ingenuity," "Attention to Detail" and "Fineness, passing some Critickal Value, enable'd the Duck [a] strange Metamorphosis, which has sent it out of the Gates of the Inanimate, and off upon its present Journey into the given World."[13]

Following this "superaddition,"[14] a supplementary function that introduces a sexual drive—and thereby yields, in a hollow, inorganic centre, the possibility to create new life—the duck becomes self-aware; it transcends the limitations of its design. Human input, consequently, whether in the shape of prepared waste matter—Vaucanson's duck intends to demonstrate "the Mechanism of the Intestines"[15]—or as erotic impulses, no longer produces any predictable outcome. The result is a complex and variable system whose activities, or even nature, defy explanation, a condition that, yet again, exists already at the outset: the duck's digestive process is fraudulent, its transparency, so as to allow a glimpse inside, only apparent. The functions it performs, within and outwith Pynchon's text, remain inscrutable and fundamentally unintelligible; as much as the duck forms part of the Enlightenment project to replicate, and therefore explain,

organisms by means of machines designed to "exhibit the meanings of bodies,"[16] it also, conversely, both demonstrates and executes the idea of black-boxing. It is this concept that exists at the centre of Berressem's argument, interested in the progression from automaton to autopoiesis; the black box operates as basic cell and source of the technological development that proceeds from the 18th Century to postmodernity, just as the duck shifts, in its representation, from Enlightenment body to "poster child for the posthuman."[17]

A metaphor and system that derives from cybernetics, the black box calls into question the affected dimensions between animal, human and machine, because both flesh and engine are configured in terms of their respective, as well as integrative, performance enhancement. It is a model that, as W. Ross Ashby writes, is "open to energy but closed to information and control," and which is analysed in terms of its input and output: the black box is an internal mechanism "not fully open to inspection,"[18] whose essence is that of the occult. A reference to the "death-cult inside of techno-culture,"[19] the black box, however, further links up duck and Pynchon's *Schwarzgerät*, the latter an almost literal translation of Ashby's term; the *Schwarzgerät* is the "womb"[20] to and from which rocket-child or man-machine will shuttle. Black-boxed and forever a creature at the margins, the duck, as Jessica Riskin argues in her paper on the "Ambiguous Origins of Artificial Life," was "the improbable forebear of modern technologies designed to simulate animal and intelligent processes."[21] She continues to remark that "[q]uaint as the Duck now seems, we remain in an age that it inaugurated," that it "set in motion a dynamic that has characterised the subsequent history of artificial life."[22]

This article is interested in exploring duck dynamics, and does not thereby necessarily pay close attention to the discrete dimensions that set apart Vaucanson's device from its successive appearance in Pynchon's novel. After all, this is an exercise that reflects its subject matter and that, while aware of borders—the lines of division and zones of interpenetration that the duck occupies—it also proposes to pass beyond them; the point is to determine a "vocabulary of curves"[23] with respect to the trajectory engaged in by automatic fowl. The cross-hatchings[24] carried out by these mechanisms, which also include the sentinels that Benjamin encounters, lead, in due course, into the "age" that the duck instates: if Vaucanson's replica operates as a prosthesis for its inventor's ineffective digestive tract, then his design prefigures the clone stories to come.[25] It remains difficult to pinpoint exactly the rise of the machines or womb of the cyborg, whose origins can stretch back far,[26] yet a case can be made to at least comprise Vaucanson's duck, passing through adjustments and near-likenesses in Benjamin's arcades and Pynchon's emerging/rocket States. Bear in mind that as a double, a body wired into perfection, the duck is the product of a dreaming subject who achieves the realisation of a flawlessly functioning body part as machine: it is a dream technology that, after World War II, raises cybernetic organisms that continue to capture the

figuration of an ideal. A "condensed image" of fiction and material reality, "the two joined centres structuring any possibility of historical transformation,"[27] the duck, like future man-machines, is equally mirror and early manifestation of what we will be, or would like to become.

Cyborg ontology consists of an amalgamation between soft, organic and hard, inorganic components, a merger that, for Vaucanson, still only exists on the level of the *Vorstufe* or pre-launch: his duck is an external improvement that projects perfection into an adjacent being. And yet it functions as a harbinger of things to come, the "border war" that Donna Haraway celebrates;[28] it holds, within its lifelike approximation—[n]ot only every bone has been imitated, but all the Apophyses or Eminences of each Bone"[29]—the potential for post-human evolution. Although the duck, in *Mason & Dixon*, clearly acts as a symbol of machine ascension, it is not simply Pynchon's interpretation of the historical device that prompts such readings, which include Berressem's piece so attuned to shifts, extensions, and verges. The device's propensity to take to the air—a capacity for flight that seems apparent in the above illustration (Figure 1) in which the duck, standing sideways, threatens to fly out of the frame—manifests itself in both its 1738 incarnation as well as in articles about the physical object and the engineer's factual legacies in terms of a growing (American) techno-supremacy. These essays, written by Silvio Bedini and Derek J. De Solla Price, were published in the same volume of *Technology and Culture* in the winter of 1964; they are investigations into the role and development of automata that unequivocally declare Vaucanson, if not the duck, as a pivotal figure in a narrative demonstrating its faith in a totally technologised existence that, in the 1960s, consolidates into the shape of the rocket.

Daniel Cottom argues that "[the duck's] emblematic status has lived on to the present day in both scientific and popular literature,"[30] although he relegates his mention of the device in Pynchon's *Mason & Dixon* to a footnote, an underworld to keep the device contained when it shows such inclination to move beyond its limited spheres. Cottom contends that "the duck is finally a more provocative object than [the] docile androids,"[31] the flute and tabor-playing figures, modelled after a sculpture standing at the entrance to the royal gardens at the Tuileries, that place it at their centre. The duck already manifests a voracious desire to over-reach its nature and environment, a state of affairs that is most apparent in Pynchon's novel but is latent in Vaucanson's work too; this dormant feature fully emerges in the *Technology and Culture* contributions that, more generally, focus on the inventor's significance at a time when a techno-revolution is either in progress or otherwise imminent. In effect, what Bedini and De Solla Price's papers execute is the hyperbole of the technological imperative, the reconstruction of culture as science fiction. The duck, consequently, becomes one function or symbolic object in a long chain of associations that leads from "[mathematical figure]" or plaything, depending on the vantage point, to mechanisation and, eventually, to the emergence

of USA superpower. The trajectory appears self-evident and irresistible, perpetuated by supermen-scientists before self-perpetuating by ostensibly autopoeitic machines; this order of total technique here is a product of an exuberance that acts as a sign of the times: the technological sublime that pushes out of rocket systems.

An aesthetic response, the sublime defines itself through "continual redeployment," as David Nye suggests, and is "not part of a static view of the world;" in time it shifts from the observed to the observer, the outside to the interior, and comes to associate technology with the formation of a super-race: sublimity is linked to "inner powers, which can in thought outreach [...] external objects."[32] It further, so Nye continues, "undermines all notions of limitation,"[33] an unsurprising characteristic bearing in mind that the sublime "has always located itself between discrete orders of meaning," referring, at once, to its "border war" between magnificence and horror, a boundary breakage that anticipates "excess signification."[34] Although Nye treats atom bomb and Apollo 11 in the same chapter, as "new forms of the dynamic sublime," he keeps up a gap—a section break at the very least—between these two gadgets, as if the moon rocket existed as a counter-force to the "death-world"[35] of the nuclear weapon. They are, though, part of the same system that explodes power into infinity, and it is this sense and potential of angelic superpower that feeds Bedini and de Solla Price's articles which, in equal measure, carry (and bury) the spectres of the Manhattan Project.

In this vein, consider Bedini's sequence of progress:

> The first complex machines produced by man were automata, by means of which he attempted to simulate nature and domesticate natural forces. They constituted the first step in the realisation of his dream to fly through the air like a bird, swim the sea like a fish, and become the ruler of all nature. From these attempts to imitate life by mechanical means, man subsequently utilised the principles involved to produce the complex mechanisms which have resulted in the technological advances of the Space Age.[36]

A case in point with regards to the by now clichéd, but still extremely potent, ideology of "man's" triumph of the will, Bedini's words, a narrative that glides through the ages, join an even larger cultural movement whose attention, as the previous issue of *Technology and Culture* attests, is very much focused on the "Space Age." In the autumn of 1963, the journal assigned a special edition to the history of rocket technology, which chronologically advances from the V-2 to Vanguard, Redstone, Atlas and Titan, ending with Polaris and the Soviet ICBM effort. On the back of this investigation, which looks to the future by means of ever more efficient ballistic missile development, follows a backward glance that discerns the beginnings of kill mechanisms in playthings, whose practical applications "[culminate] in modern automation and cybernetics."[37] There is, as ever, this impression of an evolutionary peak to be attained, a conviction that is also on display at the World's Fair in New York, which opened on 22 April 1964, just as rockets were prepared to arch into space. Among its attractions, the Fair, similarly arranging a coherent forward momentum, included a simulated voyage in a time-travelling pod; a

collection of missiles and spacecraft; and a giant, hollow steel globe, a world carved out of cold metal encapsulating an existence cast into shape by technology.[38] Bedini's history of automata has, consequently, to be thrust (back) into the assembly of the rocket, the environment and device where it belongs, but to move backwards in these circumstances —from ICBM to prototype space age gadget to ICBM again—also suggests a progressive entanglement as well as a moment of no return.

An impression that mainly arises due to Pynchon's description of the V-2 as a "ghost in the sky—the missile falls faster than sound and "[catches] up to what's already death and burning"[39]—the act of looking back, rather than absolutely indicative of rational advancement, instead implies the existence of an endless feedback loop, whose presumed point or peak of closure coincides with the instigation of a "death-world." To be sure, Bedini's exuberant rhetoric does not allow for such intimations of disaster—his surface world stays undisturbed—but, from this perspective that takes into account the Cold War context, it becomes impossible to "unsee"[40] that this culmination ultimately means Ground Zero. The ruins of the future are accessed through the black boxes of early automata, containing the nuclei of coming devastations; as such, the necessary methodology with which to analyse explosive systems is to travel to a stage before apocalypse,[41] to a time when such propositions appeared still falsely innocent. It is, of course, not innocence that Bedini searches; his aim is to interpret history, now four-dimensional,[42] as singular force "governed through the movement of [...] androids."[43]

It is also under those conditions, the history of automata hardwired to rocketry, that De Solla Price's contribution functions; his article analyses the meaning of bodies bound up with conceptions of the universe. Correlations between celestial and corporal models indicate a process of mirroring or else of excavation: the world above is reflected below, and unseen insides are exhumed in appendages like transparent avian artefacts, water-clocks or sun-dials that attempt to contain the unknown on a finite scale. De Solla Price's starting point is much the same as Bedini's, a "steady advancement of technology" that begins with simulacra and automata as "progenitors of the Industrial Revolution," leading "up to and including the age of the electronic computer."[44] De Solla Price does not specify the latter, but Paul Edwards does: it is an "age" defined through the processing unit that realises the "technological possibility of the Cold War."[45] Computers control the Cold and post-Cold-War high-tech weapons systems that aim to provide total area defence: atomic shield, containment culture, National Security State—fantasies of invulnerability that lie as if enclosed. The world is not only "susceptible to mechanistic explication,"[46] it is, above all, reined in by machines. De Solla Price's subject is simulation and, by extension, containment: information stored inside automata that themselves spawn computerisations. What is most apparent, here as much as in Bedini's article, is the language of integrated systems.

It is this discourse of incorporation—the planet as closed world; visions of centrally-controlled world-wide networks of communication—that binds the two essays together: their narrative of progress evidently is also one of C3I and therefore forms part in the ideological projects of the Cold War. If Bedini's piece is integrated into the continuing American ICBM development, a process that at this time manifests itself in ever larger missiles, then De Solla Price's essay with its focus on miniaturisation and encapsulation gestures towards the emergence, in the late 1940s, of satellite studies. Never mind that satellites, primarily, seem to perform as spectacle, too,[47] the relations between satellite vehicle and simulacra are striking: both are world-circling spaceships that keep the planet under surveillance. These little worlds are world reductions that compress space into (black) boxes. If Don DeLillo, in *Underworld* (1997), claims that "[a]ll technology refers to the bomb,"[48] then these investigations—engaging in the four-dimensional "dynamic revolution in man's comprehension and exploration of reality"[49] that results in the creation of space sciences— posit the following: all technology emanates from a shitting duck.

This statement, slightly twisted, rests on the back of a comment that Bedini makes; he announces that, "unquestionably," Vaucanson "was the most important inventor in the history of automata, as well as one of the most important figures in the history of machine technology."[50] His conclusion does not directly apply to the duck but, more so, to Vaucanson's later developments of industrial machinery, which comprise an automatic loom in 1747, imitating the weaving of patterned fabrics and brocades, and including, by 1760, an "industrial metal cutting lathe with prismatic guideways."[51] The cutbacks resulting from such inventions obviously affected the labour force, and although the inventor's apparent objective was to establish standards, the machine appears to operate as a vengeance weapon in the war "dictated [...] by the needs of technology ... by a conspiracy between human beings and techniques."[52] If the duck figures as the precursor to Cold War gadgets, then the foundations for this comparison depend not simply on an intertextual awareness of Pynchon's work, stretching from *Mason & Dixon* back to *Gravity's Rainbow,* but further develops due to a reading that is alert to Cold War logistics and chain reactions, irrespective of whatever properties were inherent in Vaucanson's device. Bedini thinks that the succession between "flying angels," duck and industrial inventions was "inevitable" for Vaucanson, whose later contraptions "subsequently achieved technological importance;" in his listing, Bedini proceeds to mention the "flexible tube of India rubber (caoutchouc), which was to have a variety of applications in many fields."[53] His reference relates to the material's application to simulate the duck's intestine and leaves it at that; what remains unsaid is that rubber softness, used to coat the hands of the flute-playing automaton, touches upon the extractions of empire.

Rubber stretches over limbs of steel; it is the product of choice to build a vascular system as well as digestive organs and skin-like shells made up of elastic gum to be executed in the country where the caoutchouc tree is indigenous.[54] The project entails the construction of "an automaton containing the whole mechanism of the circulation of blood,"[55] a task that is abandoned—it is not carried out in Vaucanson's lifetime or in the empire of his birth. To append the duck to future forms, to its prospective, "prismatic" transfer applications, in time leads to the creature's upgrade from bloodless automaton to cyborg in the "age of the electronic computer." The design that comes to mind, considering the rubber husk that either shrouds or assists a metal exo-skeleton, is the "hyperalloy combat chassis"[56] of Arnold Schwarzenegger's T-800, so quickly obsolete: the Terminator is the direct descendant of Vauncanson or the Cold War's chain productions. In this vein, Goethe's sighting of the duck in 1805, when he found a derelict item, a "duck without feathers [...] like a skeleton,"[57] is an indication of things to come; it is a harbinger of Schwarzeneggerian end-times technology, whose affiliations with empire/vampires reach beyond rubber skin. The trajectory that Bedini and de Solla Price trace, then, goes "pure ballistic."[58]

In Pynchon's *Mason & Dixon*, the automatic duck chases Armand Allègre, a French chef and renowned cook of ducks, to avenge lives lost for dishes, before it falls in love with him. By now self-aware, the duck utilises its mechanisms to "penetrate all known Fortification, solid walls being as paper to this Juggernaut … One may cower within, but one cannot avoid,—*le Bec de la Mort*, the … 'Beak of Death.'"[59] As lover/avenger, it behaves as angel of, and against, death and thereby straddles two worlds, separating the living and the dead but, more importantly, because it concurrently acts as aggressor and defender. As the novel progresses, it occupies an ever weirder, more precarious position on earth, half belonging to and increasingly apart from it: the automaton exists between states of being, now and then "shimmering into Visibility"[60] before vanishing again. Its superpower influences "the shape of [its] Destiny [,] pull'd Earthward and rising Heavenward at the same time:" it gains "an order of Magnitude, in passing from the personal to the Continental. If not the Planetary."[61] As the United States is twisted into form, the duck—likewise a dream—expands as if ingesting, but also feeding off, injustices; so clearly fictions transposed into existence, duck and rising empire reach a point of correspondence, even though the association between them always remains conflicted. The duck's status as victim or agent of empire is never entirely clear, although its legacy as antecedent of rocketry is, by this point, transparent.

Mason certainly suspects the duck "to've become a Planet,"[62] an impression he infers by reflecting on the transit of Venus, a usually invisible, "Luminary" planet rarely passing into the fields of perception as a "Solid Spheroid."[63] "But," so thinks Mason, regardless of the "logickal Chasm," the temporal gap, that lies between the invention of the duck and

the observation of the transit—a difference spanning over thirty years—"could it be," he continues,

> that in the Years since the Duck vanish'd, and despite the constant presence of the Duplicate the World knows, Monsieur Vaucanson, in his perusals of the Sky, has come to seek there wonders more than merely Astronomickal? For, having no idea of where or how far his Creature's 'Morphosis may've taken it, where to look for Word of its Condition with more hope of success than among the incorruptibly divided Rings of Heaven?[64]

The device has, over the course of the Cold War, become a manifestation of the technological sublime, continually redeployed in vehicles that grow from the size of ducks to the dimensions of white whales or octopi.[65] As a stand-in for the technological achievements of "the age of the electronic computer," its appearance in *Mason & Dixon* has to be considered adjacent to those other "Luminary" spheres or stars that navigate the sky and *Gravity's Rainbow*. It is at the interface between two novels, at the points of intersection between Enlightenment and Cold War technology, that the duck's planetary inflation takes place: it sits at the central nexus from which space gadgetry emerges.

Glass Reich

At the entrances to arcades, in the vicinity of bridges or at city limits—areas that split one element from another—stand gatekeepers patrolling the borders, or facilitating crossovers between states. These are curious sentinels, less interested in issuing warnings than in signalling pathways into other worlds. The standpoint and material forms of such guardians—come across in dream spaces that Walter Benjamin proceeds into in *The Arcades Project*—concern the last part of this essay on mechanisms of the threshold; their nature and origins, already indicated by their spatial occupation at the margins of architecture and habitat, are ambiguous, so easily able to reveal, or transform into, apparent opposites: inside/outside, earthly/outlandish, the living and the lifeless.

It is less Benjamin's exploration of urbanity in *The Arcades Project* that merits attention in this argument than his observations on the peripheries of, and matter utilised in, places of exchange: the passage ways and shop windows that, realised in glass, form "zones of special effects where optical illusions, tricks of light and transformations readily occur."[66] Esther Leslie argues that Benjamin "attempt[s] to trace the ur-form of consumerism" in his monumental assemblage; she further notes that the "arcades were a receptacle for the dreams of the nineteenth-century masses and their masters. The arcade houses a collective body, who wears it like an exoskeleton."[67] In terms of the material of construction, however, the arcade's exoskeleton is made of iron and steel, over whose structures of support are sheathed translucent envelopes: iron, steel and glass are, for a while, used "in the context of utopia," in buildings "that serve transitory purposes".[68] The utopian possibilities of such matter, though, are themselves "transitory," a shift in function that is apparent in *The Arcades Project*, simultaneously functioning as "critique and monument to the glass culture of the 19th Century," [69]

as Isobel Armstrong observes. This sensibility concerning glass, in terms of both its functions and properties, defines Benjamin's work, so attentive to the contrary states and indeterminacies that glassed-in spaces transmit in and of themselves. The prefix trans-, presaging movements across, really is key here: transparent and transitory, glass prompts transformations.

A study on fetishism, *The Arcades Project* invariably includes references to World Expositions: the Crystal Palace is a space "dissolved in lustre."[70] The "art of the dazzling illusion"[71] is similarly generated in arcades, producing analogous effects with regard to the reception of objects, invested with an intensified brightness along seemingly interminable glass-roofed corridors and enclosed promenades. Inside, areas of circulation are set up, a process that is already reflected in the designations conferred to such locations, beginning with the word passage: "Passage des Panorames, Passage Véro-Dodat, Passage du Désir (leading in earlier days to a house of ill repute), [...] Passage du Pont-Neuf, [...] Passage de la Trinité."[72] These "transitory" spaces bring into being patterns of transition that Benjamin also develops elsewhere in *The Arcades Project*, in his entry on subterranean Paris.

The correlation between arcade and underworld emerges throughout this collection, in which Benjamin compares the *Métro* to a "system of galleries"[73] running below the city. He provides an "underworld of names" recording the "collision" and "intersection" of words corresponding, aboveground, to the "linguistic network"[74] of Paris and drawing together, in certain cases, the names of saints and industrialists or *ingénieurs*. Every so often, Benjamin supplies fragments of data, inserted between larger blocks of text, on murders committed in certain spots, or on designations pointing to perspectives that no longer exist, as if the conjunction of streets, and therefore of names, had caused pockets of violent eruption. Composite terms associating the unearthly and timeless with the earth-bound and passing thus announce, like their material counterparts—the intersections of streets above and below ground, the crystal boulevards of the arcades —gateways leading past the known limits of the city into regions of gloom, establishing links between the realms of the living and the immortal, or undead. At these points of transition, as one configuration of geography subsides into another, unfold the "more secret, the more deeply embedded figures of the city: murder and rebellions, the bloody knots in the network of the streets, lairs of love, and conflagrations."[75] Time and again, Benjamin returns to the sudden conversions occurring, for example, when day shifts into night-time, the waking existence into sleep, and "inconspicuous places,"[76] passed by and overlooked during the daylight hours, turn into zones of threat that lie hidden, ghost-like, inside familiar and unremarkable urban settings. Engaged in an effort to offer a text, modelled on "dream interpretation" as his translators claim, as a map to what Paris can be or become, Benjamin comments on the "phenomenon of the boundary," lines

that proceed across the city which is only "apparently homogenous" but whose name, even, "takes on a different sound from one district to the next."[77]

At such interfaces, Benjamin observes entities he refers to as "guardians of the threshold:"

> In front of the arcade, the skating rink, the swimming pool, the railroad platform, stands the tutelary of the threshold: a hen that automatically lays tin eggs containing bonbons. Next to the hen, an automated fortuneteller—an apparatus for stamping our names automatically on a tin band, which fixes our fate to our collar.[78]

The sentries are mechanical: a motorised hen that, so Benjamin reiterates a little later, "lays golden praline-eggs" next to other machines that "[weigh] us,"[79] or predict the future. "[G]enerally found [...] neither on the inside nor truly in the open," they "protect and mark the transitions" into other elements, weatherless and sheltered in the case of the arcades, or into demi-mondes like parks carved and sculpted into the heart of the city, over which "these mysterious *penates*,"[80] domestic deities, also watch. The impressions such devices exude as they occupy the doorsteps and entrances to galleries relate to the potential for expeditions into earlier periods or times to come—Benjamin writes that arcades are "galleries leading into the city's past"[81]—or else toward mutations, instigated by way of the things on show inside. There is, however, an indication that crossings into arcades or into similarly inorganic worlds are journeys of no return; at points of access, mailboxes function as "a last opportunity to make some sign to the world one is leaving."[82]

The border gates of shopping precincts, much like the triumphal arches which once designated the spot when a city ended, "[transform] whoever passes under [their] arch."[83] The tin or golden eggs produced where two worlds meet signal the new forms of life incubated inside, under glass. Consequently, the "fate affixed to our collar" is that of radical transformation and of transitions set up between the living and the lifeless. This turn of events happens by means of fashion too, another phantasm that promises enhancement but in reality is nothing other than "the parody of the motley cadaver," a "provocation of death" and "bitter colloquy with decay whispered between shrill bursts of mechanical laughter."[84] According to Benjamin, fashion stands "in opposition to the organic" and "couples the living body to the inorganic world" by chopping it up, fetishizing it into close-ups of features: "each single part is exalted through a trope, secretly [linking] up with the image of the corpse."[85] Fashion, then, defending the "rights of the corpse,"[86] superimposes living with dead flesh: the realms of dreams and death so quickly overlap. Glass houses are frontier regions where organisms become encased by inanimate objects; built from ashes, they are places of conversion heralded over by automatic hens, "guardians of the threshold" whose mechanisms of "repro*duck*tion"[87] contain not bonbons but dead matter. Out of golden eggs hatch the non-living.

The linkage between glass *reich* and automatic duck forms an arc that is, to be sure, traced by proxy, by way of other mechanical fowl. Yet it is steeled, on the one hand, by their corresponding borderland states and, on the other, through the "vocabulary of curves" that aligns automatic duck to its space age successor: the cyborg. In his article on the subject, Berressem refers to Claus Emmeche who, in his book on artificial life, argues that the difference between the latter and AI "has to do precisely with the introduction of a sexual drive and a metabolism."[88] Emmeche further mentions, so Berressem reports, that the "seminal characteristic of artificial life is that it follows a logic of emergence, which means that it is self-organising;" Pynchon's duck certainly exhibits this "emergent behaviour," comprising "organisation, generation, nutrition, development" and "susceptibility to illness and death."[89] The "emergent property" that is missing, however, in this list of criteria, is one that Warren Steele, applying W. Ross Ashby's method of analysing the unexpected results of mergers, employs with respect to the cyborg, whose "blend of bone and steel" yields a "singular image."[90] The imperative is to "[s]trip away the skin to reveal a hard metallic frame, but wipe away the blood and that frame becomes a mirror: Organic + Inorganic = Cyborg = Glass."[91]

Steele's project is intent on dismantling Haraway's cyborg myth, though the figure remains in some ways marginal, if not in relation to its potential to break the death-grip of the war machine. Haraway "takes pleasure in the confusion of boundaries," a "border war" that holds the promise of a "social and bodily [reality] in which people are not afraid of their joint kinship with animals and machines, not afraid of permanently partial identities and contradictory standpoints."[92] It is a creature whose point of origin is a liminal space, the interface between man and machine, and whose "kinship," according to Haraway, also connects it to resistant politics, the marginalised communities that push against a hegemonic centre. And yet, despite its root liminality, the cyborg stays a brutal figure which, paradoxically, still very much occupies the centre of strength: ground zero of superpowers.[93] Its glass configuration—note the implicit "kinship" with a once utopian and decidedly fascist techno-culture which Blicero, for one, makes explicit in *Gravity's Rainbow*—exists both metaphorically and literally: it is a *doppelganger*, the living mirror that returns images of perfection.[94]

At the nucleus of Steele's argument sits Arnold Schwarzenegger, the now archetypal image of the cyborgic killing machine, yet his glassy body—bear in mind that he arrives, in *T3: The Rise of the Machines* (2003), on the outskirts of LA inside a mirrored ball, "as a kind of mirror himself"[95]—only indicates one of the cyborg's functions as a reflective surface. To totally recall, Vaucanson's duck performed an out-of-body improvement as much as it returned its environment; it is only a matter of time before automata and glass interface. Not only do they stand in close proximity to each other, the one guarding the access points into glass passages, they also resemble each other: they share the same dialectic, the "*jeux de glace*"[96] that continually engage in self- and inter-reflexive

references on ambiguity and marginality/centrality. If Schwarzenegger's T-800 signals this moment of consolidation, it follows that the cyborg thereby claims lineage with its "*glas*" antecedents, those that perch on the edges of systems materially articulated through glass or *glace* (mirror/ice).[97] Even more importantly, Schwarzenegger carries the "legacy of Trinity, and the glass produced at the instant of its detonation":[98] the advent of a super-star in LA, this "luminous capital," corresponds to the explosion of a "bright angel of death."[99] Archetypal and prototype cyborg, Schwarzenegger and automatic duck, form a passage or death knell that opens up into a tomb-world.

If Schwarzenegger's rubber and alloy death star is hitched to Trinity, then Vaucanson's duck, having passed through Pynchon's as yet/about to be formless United States, is similarly related to forces that combine *glas*, meaning death knell, light and super-power. In *Mason & Dixon*, the duck is drawn to the line, a likely transitional point or condition for an automaton to haunt; the line equals light, if only metaphorically, and its influence is already in evidence here. It sends live fowl and people, "simple Tools"[100] executing orders unthinkingly, to sleep; its path leads back to *Gravity's Rainbow* and to the arc of the ballistic missile whose order is both established by, and establishes, "*Kadavergehorsamkeit*,"[101] the conformity of the corpse. In Pynchon's 1973 novel, human-machine integration, as ever bound up with rocketry, imagines the shift from old to new "Deathkingdom:" Blicero's utopia is made of glass, light, whiteness and ice.[102] Benjamin's arcades, old empire marked by automata, are replaced by "death-colonies"[103] on the moon, put there through the rocket, threshold mechanism that allows new glass architecture. The similarities are striking not simply with respect to duck and rocket-child, the translucent cyborg—Gottfried and Blicero/Weissmann are equally ultrawhite—which is its progeny, but also concerning automaton and delivery vehicle. The hardware of the missile, like the duck in *Mason & Dixon*, raises issues concerned with states of detection.

Gravity's Rainbow, then, adds another sign of what the duck turns into; a tutelary at glass spheres and component of Cold War technology, it now forms part in a discourse of death whose most potent symbol is that of the prototype ICBM. As the duck progressively increases speed and loses visibility in *Mason & Dixon*, it is accompanied only by a "loud terrifying Hum;"[104] the question that presents itself is whether the resonance is produced before or after its arrival. Either way though, it portends catastrophe, visions of a planet laid to waste by what "extropy,"[105] machine ascent, moves towards. A precursor to, and mirror image of, future transcendental technologies comprising the "advances of the Space Age" and the atom bomb, with which it shares so many affinities—the atom is both earthly and extraterrestrial;[106] the bomb is similarly interpreted as both shield and sword—the duck ceases to function as sentinel: it is the source of new worlds. After all, it grows into a planet, more specifically into Venus, indicative of (gadget) love though it also comes with "the means to raze

[worlds] to the ground:"[107] initiator, a clear example of technology as a reconstruction of global environments, it also serves as terminator. Gadget love ultimately advocates the embrace of the missile; consequently, the arcs of the "Passage de la Trinité" reveal themselves to be ballistic trajectories that lead towards a "great glass sphere" presided over, and ushered into, by duck or Cold War gadgetry. The note, the "last sign," left at the entrance to a glass *reich*, deposited in the mailboxes situated on this threshold, read the following: "Death only rules here."[108]

Author's Notes

To Warren Steele, for his continued inspiration.

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End notes

1. Steele, pp. 34–35.
2. Ibid, p. 37.
3. Ibid, p. 46.
4. Edwards, p. 1.
5. Hence alien interventions in, for example, *The Day the Earth Stood Still*, in which Klaatu comes to warn Earth Inhabitants to cool it down with respect to nuclear power, which has the capacity to ignite worlds.
6. Leslie, p. 113.
7. Steele, p. 163.
8. Pynchon (1973), p. 723.
9. Berressem, p. 74.
10. Ibid., p. 75.
11. Rickels, p. xiii.
12. Vaucanson, p. 3.
13. Pynchon (1997), pp. 373, 372.
14. Vaucanson, p. 21.
15. Ibid.
16. Cottom, p. 54.
17. Steele, p. 31.
18. Ashby, pp. 4, 86.
19. Rickels, p. xii.
20. Pynchon (1973), p. 750.
21. Riskin, p. 599.
22. Ibid.
23. Pynchon (1973), p. 32.
24. The term "crosshatching" is adapted from China Miéville's *The City and The City*.

25. “Clone Story” is the title of one of Baudrillard’s investigations into simulacra. See Baudrillard.

26. See Steele, p. 144.

27. Haraway.

28. Ibid.

29. Vaucanson, p. 22.

30. Cottom, p. 54.

31. Ibid., p. 57.

32. Nye, pp. xiv, 5, 7.

33. Ibid., p. 60.

34. Tabbi, pp. xi, 17.

35. Nye,pp. 225, 228.

36. Bedini, p. 24.

37. Ibid., p. 41.

38. Carter, pp. 1–2.

39. Pynchon (1973), pp. 49, 48.

40. Another verb borrowed from China Miéville.

41. As mentioned earlier, I am very much indebted, here, to Warren Steele, whose analysis of the cyborg rests on precisely this backward movement. See Steele, p. 42.

42. Emme writes that “the fourth dimension has been brought sharply into the realm of human comprehension and utility by the release of nuclear energy and the advent of astronautics.”. Emme, p. 377.

43. Bedini, p. 41.

44. de Solla Price, pp. 9, 10.

45. Edwards, p. ix.

46. de Solla Price, p. 9.

47. Hall cites a RAND study conference from 1949, in which the first function of the satellite is specified as “spectacle”. The second, related, aspect is “a demonstration of US technological superiority,” a comment that is highly ironic, considering Vanguard’s later spectacular failures. Hall, p. 431.

48. DeLillo, p. 467.

49. Emme, p. 379.

50. Bedini, p. 36.

51. Fryer and Marshall, p. 268.

52. Pynchon (1973), p. 521.

53. Bedini, pp. 36, 37.

54. Fryer and Marshall, pp. 268–269.

55. Ibid., p. 268.

56. Cameron.

57. Wood, p. 33.

58. Pynchon (1973), p. 7.

59. Pynchon (1997), p. 374. The references to Shelley’s *Frankenstein* (1818) are clear here: the duck, like Frankenstein’s creature, wants a mate.

60. Ibid., p. 448.

61. Ibid., p. 449.

62. Ibid.

63. Ibid.

64. Ibid.

65. Mailer writes about the Saturn V as whale, p. 54; Pynchon links both rocket and rocket cartel to an octopus in *Gravity's Rainbow*, also gesturing towards Frank Norris' 1901 novel *The Octopus*.

66. Leslie, p. 96.

67. Ibid., pp. 97, 113.

68. Benjamin,, p. 4.

69. Armstrong, p. 166.

70. Benjamin, p. 541.

71. Ibid., p. 537.

72. Ibid., p. 33.

73. Ibid., p. 84.

74. Ibid.

75. Ibid., p. 83.

76. Ibid., p. 84.

77. Ibid., pp. ix, 88.

78. Ibid., p. 86.

79. Ibid., p. 88.

80. Ibid.

81. Ibid., p. 84.

82. Ibid., p. 88.

83. Ibid., p. 87.

84. Ibid., p. 63.

85. Ibid., p. 79.

86. Ibid.

87. Berressem, p. 75.

88. Ibid., p. 74.

89. Ibid., pp. 74–75.

90. Steele, p. 147.

91. Ibid.

92. Haraway, pp. 150, 154.

93. Steele, p. 184. See also footnote p. 95, where he notes that, for Haraway, the "cyborg manages to escape [the patriarchal traps of heritage and tradition] because it resists wholeness in favour of fragmentation; thereby avoiding the centre in favour of the margins. Accordingly, marginality becomes a position of strength."

94. Ibid., p. 148. "Robbed of its flesh," Steele notes, "the cyborg reflects the environment that surrounds it, but when covered with skin, with a veneer of normalcy, it plays the role of the errant copy; that of the double or the doppelganger—the *living* reflection."

95. Ibid., p. 149.

96. Derrida, p. 7.

97. Ibid., p. 9. Derrida talks about “glas” in terms of a (death) knell, which is the French term’s translation. See also Steele, p. 187.

98. Steele, p. 149.

99. Pynchon (1973), p. 760.

100. Pynchon (1997), p. 669.

101. Pynchon (1973), p. 400. Incidentally, that word, *kadavergehorsam* is a term that Walter Rathenau uses in his treatise called *Was Wird Werden*. Berlin, 1920, p. 17. *Was Wird Werden* is reproduced in Rathenau’s *Gesammelte Schriften*, Vol. VI.

102. Pynchon (1973), p, 723.

103. Ibid., p. 722.

104. Pynchon (1997), p. 375.

105. Dinello refers to an Extropy Institute in Texas, whose aim is to improve and prolong life at hand of technology. Dinello, p. 28.

106. Soddy writes in *The Interpretation of Radium and the Structure of the Atom* that the atom “seems to claim lineage with the worlds beyond us” and continues that “[t]his tiny speck of matter we can hold in our hands exhibits in perfect miniature many ancient mysteries, forgotten almost in their familiarity, or mistakenly and too easily dismissed as belonging and appropriate to the infinitely great dimensions of the universe.” Soddy, p. 27.

107. Benjamin, p. 97.

108. Pynchon (1973), p. 723.

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