ISSN: 2044-4095

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Title: V2 to Bomarc: Reading *Gravity's Rainbow* in Context
Date: 2014
Volume: 2
Issue: 2
URL: https://www.pynchon.net/owap/article/view/62
DOI: http://dx.doi.org/10.7766/orbit.v2.2.62

Abstract:

In this article I argue that while Thomas Pynchon's 1973 novel, *Gravity's Rainbow*, is set primarily between 1944-1946 in Europe, it also simultaneously addresses itself to its own authorial context—that of the "Long Sixties" in America. In particular I consider details of Pynchon's employment at the Bomarc Service News in the years 1960-1962—the Bomarc being a surface-to-air interceptor missile manufactured by the Boeing Aircraft Company for the United States Air Force. Given that the V-2 rocket is the preeminent symbol of control in *Gravity's Rainbow*, I argue that we ought to consider *Gravity's Rainbow* in relation to the Bomarc, a technological descendent of the V-2, and a key defensive weapon in the Air Force's Semi-Automatic Ground Environment (SAGE), a centralised system for continental air defence, and the preeminent computerised command and control system of its time. The Bomarc was for these reasons a crucial component of a technical system of control that provided the primary material support for what Paul Edwards has described as the "closed-world discourse" of Cold War America. In light of this history I proceed to read the novel in terms of the operative presence of this discourse in the American public domain—in articles, newsreels and other media—demonstrating the manner in which the 'Rocket-State' of *Gravity's Rainbow* reconstitutes the human subject as a cyborg, thereby problematising the liberal humanist conception of the subject as discrete, autonomous and autopoetic. I supplement this contextual reading of the novel with formalist considerations for the manner in which the reader of the novel is implicated in *Gravity's Rainbow*'s own operations of closure and control, and argue that the reader of the novel is also, regardless of context, subjected to and by the act of reading the novel considered in cybernetic terms. I conclude the essay by reading the novel's closing moments against the grain of my own argument, and attempt to articulate a place of exception to the regime of control performed by the novel in relation its context and its reader.

V2 to Bomarc: Reading *Gravity's Rainbow* in Context

Joshua Comyn

Several critics have suggested that the true protagonist of Thomas Pynchon's novel *Gravity's Rainbow* (1973) is the V-2 rocket, or Aggregat 4.[1] If this is indeed the case, then it is a most unusual instantiation of such a figure, situated it would seem, simultaneously within and without the novel, ordering the action of which it too ostensibly is a part. Seen in this light, it must be the latter, German name that is suggestive of the true nature of the Rocket in Pynchon's novel: *Aggregat* corresponds to the English 'aggregate', and both words continue the Latin derived meaning of a 'complex whole, mass, or body formed by the union of numerous units or particles'.[2] Thus, it is already at the level of its technical German name that the Rocket[3] signifies its function as an agent of control, regulation, and order—not only of the fictional situation of the novel itself, but also, as I hope to demonstrate, of the historical situation of which *Gravity's Rainbow* is a part.[4] Following this contextual reading of the novel, I consider the manner in which *Gravity's Rainbow* concerns itself with the question of human subjectivity, and draw on my contextual analysis of the novel to lend further credence to known arguments regarding *Gravity's Rainbow*'s figuring of the human subject as cyborg and paranoid. However, in contrast to other critics I emphasise that the chief characteristic of the cyborg is its ability to self-regulate and that this quality entails an important structural equivalence between the cyborg and the liberal humanist subject. I then argue that the act of reading *Gravity's Rainbow* is a paranoid, meaning-seeking activity that extends the Rocket's aggregating force beyond the pages of the novel to address the novel's readers, thereby rendering them in its terms, as subjects to its rule. I conclude the essay by attempting, against the grain of my own argument, to articulate a place of exception to this rule of aggregation performed by the Rocket and its double, the novel in which it figures.

In the brief technical military history which follows, I am not concerned so much with the V-2 or Aggregat 4 rocket itself, as with the post war

DOI: http://dx.doi.org/10.7766/orbit.v2.2.62

developments that followed it, and which occurred to a great extent on the basis of the V-2's successful design and deployment in World War II; developments which include within their ambit the authorial history of *Gravity's Rainbow*. My work of contextualising *Gravity's Rainbow* is performed in the wake of Dale Carter's *The Final Frontier: the Rise and Fall of the American Rocket-State*, and can be seen as offering a supplement to this work: this essay analyses historical details that either are not treated in Carter's book, or are passed over in favour of other topics in his otherwise comprehensive study of *Gravity's Rainbow's* relation to its post-war American context—in particular, his focus on the role of manned space flight in extending and consolidating the post-war American 'Rocket-State'.[5] My further interest in the present essay is to consider how an investigation of *Gravity's Rainbow's* relationship to its authorial context has implications for understanding the nature of the human subject in the post-war era, a question whose importance Carter's own analysis of various characters from *Gravity's Rainbow* also attests to.

Rockets and computers: a very brief history

The V-2 rocket was the precursor of the modern ballistic missile, and the product of experiments conducted at Kummersdorf and Peenemünde under General Walter Dornberger and the scientist Wernher von Braun during WWII in Germany. After the war, the United States and the Soviet Union competed for access to this rocket technology, and for the scientists responsible for its development—a history that *Gravity's Rainbow* simultaneously recounts and fictionalises. The histories of nuclear and rocket technology are militarily and politically inseparable, as the novel itself suggests by the juxtaposition of certain details: first, the atom bomb which Slothrop learns about through a scrap of newsprint is like a tree,[6] and second, 'the Tree of Life... rooted exactly at the Bodenplatte' of the 00000 rocket.[7] While the years 1944-1946 with which the plot of *Gravity's Rainbow* is immediately concerned did not witness the combination of these technologies, in the years following the war, competition between the United States and the Soviet Union over the development of these technologies and their effective combination became increasingly tense.[8] Several important developments contributed to this situation. One such event was the first successful Soviet test of an atomic device (known as Joe-1 in the U.S.), which occurred on 29 August 1949.[9] The successful launch by the Soviet Union of both a multistage ballistic missile and the Sputnik satellite in 1957 was another such event, and altered the nature of US and Soviet Nuclear competition, which in the militarily terms of the late 1940s and early 1950s had been restricted to the use of strategic

bombers. This increase in competition culminated in the Cuban missile crisis of October 1962, which was a confrontation between the United States and the Soviet Union over the presence of Soviet nuclear armed missiles in Cuba.[10]

Thomas Pynchon had been working at Boeing Aircraft Company during this latter period (from February 1960 to September 1962), where he wrote technical articles for the *Bomarc Service News*, an internal Boeing company field service update.[11] The Bomarc (Boeing and Michigan Aeronautical Research Center Missile)[12] was a surface-to-air interceptor missile,[13] and one of the primary units of defensive arsenal in the Semi-Automatic Ground Environment (SAGE) of the United States Air Force from late 1959 to 1972.[14] With these facts in mind we cannot, as Steven Weisenburger has emphasised, underestimate the importance of this aspect of Pynchon's personal history, for he was quite literally 'a cog in the US war machine—closely involved in what was the most critical component of the military-industrial complex... his work—his gift for writing itself—had left... [him]... inescapably complicit with the bureaucracy of mass destruction and terror'.[15] The technological heritage of the V-2 rocket developed by the Nazis in WW2—which in the U.S. ran its course through the Thor and Jupiter Intermediate Range Ballistic Missiles (IRBMs), the Atlas and the Titan I Intercontinental Ballistic Missiles (ICBMs) and finally the Minuteman range developed by Boeing—played an undeniably important role in the configurations of the post-war world, a world that the narrator of *Gravity's Rainbow* refers to as being filled by a '[p]ost A4 humanity'.[16] But it is the Bomarc, that particular piece of American Cold War weaponry in whose service Pynchon wrote for almost three years, and which, when considered in the light of its particular deployment in American military and political history, explains much of what is significant about the totalising, aggregating nature of the V-2 rocket in *Gravity's Rainbow*, and also, much of what is significant in the novel's relationship to its long 1960s American context.

Paul N. Edwards, in his book *The Closed World: Computers and the Politics of Discourse in Cold War America* (1996), has noted how the political closure of the Soviet Union 'allowed it to function in the American consciousness as an enigmatic and terrifying Other.' This fact, together with the perceived Soviet nuclear threat, and developing rocket technology, fuelled the development of an ideological climate in America that Edwards has summarised as follows:

> [f]irst air defences, then strategic early warning and nuclear response, and later the sophisticated tactical response systems of the electronic battlefield grew from the control and communication capacities of information machines. As metaphors, such systems

> constituted a dome of global technological oversight, a *closed world*, within which every event was interpreted as part of a titanic struggle between the superpowers. Inaugurated in the Truman Doctrine of "containment," elaborated in Rand Corporation theories of nuclear strategy, tested under fire in the jungles of Vietnam, and resurrected in the impenetrable "peace shield" of Ronald Reagan's Strategic Defense Initiative, the key theme of closed-world discourse was global surveillance and control through high-technology military power.[17]

One particularly important material component of this situation was the previously mentioned Semi-Automatic Ground Environment, or SAGE, a system that was intended to consist of '...(1) a net of radars and other data sources and (2) digital computers that (a) receive the radar and other information to detect and tract [sic] aircraft, (b) process the track data to form a complete air situation, and (c) guide weapons to destroy enemy aircraft'.[18] The Bomarc missile that Pynchon wrote about for Boeing was one of these weapons.[19]

SAGE has a complex history (military, technological and political) that is rooted in the problem of continental air defence against potential nuclear air strikes by long range bombers, a threat that was exacerbated in the minds of American officials and civilians alike following the Soviet Union's test of an atomic device in 1949.[20] There is no need to review the history of SAGE in any detail here. For the purposes of this essay all that needs to be noted is the following: SAGE was the preeminent computerised command and control system of its time, that Bomarc missile development coincided with that of SAGE, and as early as 1953 it 'was also decided that the Sage [sic] system being developed by Lincoln Laboratories would be used to control the Bomarc'.[21] It is in this way that we can begin to see Pynchon's work at Boeing as forming part of a history that includes within its field of reference the V-2 rocket that is so central to the plot of *Gravity's Rainbow*. I am not suggesting that the V-2 is a symbol of the Bomarc in Pynchon's novel. What I am suggesting is that the theme of control with which the V-2 in *Gravity's Rainbow* is so strongly correlated, can and should be understood in relation to the real technological, military and political systems of control that incorporated the technological consequences of the V-2's invention—for in the authorial period of *Gravity's Rainbow* we witness the transition of the rocket from an offensive weapon with the purpose of threatening states, to a weapon designed to secure the state against airborne incursions, but which nonetheless contributed to a situation of perpetual (cold) war. I

am suggesting that the 'Raketen-Stadt' of *Gravity's Rainbow* has everything to do with the techno-ideological systems of the book's authorial context, systems whose ambitions of control were truly global, and which constituted an authentic, all-American, Rocket-State.[22]

Much of the above has already been established by Carter, who early in *The Final Frontier* connects Walt Disney's Experimental Prototype Community of Tomorrow (EPCOT) with the desire of many characters in *Gravity's Rainbow* to locate themselves 'within some universal plot or inviolable enclosure as a mechanism of personal security'—a observation which has strong resonances with the closed-world discourse identified by Edwards.[23] Moreover, Carter is well aware of the peculiar temporality of *Gravity's Rainbow* which, while its ostensible subject matter may be World War II and its immediate aftermath, is in fact addressed to the 'more proximate but equally hostile atmosphere of post-war American affluence... which came fully into being from the late 1950s onwards'.[24] Giving attention to the Bomarc and SAGE remains important however for the way it helps to cast light on the nature of the human subject in the post-war period. Carter is absolutely correct to focus on the role of manned space-flight in ensuring the continuity of Clive Mossmoon and Sir Marcus' "Operation" in the post-war era. But as Carter himself recognises, the Operation survives the Rocket-State's own supersession,[25] for one of the ways that 'Pynchon's Zone... anticipates the conditions of post-war American life ...[is by figuring]... the structures of power as increasingly predicated on the control of communication and the manipulation of images'.[26] Carter provides extensive analysis of the Rocket-State's manipulation of communication and media in the post-war era, but it is an analysis of modes of media and communication that are already in the process of being superseded by new media and communication technologies, ones that are dependent on innovations in computing that were in turn made possible by the United States military's investment in SAGE. The 'control and communication capacities of information machines' therefore, continue to both materially and discursively sustain the reality of contemporary surveillance and control so central to *Gravity's Rainbow* and its post-war context—up to and including (perhaps most especially) our own present day. A specific focus on SAGE and the Bomarc thus helps to explain *Gravity's Rainbow's* continuing significance, while simultaneously locating it in relation to its own authorial context.

Rockets and Computers in Post-War American Culture

In this section I undertake an analysis of certain media with the aim of demonstrating the aggregating presence of Pynchon's Rocket in the America of the 'Long Sixties' that preceded the publication of *Gravity's Rainbow.*[27] Paul Edwards is careful to note that despite SAGE's complex military and technological history, the debate concerning continental air defence was not merely a strategic, military affair, but included the American public. Among the media publications that Edwards cites in this regard are "For a Continental Defense", and "Night Fighters Over New York". The first of these articles, an essay authored by James R. Killian, Jr., the President of MIT, and A. G. Hill, Director of the Lincoln Laboratory, appeared in the November 1953 issue of *The Atlantic Monthly*.[28] This work is intended for an educated but non-specialist audience, and seeks to involve the public in the debate concerning air defence. While the authors appear diplomatic in setting out their views—they maintain that they support the traditional Air Force emphasis on offensive capabilities while arguing that these are not incompatible with the implementation of an effective defensive infrastructure that must not be overlooked—they are clearly trying to muster support for their work of building a SAGE-like system. The rhetorical strategy consists in the comprehensive mapping of a diplomatic 'there are multiple points-of-view', inclusive argument, on to an all-inclusive system of defence: '[o]ur real problem and decision are not concerned with any one separate concept, such as early warning, but the whole system of air defense and what will make it effective as a system'.[29]

The second article, "Night Fighters Over New York", published in the *Saturday Evening Post* in 1952, seeks to entertain as much as inform. The rhetorical strategy of this article is to combine the systems related strategic concerns that are a prominent feature of the Killian and Hill essay, with story-telling that is part comedy sketch, and part boy's adventure story. The serious subject matter of national security is ameliorated by a narrative whose protagonists are 'a stubby, wisecracking jet-fighter pilot known as "Killer" Kane and a big, good-natured radar operator called "Bull" Mileski'.[30] The problem of air defence is dealt with in a speedy, hyperbolic style that emphasises the up-to-the-minute, around-the-clock nature of the duo's work, and the complex infrastructure that supports it, enthusiastically and seamlessly incorporating man into machine: the pilots 'have electronic eyes that can see through any murk or darkness', and this means that '[t]hey can take off blind, fly to altitude and pick up the trail of an aerial attacker with vocal directions from a radar operator on the ground, track down the

enemy on their own airborne radar [and] shoot him out of the air without ever knowing what he looks like'. Thus configured, this android (whose component parts are pilot, radar operator, ground control, and their various instruments) is in turn incorporated into 'a far-flung system of radar warning and interception'; a 'huge electronic picture puzzle... [whose component parts]... speckle the face of Uncle Sam like spots on a boy with the measles'. All of this is rendered even more familiar by a vaudevillian performance by pilot and operator who, safely back on terra firma, engage in a happy exchange of insults:

> "When I go out on an intercept, it's just like taking a taxi," says Mileski [the radar operator]. "I merely tell the driver where I want to go."
>
> "I always think of myself as driving in a strange country," Kane [the pilot] shoots back, "and picking up some local yokel who happens to know the territory."[31]

SAGE was covered in other media as well. A 1956 IBM publicity newsreel —*On Guard!*—opens with an image of a rocket launch accompanied by the following voiceover: 'Protection comes high—sky high!'[32] It is protection the voice maintains, for 'the national resources that are so precious to us', as the image cuts to children playing on a merry-go-round. The rhetoric of unflagging vigilance encountered in *Night Fighters* is continued here, but in this case with reference to the SAGE computer which 'is on the job around the clock with twenty four hours a day reliability', and on whose display scopes 'computer results are instantaneously and continuously translated into graphic images'. The hyperbole is continued here as well, and is if anything even more extreme, characterising the computer in what begins to approach semi-divine terms. Over images of the interior of a SAGE centre that Edwards has described as an 'archetypal closed-world space',[33] we learn about the computer's 'memory': 'in case of enemy air attack, not only can a clear picture of the changing air situation be displayed on the scope, but if the airman wishes to see how things got that way, the scope can recall any previous phase of the situation on the computer's memory.' There is a cut to an operator's hand pushing buttons accompanied by the following voice over: '[b]y analysing the past, SAGE can project into the future.' This is followed by the recounting of a host of facts regarding the formidable data processing and storage capabilities of the computer, a narrative that is interrupted by a cut to a 'display scope' in which the flight paths of two objects, projected to intersect, are shown. In this segment there is no audio commentary, though there is sound: the gradual, but steady blipping progress of the

vectors, accompanied by a slow, eerie, piccicato string section. There is then another cut to an operator at work and here the voiceover continues: '[t]he computer can furnish information on the countermeasures available so that the officer in charge can make his choice as to when and where to fight. Once he has selected a plan of counterattack the computer guides interceptors and missiles to the enemy. After an encounter the computer guides the interceptors back to their bases.' In the mind of this viewer at least, the 'projections' which it is claimed the computer is capable of, were easily translated into 'predictions'. As if to confirm this impression of the otherworldly capabilities of this machine, the segment concludes with the voice stating that 'Aladdin's lamp couldn't do more.' Following this segment, the focus of the newsreel shifts from air defence to air offence, and the role of electronic computing is again set out. The uncanny splicing of man and machine is continued in a voiceover announcing that the airborne computer 'has gone into production under the label 'BRANE—bombing, radar, navigation, equipment'. It is equipment moreover, whose intelligent design puts 'testing computer units in the same class as testing light bulbs'. As if to guide the viewer back from the uncanniness of what N. Katherine Hayles has termed 'boundary questions',[34] the newsreel segues to images of a woman fitting a light bulb—an action which once complete, reveals the angelic form of her peaceful, sleeping daughter.[35] But, keeping faith with Pynchon's Byron-the-Bulb, can we read this conclusion against the grain and ask whether this very connection, intended to render all things safe and homely, is equally capable of rendering the light cast on young sleeping faces, unhomely; and given that we cannot finally resolve the matter one way or another, admit the possibility of a future filled with unsettling dreams?

In further pursuit of the unacknowledged nightmares that attend otherwise luminous, official images, I would like to consider one further piece of media, this time a simple image. A further motivation for considering this image is that, as illuminating as the material considered thus far has been, it has been produced for the public, not by the public, and thus leaves the question of the complete infiltration of public discourse by the Rocket somewhat unresolved.

This is not so in the case of a photograph, taken in 1958, of an attractive young woman named Fran Frost, standing next to a scaled replica of a Bomarc interceptor missile. Frost was a client of a hairdresser in the town of Layton, Utah. The hairdresser, Audrene Yates, had recently won a county-wide hairstyling contest which qualified her to enter the state competition. Yates, whose husband worked as a maintenance engineer in neighbouring Ogden for Air Logistics at Hill Air Force Base, the prime maintenance and

supply depot for the defence system of which the Bomarc missile was a part, chose Frost as her model for the next stage of the competition. It was the wife of an officer at the airbase who designed the 'form fitting [black] dress', and Frost in an interview with blogger Bill Geerhart has said that 'the idea of the whole package was to "mimic the missile's dark body and light nose cone"'. Geerhart writes that 'the Air Force periodical *AMC Worldwide...* described the model in a 1958 article as a "Blonde native missile" with a "facile frame"'. The Hill Air Force Base's newspaper, the *Hill Top Times* also provided commentary that Geerhart quotes in his blog, and which I reproduce here:

> This guided missile hairstyle was inspired by the supersonic Bomarc missile. It's a swirl-a-wave which features supersonic action from nape to crown. From a siren list, it cruises to a froth of fluff swinging from cheek to tip of ear. The nuclear payload goes into super action and long-range swirls intercepted by flowing lines and high altitude sweeps cruising towards its target of pixie bangs on the brow.

Audrene won the state-wide competition, and the picture being referred to was taken after the public relations department of the Marquardt Aircraft Company, the manufacturers of the Bomarc's ramjet, took notice.[36]

It is difficult to resist connecting Frost's 'form-fitting' dress with Margherita Erdmann's 'exotic, black Imipolex G costume'.[37] One can only speculate as to whether Pynchon had himself encountered this image, and whether it played any part in the erotic qualities that are associated with the Rocket in his novel. But this of course is all beside the point. The point is that we ought to supplement Justine with Juliet, and add to 'Miss Bomarc' the image produced for the 1975 Picador edition of *Gravity's Rainbow* by illustrator John Holmes—an image which shows a scantily clad female midriff (black panties and suspendered black stockings) whose entire upper body is in the tapered phallic form of a missile.[38] We ought to recognise that *Gravity's Rainbow* literalises what in the Miss Bomarc image is still too homely, still too latent—that America's love affair with technology is not as wholesome as some would have us believe; that America really is in love with death. This statement must of course be immediately qualified: America's 'death instinct' is only the culmination of a European culture of destruction, for as Pynchon's Colonel Weissmann's says: 'America was a gift from the invisible powers, a way of returning' to 'savage innocences', and we are now 'in the last phase [in which] American Death has come to occupy Europe'.[39]

"Post-A4 Humanity": Cybernetic Subjects in *Gravity's Rainbow* and its Authorial Context

In this section I will extend my enquiry into the presence of closed-world discourse in American culture to the particular manner in which these discursive practises function to (reconstitute) human subjects as cyborgs.[40] Following this I will explore the connection between cyborgs and paranoia in *Gravity's Rainbow* and its liberal context. I will then attempt to demonstrate how these themes extend beyond the pages of *Gravity's Rainbow* and concern the novel's reader, regardless of context. Finally, I attempt to ameliorate my own conclusions regarding the Rocket's aggregating force with a cautiously hopeful reading of the novel's ending.

Paul Edwards has written that both 'the engineering and the politics of closed-world discourse centred around problems of human-machine integration',[41] so that at the level of the individual, closed-world discourse correlates with 'cyborg discourse'.[42] He then goes on to summarise this interrelation as follows: '[c]yborg discourse is the discourse of human automata: of cybernetic organisms for whom the human/machine boundary has been erased. Closed-world discourse represents the form of politics for such beings: a politics of the theorization and control of systems'.[43] As important as this description of the reciprocity between the local and the global—between an individual and its technical environment—is, I believe that a further clarification of terminology will be indispensable for the argument that follows.

The use of the term 'cyborg' by Edwards is consonant with ordinary usage and carries the following sense: '[a] person whose physical tolerances or capabilities are extended beyond normal human limitations by a machine or other external agency that modifies the body's functioning; an integrated man–machine system'.[44] This definition does not however retain the sense attributed to the term 'cybernetic'—recall that a cyborg is a 'cybernetic organism'—by the man who originally coined the term. For Norbert Wiener, cybernetics was precisely concerned with those machines, organisms or systems that are self-regulating.[45] With this in mind it is easy to see that this everyday use of 'cyborg' does nothing to distinguish this term from related terms such as 'android' or 'automaton'. The word 'automaton' denotes '[a] moving device having a concealed mechanism, so it appears to operate spontaneously' and originally referred to 'various functional instruments including clocks, watches, etc., as well as moving mechanical devices made in imitation of human beings,'[46] while 'android' simply refers to '[a]n automaton resembling a human being'.[47]

Otto Mayr has written about the cultural and political significance of the difference between the automaton and the self-regulating mechanical device, and has demonstrated how the clock (an automaton) became an ideal symbol of the autocratic systems of government that characterised continental Europe, while self-regulating mechanical devices (such as the steam-engine governor) provided an appropriate metaphor for the ideals of liberal humanism in England.[48] Given this early association between liberal humanism and cybernetic (self-regulating or feedback) devices, one ought to be puzzled by Timothy Melley's statement that '[c]ybernetics... mounted an early and influential challenge to liberal conceptions of human agency'.[49] Melley's statement is very likely influenced by the work of N. Katherine Hayles who has demonstrated that this challenge operated within the cybernetics movement itself, particularly in relation to Wiener who envisioned 'powerful new ways to equate humans and machines' yet 'also spoke up strongly for liberal humanist values'.[50] For her part Hayles acknowledges Mayr's work regarding the historical and structural similitude between cybernetics and liberalism, yet concludes that the confluence of 'liberal humanism, self-regulating machinery, and possessive individualism... [which] helped to create the cyborg...also undermined the foundations of liberal subjectivity'.[51] This tension is strange insofar as cybernetic mechanisms seem to embody liberal humanism's ideals of a constitutional government that is supposed to have 'the ability to maintain its own equilibrium by virtue of a certain institutionalised mechanism'.[52] I think we can begin to untangle these contradictions by offering a few definitional refinements, refinements that have a direct bearing on the status of the subject in *Gravity's Rainbow* and its authorial context. By 'android' I mean a figure that is a mixture of human and machine, but which retains the appearance of a human being. By 'cyborg' I mean an android which is also (supposed to be) self-regulating. By 'automaton' I mean an android that is not self-regulating, that is programmed to run like a clock: a humanoid machine that has the mere appearance of autonomy, but which is in fact merely automatous. It is precisely because the cyborg is, at least in part, an (industrially) manufactured being, that however autonomous it is in practice, it will nonetheless always retain associations of unfreedom. This figure haunts the liberal imagination because in regarding it, one cannot be free of the suspicion that the cyborg may in fact be an automaton, a figure whose actions are entirely programmed; a creature that does not respond autonomously to its environment but receives its instructions from some other, external, authority. But I believe that there is another, deeper reason why the cyborg remains such an unsettling figure. However self-regulating the cyborg is in practice, its androidal status means

that it is never autopoetic in its origins, and is never completely discrete and autonomous in its operation insofar as the process of negative feedback (the precise mechanism of self-regulation) always involves an entire system of communications of which the cyborg is merely a node. But it is precisely these features that are occluded by the American liberal tradition, for here we find an ideology that produces and sustains a subject that is defined by its discrete individuation and autonomy, by social, political and economic ideals of autopoesis.[53] Cybernetics can therefore be seen to give the lie to liberal humanist ideals: where cyborg discourse, as Edwards argues, clearly involves the integration of an individual into a complex system of informatic feedback in which it is produced as much as producing, liberal humanism forecloses this facet of its own subject producing operations lest integration slide towards aggregation—and subjugation.[54] In short the cyborg—to borrow a phrase from William S. Burroughs—is liberal humanism's naked lunch.

These tensions and their aporias are all wonderfully teased out by Timothy Melley's study of the paranoiac structures of conspiracy culture in the United States. For Melley, 'the postwar model of conspiracy is dependent upon a notion of diminished human agency,'[55] and is an unconscious acting out of 'liberalism, and its vision of an autonomous self beleaguered by society'.[56] Melley uses the term 'agency panic' to describe this positioning of the liberal subject.[57] To see how 'agency panic' relates to liberalism's occlusion of subject production, consider Melley's statement that '[a]gency panic reveals the way social communications affect identity and agency, but it also *disavows* this revelation,'[58] while his statement regarding the conspiratorial stance, that 'the real threat is not so much a specific agent or group as *a system of communications*, an organized array of ideas, discourses, and techniques,'[59] reveals the operation of informatic feedback and ideological interpellation in its paranoid aspect.[60] Furthermore, this fact is part of a broader ideological matrix in which '[c]onspiracy theory, paranoia and anxiety about human agency... are all part of the paradox in which a supposedly individualist culture conserves its individualism by continually imagining it to be in imminent peril'.[61] The merely apparent nature of this paradox is revealed when Melley later writes that 'by making diverse social and technological systems enemies of "the self," the conspiratorial views function less as a defense of some clear political position than as a defense of individualism, abstractly conceived'.[62] Thus for Melley, paranoia is the means by which the contradictions of a liberal society are in fact utilised in a manner that serves to perpetuate its social norms; paranoia is thus a regulative mechanism, and there is therefore something eminently cybernetic about paranoia in a liberal context. I will now again turn to the media previously

examined, and consider them in light of this exploration of cybernetics and paranoia.

While *For a Continental Defense* does not evoke the figure of the cyborg directly—which must rather exist by implication, a node in the closed-world vision of a defence system of global reach—*Night Fighters Over New York* provides a distinct picture of humans augmented by their technology, an informatic prosthetics that not only mediates the relation between individuals and their environments, but the relation between these individuals as well. And it is when the task of information processing becomes prominent—as it does in the IBM newsreel showcasing the AN/FSQ-7 computer—that the figure of the cyborg particularly comes to the fore. Thus, the SAGE centre operators depicted in this particular piece of media are humans spliced with electronic computer intelligence, resulting in a new cybernetic organism. The segue that occurs in the newsreel, from computer units to light bulbs, drawing a direct connection between this pre-eminently closed-world machine and the domestic scene, wires the American family, turning them into cyborgs. It is furthermore a transformation that is effected, not by any direct machinic connection with the computer, and through it the Rocket, but through a paranoiac relation in which the Rocket is simultaneously constituted as both violent threat and protective shield (as counterstrike weapons meant to dissuade any first-strike, or as anti-missile missile interceptors—however speculative—intended to protect against incoming missile attack). Both the article and the newsreel enact what Melley has described as cybernetic discourse's double movement of an 'exhilarating prosthetic extension of the person into other systems and the frightening effacement of the liberal subject'.[63] The photograph of Fran Frost repeats this movement of attraction and repulsion in explicitly libidinal fashion, as too of course do numerous examples within the text of *Gravity's Rainbow*. All of these examples repeat the anxiety provoked by the cyborg: we assume that these augmented individuals, these androids, are indeed cybernetic, because this is the ordinary assumption we make about people—that they are self-regulating, autonomous beings. But their androidal aspect, their intimate connection with technology, imaginative or literal, troubles this assumption, and makes us suspect that they may merely be automatons, thereby undermining their agential status.

Seen in the terms described above, cybernetic thinking could easily be regarded as *Gravity's Rainbow's* reigning discursive mode. To begin with, there exists a correspondence between falling rockets, and the novel's protagonist, Tyrone Slothrop's erections, such that there is an exact match

between the place of Slothrop's sexual encounters (which he has marked with stars on a map of London), and the place of descent of V2 rockets. It is true of course that the text later produces details that cast doubt on the veracity of these correspondences: in particular the suggestion that Slothrop fabricated or distorted details relating to the girls who corresponded to the stars pinned to his map of London.[64] This doubt is ameliorated somewhat by details that emerge in chapter one of *In the Zone*, details that connect Laszlo Jamf to Lyle Bland, and thereby to Slothrop's own family. Reading the details that reveal him to be the 'Schwarzknabe' at the centre of so many overlapping corporate interests, Slothrop is overwhelmed by nausea and vertigo, and gets a hardon. This is accompanied by 'a smell from before his conscious memory begins, a soft and chemical smell…'.[65] And,'[h]e knows what the smell has to be... back here in the warm dark, among early shapes where the clocks and calendars don't mean too much, he knows that what's haunting him now will prove to be the smell of Imipolex G'—Imipolex G being the fictional plastic material from which the Schwarzgerät is manufactured, a device which is in turn intimately associated with the 00000 rocket.[66] Even this certainty is however, in true Pynchon fashion, given reason for doubt: the papers in Slothrop's possession indicate that it would have been 'too early' for the smell to have been Imipolex (the plastic was only developed in 1939 by Jamf, well after Slothrop's infancy.)

But this dialectic of fact and counter-fact is an artful distraction that makes the reader of the novel perform the sense of this unresolved and intricate plotting—even as it escapes their notice. For whether or not Slothrop has some mysteriously libidinal connection to the falling rockets, whether or not he was conditioned with Imipolex G in his infancy—all of this pales in importance when compared with the undeniable fact that Slothrop possesses a powerful psychological connection to the Rocket. It is early in the book that we learn that he 'has become obsessed with the idea of a rocket with his name written on it'.[67] It is in the same place that we witness the Rocket's substitutability with 'the Word' and learn of the Slothrop family's peculiar 'sensitivity to what is revealed in the sky'. Slothrop's ancestor, Constant 'saw, and not only with his heart, that stone hand [of God] pointing out of the secular clouds, pointing directly at him'.[68] We can see how at a formal level, Constant's vision repeats the double movement that characterises the paranoid cyborg discourse identified by Melley: the direct connection with God is fundamentally ambiguous, for the identification may entail either the glorification or the effacement of the individual. One of the great achievements of *Gravity's Rainbow* however is to dramatise Slothrop's experience for the reader through the act of reading itself, since the reader's

pursuit of meaning in the text makes them miss that meaning even as they are producing it—generating it metatextually. The meaning in question is thus the search for meaning itself. It is in this way that the Rocket comes to occupy the place of God (as Word, as Text) in Slothrop's and the reader's imaginative universe—a substitution that does not secularise God, but instead, deifies the Rocket, rendering it the lynchpin for an entire universe of meaning.

It is for this reason that the image of Gottfried's entombment in the Schwarzgerät, an insulation device attached to the 00000 rocket fired by Colonel Weissmann on the Lüneberg Heath, confirms like no other the figure of the cyborg as an instantiation at the local level of a closed-world discourse, an image that Weisenburger has characterised as 'machine incorporating man'.[69] But in light of the foregoing discussion, this image of the incorporation of man with machine necessarily entails the incorporation of man into the meaning constituted by the Rocket, transitioning us back to the global discourse of a closed-world. It would therefore be a fair conclusion to regard the prime role of the Rocket in *Gravity's Rainbow*, whether directly or indirectly, as orienting individuals and groups of individuals in their various quests for knowledge and meaning—knowledge and meaning that will, whatever the communitarian component of their projects, help them to establish or consolidate their status as individuals. The following is only a short list of characters and their quests in *Gravity's Rainbow*: Slothrop's quest to understand his origins is a quest to find the Rocket; for Weissmann, the Rocket constitutes the central object in an obscure and resurrected German Romanticism; Enzian uses the Rocket in a similar fashion to Weissmann, as a totem to unify and orient the cultural remains of the Herero people; Tchitcherine, like Slothrop, obsessed with uncovering his family origins, pursues the Rocket by pursuing his half-brother Enzian; Pointsman is similarly obsessed with his life's purpose or meaning, an obsession that is concentrated in his attempt to explicate Slothrop's sexual anomalies by means of Pavlovian theories of conditioned reflex. Alain Badiou, evoking Jacques Lacan, has noted that 'if you consign what happens to sense or meaning, you work towards the subjective consolidation of religion'.[70] Pynchon himself affirms this insight precisely when he writes that 'the Rocket has to be many things, it must answer to a number of different shapes in the dreams of those who touch it'.[71] In her work, *Ideas of Order in the Novels of Thomas Pynchon*, Molly Hite argues that the Rocket's arc, tracing the journey from launch to termination, becomes a metaphor for the way *Gravity's Rainbow* seductively presents the possibility of a totalizing, providential history, with clear beginning, middle and end.[72] It is by way of these insights

that we should again evoke that German name for the Rocket, the 'Aggregat': it is an aggregate, a 'complex whole, mass, or body formed by the union of numerous units or particles'. The Rocket is that which counts all that exists within the fictional (and closed) world of *Gravity's Rainbow*—submitting it to its law of consistency and allocation. It is in this way that it aggregates, providing as Pynchon's character Oberst Enzian expresses it, a 'sense for the statistics of our being'.[73] And it is thus furthermore, as the narrator of *Gravity's Rainbow* notes towards the end of the book, 'any System'—the Church of Rome being but one example—'which cannot tolerate heresy..'.[74]

Dale Carter has noted how '[o]n the one hand, the point at which the rocket touches the roof of the Orpheus Theater is... the apotheosis of the post-war integration of history and autobiography inaugurated by the flight of the 00000', while 'on the other hand this 'last unmeasurable gap' is also the terminus of the process... where "the last delta-t" completes the integration process and with it the Rocket-State's cycle.' Furthermore for Carter, the audience, as 'members of the post-war state... are first directed within and then sacrificed to a power structure they themselves have helped to establish'.[75] But what Carter has termed 'the universal enclosure of the Orpheus Theater, Pynchon's *Theatrum Mundi*',[76] is even more inclusive than he asserts, for its acts of inclusion are not merely historical, but formal as well; formal acts performed at the level of reading *Gravity's Rainbow* itself. The act of reading, the pursuit of meaning by the reader in the text, doubles the narrative action of the novel, with the implication that the reader's own subjective consistency is reproduced in the book's (and thus the Rocket's) own terms. We are rendered indistinguishable from every other paranoiac within the novel; rendered so by a regulative act of informatic feedback that is the very act of reading itself.[77] From the perspective of *Gravity's Rainbow*, our destiny as subjects is a kind of entombment quite indistinguishable from the entombment of a boy whose name means 'God's peace' in the S-Gerät attached to the 00000 rocket, an entombment that performs an ironic binding through the Rocket to a fullness of meaning that can only ever be God's; a binding that is also—given the historical nature of this particular God—a binding to death.[78]

But such a death, a death brought about by total thermonuclear war, is, as Daniel Grausum has argued, unwitnessable, and therefore impossible to narrate insofar as all narratives must by their very nature entail endings.[79] And *Gravity's Rainbow* does in fact not narrate any such ending, only its approach—the approach of the Rocket as it 'reaches its last unmeasurable gap above the roof of this old theatre, the last delta-t'.[80] But is the novel's

omission of an ending merely attributable to the impossibility of narrating such an end? Must we accept Grausum's assertion that 'Postmodernist fiction is... the literary symptom of new understandings of space and time produced by the nuclear age with which it coincided', or that 'aesthetic innovation' more generally 'can be seen as symptomatic of larger historical pressures'?[81] The former claim is the stronger of the two, and one that I do not accept, whereas—as my own reading of *Gravity's Rainbow* attests—the latter assertion is one that I absolutely do accept: the novel is deeply engaged with its own historical moment, and is an expression/symptom of the broader social concerns of that moment. But it also actively addresses itself to that moment, and is not merely a symptom. The closing section of the novel, 'DESCENT', presents an essential ambiguity that sustains this point, for there is a contradiction in the phrase 'last unmeasurable gap' insofar as 'last' is quite unambiguously an indication of measure, the unambiguous designation of a limit, whereas 'unmeasurable' denies any notion of limit. Of course, seen from the point of view of the calculus, there is no contradiction: there is both a limit and an endless, unmeasurable, approach. But seen otherwise, there is a tension, political and cultural, one that has already played itself out elsewhere in the novel, between Leni and Franz Pökler. For Leni, '[t]here is the moment and its possibilities', possibilities precisely sustained by the infinity of approach. For Franz on the other hand, 'the important thing is taking a function to its limit'.[82] However pessimistic the novel's end, however ironic the phrase '[t]here is time' in the final section, the fact remains that there is time, time to consider the moment and its possibilities—time to consider the possibility of some secret integration.[83] In contrast to Grausum, I believe that the Rocket's real significance resides less in the possibility of (unrepresentable) total thermonuclear war, than in the cultural and political realities that made such a war seem at various times inevitable.

To see how this might be the case, it helps to consider Pynchon's story, "The Secret Integration" (1964), whose references to the film "Spartacus" (1960) anticipate the references to the defeated slave revolt of 71BC, and the failed political uprising of the Spartacus League of pre-Hitler Germany in *Gravity's Rainbow*. Furthermore, the story's play on the word 'integration' doubles its mathematical sense in the calculus with the political sense of integration as embodied in the landmark decision of *Brown vs. Board of Education* (1954).[84] With this in mind, and recalling the place that (we) the audience occupy in the novel's closing moments—'the Orpheus Theatre'—I believe that *Gravity's Rainbow* presents its reader with a decision. Do we, like Orpheus, turn back and sacrifice the moment and its possibilities, thereby repeating Franz Pökler's 'death-wish' and 'Rocket-mysticism',[85] or

do we commit ourselves to Leni's hope, and Grover's interpretation of the calculus in "The Secret Integration", that the moment 'never gets solid', that one can always 'get free'?[86]

The aggregating force of *Gravity Rainbow's* Rocket is as supple as it is extensive and reaches beyond the pages of the novel to its authorial context, as well as to the novel's reader regardless of context. As consequence of this, any attempt to consider the possibility of some exception to this force must be carried out both formally and contextually. My own attempt has been limited to maintaining that at the formal level, the novel precludes any final assessment of its own, thereby presenting its reader with a decision, a decision that can perhaps only take the form of a wager. Whether the novel's context can inform this decision or force it to take the form of a wager must await further research.

End notes

1. Leo Bersani, "Pynchon, Paranoia, and Literature," in *Thomas Pynchon*, ed. Harold Bloom, Bloom's Modern Critical Views, 2003, 153; Mark R. Siegel, "Creative Paranoia: Understanding the System of Gravity's Rainbow," *Critique* 18, no. 3 (March 1977): 45.

2. "Aggregate, N. and Adj.," *OED Online.* (Oxford University Press, September 2012), <http://www.oed.com/view/Entry/3932?rskey=elUZx1&result=1&isAdvanced=false>.

3. I here adopt Pynchon's practice of capitalising "the Rocket" insofar as this word stands for the rocket as organising symbol for a whole system of technical and political control.

4. Steven Belletto, *No Accident, Comrade: Chance and Design in Cold War American Narratives* (Oxford [UK]; New York: Oxford University Press, 2012), 12. Belletto argues that 'when language itself is interrogated in ways that turn on questions of freedom and control, we can call this political engagement'. Belletto supports this assertion by noting the manner in which politics in the Cold War was often viewed as fiction, with the implication that 'literary fiction making became laden with political significance'. While I absolutely agree with Belletto that language (or rather, discourse, insofar as this term emphasises the manner in which various cultural practises that are not obviously linguistic can embody ideological value) does shape reality with 'consequences for the ways that power could either subjugate or ennoble people', I do not accept that the mere interrogation of language can be regarded as political engagement. On the contrary, while literary fiction or criticism may address itself to subject matter that is political in nature, and

even produce insights that are of political value, it is only direct engagement (of a radical liberatory nature) that is ever truly political or worthy of the name politics.

5. Dale Carter, *The Final Frontier: The Rise and Fall of the American Rocket-State* (London; New York: Verso, 1988).

6. Thomas Pynchon, *Gravity's Rainbow* (Picador, 1975), 694.

7. Ibid., 753.

8. The Bomarc B, whose first successful test flight took place in 1960, was equipped with a W-40 nuclear warhead, which was however intended for purely defensive purposes: to intercept long-distance bomber planes. See Andreas Parsch, "Bomarc," *Encyclopedia Astronautica*, accessed October 3, 2013, http://www.astronautix.com/lvs/bomarc.htm.

9. "Nuclear Weapon.," *Encyclopædia Britannica* (Encyclopædia Britannica, Inc., 2013), http://library.eb.com.au/eb/article-9110178.

10. "Rocket and Missile System.," *Encyclopædia Britannica.* (Encyclopædia Britannica, Inc., 2013), <http://www.library.eb.com.au/eb/article-57335>.

11. Adrian Wisnicki, "A Trove of New Works by Thomas Pynchon? Bomarc Service News Rediscovered," *Pynchon Notes*, no. 46–49 (2000): 9–34.

12. Lemelson Center for the Study of Invention and Innovation, "Computer Oral History Collection" (National Museum of American History, 1977), Computer Oral History Collection, http://invention.smithsonian.org/downloads/fa_cohc_abstracts_a-d.pdf.

13. Kenneth Schaffel and Alfred D. Chandler, *The Emerging Shield : The Air Force and the Evolution of Continental Air Defense, 1945-1960*, General Histories (Washington, D.C: Office of Air Force History, United States Air Force, 1991), 117.

14. Parsch, "Bomarc."

15. Steven Weisenburger, "Gravity's Rainbow," in *The Cambridge Companion to Thomas Pynchon*, ed. Inger H. Dalsgaard, Luc Herman, and Brian McHale (Cambridge; New York: Cambridge University Press, 2012), 46.

16. Pynchon, *Gravity's Rainbow*, 304.

17. Paul N. Edwards, *The Closed World: Computers and the Politics of Discourse in Cold War America* (Cambridge, Massachusetts: MIT Press, 1996), 1.

18. Lincoln Laboratory, "The SAGE Air Defense System," accessed September 11, 2012, http://www.ll.mit.edu/about/History/SAGEairdefensesystem.html.

19. Schaffel and Chandler, *The Emerging Shield*, 236; Edwards, *The Closed World*, 104.

20. Neither SAGE nor the BOMARC were ever intended to defend against ICBMs. Indeed the Soviet decision in the late 1950s to concentrate on ICBMs meant that both systems were technologically outdated soon after their first deployment (Schaffel and Chandler, 207, 238.) Of course, technological inefficacy did not diminish their usefulness in sustaining an ideology of technological closure (Edwards, 108–109.)

21. Centre of Military History, *History of Strategic Air and Ballistic Missile Defense, 1945–1955*, vol. 1, Special Studies Series 40-5-1 (U.S. Army, 2009), 33,108, http://www.history.army.mil/html/books/bmd/BMDV1.pdf.

22. Strictly speaking, SAGE was intended for a continental, not a global defense. Its ideological ambitions were more far-reaching than this however, and inspired other SAGE-like systems (the "Big L" systems). The culmination of these ambitions was the Reagan Administration's Strategic Defense Initiative (Edwards, 107, 275.)

23. Carter, *The Final Frontier*, 3.

24. Ibid., 5.

25. Ibid., 234–235.

26. Ibid., 36.

27. Luc Herman and Steven Weisenburger, *Gravity's Rainbow, Domination, and Freedom*, 2013, 4. Herman and Weisenburger are in turn indebted to John McMillian and Jeremy Varon who date this period from 1954 to 1975. See Herman and Weisenburger, page 223, note 5.

28. A shorter version of this article was republished in the *Boston Globe*, *Christian Science Monitor,* and *Bulletin of the Atomic Scientists*.

29. James R. Killian Jr. and A.G. Hill, "For a Continental Defense," *Bulletin of the Atomic Scientists* 10, no. 1 (January 1954): 15.

30. Phil Gustafson, "Night Fighters Over New York," *Saturday Evening Post* 224, no. 31 (February 2, 1952): 32.

31. Ibid., 33.

32. Edwards writes that by 1952 'IBM had signed on to design a production version of Whirlwind, the AN/FSQ-7' SAGE computer (97), and their continuing involvement in the SAGE project was extensive (101).

33. Edwards, *The Closed World*, 104.

34. N. Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics*, 1st ed. (University Of Chicago Press, 1999), 279.

35. Military Products Division IBM Corporation, *On Guard! The Story of SAGE*, 1956, http://archive.org/details/OnGuard1956.

36. Bill Geerhart, "Meet Miss Bomarc," *CONELRAD Adjacent*, January 13, 2011, http://conelrad.blogspot.com.au/2011/01/meet-miss-bomarc.html.

37. *Gravity's Rainbow*, 488.

38. Pynchon, *Gravity's Rainbow*.

39. Ibid., 722.

40. Thomas Pynchon, *Slow Learner* (Vintage/Ebury, 1995), 13; Norbert Wiener, *The Human Use of Human Beings: Cybernetics and Society* (London: Free Association Books, 1989), 15. Pynchon's interest in cybernetics is well documented: in an introduction to his collection of short stories entitled *Slow Learner*, Pynchon cites Norbert Wiener's book *The Human Use of Human Beings* as one of two early influences on his fascination with the theme of control. In this book Wiener explains the concept of cybernetics, whose name he derived from the Greek word for 'steersman', and which he envisioned as being a science of control in human and machine. Control is a principle of order in Wiener's terms, an anti-entropic principle, and allied in his mind with life considered as a principle of negentropy. This vision of control and order is realised through Wiener's concept of information feedback, and in particular, negative information feedback, a process which occurs between humans, machines and their environments.

41. Edwards, *The Closed World*, 1.

42. Ibid., 2.

43. Ibid., 27.

44. "Cyborg, N.," *OED Online* (Oxford University Press), accessed June 13, 2014, http://www.oed.com.ezp.lib.unimelb.edu.au/view/Entry/46487.

45. Wiener, *The Human Use of Human Beings*, 33, 24–25. While Wiener does not himself use the term 'self-regulation,' (negative) feedback, which Wiener describes as 'the property of being able to adjust future conduct by past performance', and which is a self-reflexive mechanism of control, is the necessary requirement for the 'stability of performance' of any machine or organism. For a discussion of the manner in which negative feedback enables actions of increasing complexity in animal or machine, see Arturo

Rosenblueth, Norbert Wiener, and Julian Bigelow, "Behavior, Purpose and Teleology," *Philosophy of Science*, no. 1 (1943): 18.

46. "Automaton, N.," *OED Online* (Oxford University Press), accessed June 13, 2014, http://www.oed.com.ezp.lib.unimelb.edu.au/view/Entry/13474.

47. "Android, N.," *OED Online* (Oxford University Press), accessed June 13, 2014, http://www.oed.com.ezp.lib.unimelb.edu.au/view/Entry/7333.

48. Otto Mayr, *Authority, Liberty, & Automatic Machinery in Early Modern Europe*, Johns Hopkins Studies in the History of Technology (Baltimore: Johns Hopkins University Press, 1986).

49. *Empire of Conspiracy: The Culture of Paranoia in Postwar America* (Ithaca, N.Y.: Cornell University Press, 2000), 38.

50. Hayles, *How We Became Posthuman*, 85.

51. Ibid., 86.

52. Mayr, *Authority, Liberty, & Automatic Machinery in Early Modern Europe*, 163.

53. Drawing on the work of Philip K. Dick and C.B. Macpherson, Hayles makes a similar point when she writes that '[i]f owning oneself was a constitutive premise for liberal humanism, the cyborg complicated that premise by its figuring of a rational subject who is always already constituted by the forces of capitalist markets' (*How We Became Posthuman*, 86–87.)

54. It is not that there is no connection between the individual and its social, political, or economic environment in liberal discourse. Nonetheless liberalism clearly favours a description in which the action of individual agents produces the social or political system rather than recognising the manner in which these agents are themselves produced.

55. *Empire of Conspiracy*, 3.

56. Ibid., 11.

57. Ibid., 12.

58. Ibid., 14–15. Emphasis in the original

59. Ibid., 2. Emphasis in the original.

60. Louis Althusser, "Ideology and Ideological State Apparatuses," in *Lenin and Philosophy, and Other Essays*, trans. Ben Brewster (Monthly Review Press, 1971), 127–88. With regard to the term 'interpellation', Althusser writes that "ideology 'acts' or 'functions' in such a way that it 'recruits' subjects among the individuals (it recruits them all), or 'transforms' the individuals into subjects (it transforms them all) by that very precise

operation which I have called interpellation or hailing, and which can be imagined along the lines of the most commonplace everyday police (or other) hailing : 'Hey, you there !'" (174).

61. Melley, *Empire of Conspiracy*, 6.

62. Ibid., 11.

63. Ibid., 88.

64. Pynchon, *Gravity's Rainbow*, 302.

65. Ibid., 285.

66. Ibid., 286.

67. Ibid., 25.

68. Ibid., 26.

69. Weisenburger, "Gravity's Rainbow," 53.

70. Alain Badiou, *Logics of Worlds*, First Edition (Continuum Publishing Group, 2008), 387.

71. Pynchon, *Gravity's Rainbow*, 727.

72. Molly Hite, *Ideas of Order in the Novels of Thomas Pynchon* (Columbus : Ohio State University Press, 1983), 11, 98.

73. Pynchon, *Gravity's Rainbow*, 362.

74. Ibid., 747.

75. Carter, *The Final Frontier*, 72–73.

76. Ibid., 74.

77. Hite, *Ideas of Order in the Novels of Thomas Pynchon*, 9. Molly Hite has pointed out how the novel is filled with 'critical characters' whose interpretive action within the novel make them analogues for the reader of the novel. This correspondence is important to note, since the characters are generally, according to Hite, a bunch of 'schlemiels' when it comes to deciphering the action of the novel, and so the reader is tricked into filling the gaps left in their interpretations, and thereby themselves foisting a regime of totalising meaning upon the text.

78. Belletto, *No Accident, Comrade*, 49. Steven Belletto's gloss of Hannah Arendt's statement that '"[t]otalitarian propaganda thrives on this escape from reality into fiction, from coincidence into consistency"' as emphasising 'the narrative quality of totalitarianism' is useful for understanding the significance of the reader's complicity in meaning making in *Gravity's Rainbow*: we are all in the shadow of Colonel Weissman; all on the brink of becoming little fascists.

79. Daniel Grausam, *On Endings: American Postmodern Fiction and the Cold War* (University of Virginia Press, 2011), 5.

80. *Gravity's Rainbow*, 760.

81. Grausam, *On Endings*, 5, 7.

82. Pynchon, *Gravity's Rainbow*, 159.

83. Lance W. Ozier, "The Calculus of Transformation: More Mathematical Imagery in Gravity's Rainbow," *Twentieth Century Literature* 21, no. 2 (May 1975): 195, 207. Ozier also regards Leni's political interpretation of the calculus as significant, but unlike Ozier (or Leni for that matter), I do not believe the novel presents the possibility of transcending this world, but rather the possibility of its radical transformation.

84. Pynchon, *Slow Learner*, 155; *Gravity's Rainbow*, 155.

85. Pynchon, *Gravity's Rainbow*, 154.

86. *Slow Learner*, 186–187. I am under no illusions that *The Secret Integration* is without ironies of its own: the boys use the story's African American character, Carl: '[he] was entirely theirs, their friend and robot, to cherish... or even... to banish from their sight' (192). They are in a word, both naive and treacherous. But this does nothing to undermine the purity of the hope that they serve to express.

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