



Research Article

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“Cinematic” Gravity’s Rainbow: Indiscernibility of the Actual and the Virtual

“There are worse foundations than film” (Pynchon 388).

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Abstract: Acknowledging that all media interpenetrate without any one being privileged as original, this paper focuses on the influence and omnipresence of screen technologies, cinematography in particular, asserting its capacities to act as a dominant technological and cultural force, which surveys and controls the economy, affects human consciousness, and implements its own ideologically tainted reality. More specifically, the analysis demonstrates the impact of cinematography within Thomas Pynchon’s *Gravity’s Rainbow*, emphasizing intermedial reflexivity from screen to paper, its unfolding and animation, representations and mutations, but also the notion that virtuality dominates actuality (Virilio, *The Vision* 63), or, in Deleuze’s terms, the two coalesce within the crystal-image, for the real and the imaginary, the actual and the virtual, although distinct, are indiscernible (Deleuze, *Cinema 2* 68-69). The study is grounded in Paul Virilio’s theoretical framework and his criticism of the colonization of the real by the virtual, and in Gilles Deleuze’s account on cinematic taxonomy and how cinematography partakes in the emergence of a new notion of reality and history. By appropriating, repurposing, and reshaping the techniques, forms, and contents of cinematography, and at the same time being critical of its effects, Pynchon uses paper surface for transition of his ideas, validating the repercussions of intermediation as a cultural force and unveiling literature’s performativity, its ability to shelter/entertain the “cinematic,” which in turn revolutionizes and animates fiction.

Keywords: Thomas Pynchon, *Gravity’s Rainbow*, cinematography, Gilles Deleuze, Paul Virilio

Introduction: Remediation, Social Control, and Actual-Virtual Tension

This paper focuses on particular mediations from screen to paper, dealing mainly with “cinematic” imprint in Thomas Pynchon’s *Gravity’s Rainbow*; the processes which simulate, incorporate, and modify technologies, conventions, and other features of cinematography, and reposition them within paper-based literature. Many critics have already delved into the novel’s filmic references and its aptitude to be read as a film; among them Scott Simmon, Thomas Moore, Alex McHoul and David Willis, Hanjo Berressem, and John Johnston. Their analyses illustrate how *Gravity’s Rainbow* employs film—both as a thematic composition and as a structuring mechanism—as they interpret various films and filmmakers cited in the novel, stress cultural and aesthetic implications of cinematography, inspect scenes that generate film images, and scrutinize movie-making techniques that Pynchon used, such as musical numbers, camera angles, montage, and lighting.

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My study aims to participate in the analysis of these interactions between cinematography and this particular novel. It tries to acknowledge what happens when fiction draws on film and its *avant-garde* techniques and how these interactions are represented, performed, and criticized. It incorporates Virilio's and Deleuze's ideas on cinematography, illustrating how intrusions of the multifaceted visual (Deleuze's crystalline image that is also a time-image) inform the novel and additionally dissolve the confines between the actual and the virtual, the real and the imaginary. Virilio insists on an anti-media position, criticizing late-capitalist modes of production and consumption because his idea is that technology infringes on the human and its unified natural body, "contaminating the horizon of sight as well as knowledge"—"a rational metaphor for intoxication" (Virilio, *The Vision* 76). Deleuze, on the other hand, considers technology as a part of the collective assemblage with which humans grow and adapt so that the unified natural body is never given but it is always in the process of evolution and change (Deleuze and Guattari, *A Thousand Plateaus* 4).

Pynchon negotiates with both views, delineating what Virilio marks as the domination of the virtual over the real, which together with the military-industrial-entertainment complex destabilizes and de-centers the human and causes the perdition of historical consciousness and continuity, "producing only disorienting, alienating effects, rendering it in turn ever more susceptible to manipulation" (Johnston, "Machinic" 32). The military-industrial-entertainment complex (with the acceleration of temporality—*speed-space*) is the dominating power of the western world (according to Virilio), and it features, in its center, technology whose forces reshape our space-time, coordinating the transformations implemented by electronic communications, long-range atomic weapons systems, cybernetics, media such as television, film, newspapers, and so on. Yet, Pynchon's novel also clearly identifies with Deleuze's idea that "the indiscernibility of the real and the imaginary, or of the present and the past, of the actual and the virtual, is definitely not produced in the head or in the mind, it is the objective characteristic of existing images which are by their nature double" (Deleuze, *Cinema 2* 69). What both philosophers agree upon and Pynchon illustrates is that the boundary between the real and the mediated or imagined has become indistinct.

Furthermore, all three contemporaries acknowledge that new forces of control were instituted after World War II. Foucault's prison, hospital, school, and factory as environments of enclosure are in crisis, while "the ultrarapid forms of free-floating control" emerge in other social spheres (pharmaceuticals, molecular engineering, genetic manipulation), and through the sophisticated technologies assist as mechanisms of control (Deleuze, "Postscript" 4). Thus, the luring powers of cinematography serve as a modulated form of surveillance, whereas subjects lose agency over the object and are reduced to media-saturated spectators, who experience the deprivation of the real and identify with cinematic modes of conduct, prone to accept political and ideological agendas disseminated through the screen.

The theoreticians of postmodern culture have recognized cinema's quintessence in implementing archetypal paradigms of the postmodern condition that serve not only as a carrier of current social, political and economic systems (of Pynchon's "They" who manipulate and survey the masses), but as an aspect of them, "shap[ing] modern consciousness" (Marquez 167). In *Gravity's Rainbow*, Pynchon employs powerful metaphors around cinematography, spotlighting it as a cardinal technological and cultural force, akin to warfare and industrial chemicals, which allows powerful conglomerates, such as film industries, to monitor and direct the economy. Set mostly during World War II, the novel exploits the socio-political context of war, closely linked to commercial profits and to the industry of consumerism. It reveals a unique space-time of commodity, instantaneity and disposability (of human lives too), which is perfectly illustrated through cinematic artistry, drawing on German Expressionism and Hollywood, subtly corroborated by quasi-militaristic language of cinematography, its "shooting," "cut," "action," "framed," and "captured."

Through Pynchon's encyclopedic lens of film references and motion picture history, cinematic techniques and language, the readers understand better the flaws of representation, where history and reality yield to compositional strategies and are taken as a combination of constructed images based on perspective. *Gravity's Rainbow* reinforces randomness, discontinuity, and relativity of the actual world; it inverts and parodies realistic forms of representation and draws attention to the dynamics by which media work—animating, trespassing, conjoining, modifying—which identify them as process-dependent, sustaining qualities of retention of constitutive modalities as well as of their modification. As A. N.

Whitehead explained in his process theory, “[p]rocess is the becoming of experience” (166). Everything becomes moment by moment, with repetition and change playing a crucial role (Deleuze, 1994), so that process is essentially transition to otherness in which something is always retained. This is how media operate in an on-going process of experience, modifying and animating one another in a series of cycles that demands certain repetition of modalities as well as their transformation, functioning as open dynamical systems that imitate the fluctuations of the universe at large. And, this is how Pynchon’s text performs by altering, trespassing, and conjoining film and fiction, the real and the mediated, human intelligence and the technological tools, where recursive patterns, feedback loops, and self-reflexivity are deeply entangled and reinforce constant transitioning and fragmentation of concepts, forms, and meaning.

Gravity’s Rainbow reads like a kaleidoscopic fusion of violent history, conflicting socio-political and economic interests, scientific and metaphysical notions, collective and individual fantasies and dreams, that merges fact and fiction, which are created and supervised by controlling systems of various origins, including film industry, where artificial prefigures the real, implementing psychological manipulation to constitute desired perceptions of reality and history.

Cinematic Techniques: Fragmentation, Simultaneity, and Manipulation

With cinematography’s mobilisation of the snapshot in 1895 or as Virilio refers to it the “*retinal take-off*,” the history of “seeing” was revolutionized with the emphasis on motion, image-manipulation, and animation (Virilio, *The Vision* 3). The etymology of the term *cinematography* implies movement and writing, which in a way means: to bring a story to life visually. The word’s Greek roots already impose narration, testifying of remediation by the “old” practice of inscription, but also of the mobilization of still images, of both Whitehead’s retention and modification. Inscribed in extensive time, cinematography promotes expectation and suspense, familiar in the paper-based literature (Virilio, *The Vision* 72), but, moving images stimulate our senses on a completely different level due to their audiovisual expression, their incorporation of rhythmic and plastic arts. Granting that “the medium is the message” (McLuhan 7), cinema captivates the spectator’s attention, “drawing him into a hypnosis” (Berressem 160), so that s/he is seduced by the framed reality, and thus gives power to a military-industrial-entertainment complex behind the screen, which exercises social surveillance and controls the masses through this omnipresent medium.

Pynchon’s usage of film form, movie-culture and visual conventions serves as a literary framework. As Scott Simmon notes “[t]he complexity of *Gravity’s Rainbow*’s film-form comes from Pynchon’s awareness that our whole way of approaching narrative itself has been altered by film” (127). Indeed, the author utilizes film techniques and terminology as an intertextual literary device, re-conceptualizing the way we perceive the novel as a genre, reminiscent of Joyce’s and Dos Passos’s methods. These arrangements come in the form of camera movements and angles, close-ups, insert shots, analeptic montages, disjunctive editing, and various other cinematic methods, such as expressive *mise-en-scène* and chiaroscuro lighting, tied to German Expressionism and perfectly fitting within Pynchon’s war-stricken Europe. What these captured still frames/images and their visual sequence unravel is fragmentation, even though Pynchon’s circulating tropes try to “mak[e] the unreal reel” (Pynchon 689), aspiring to (modernistic) wholeness. Yet, the contents of the reel are not real for image is a construct, dissolving in (postmodern) fragmentation, with fleeting characters and events that emerge and then evaporate, abruptly shifting from topic to topic, which results in random collages of actions and discourses that occur and reoccur. Apart from cinematic techniques, the author uses the stream of consciousness technique and is constantly moving between concerns, fragmenting the narrative by startling juxtaposition and rapid cutting, thus conveying complex, simultaneous phenomena, putting “the actual image beside a kind of immediate, symmetrical, consecutive or even simultaneous double” (Deleuze, *Cinema* 2 68).

A perfect example of Pynchon’s employment of cinematic techniques which underlines how the medium changes the viewers’ perspective of images caught on screen and is an agency of control is transparent in Webley Silvernail’s experience of the behaviorists’ rat lab: “From overhead, from a German

camera-angle, it occurs to Webley Silvernail, this lab here is also a maze” (Pynchon 229). The high-angle shot draws attention to how camera movement transforms the plane of focus and the subject’s final image so that Silvernail sees rats and mice engaged in a labyrinth of confusing networks which eventually “form into the shape of a single giant mouse” (Pynchon 230), that underlines the manipulative qualities of the screen and his/our inability to distinguish reality from the virtual. This also stresses the vulnerability of the exposed subjects who are powerless under the objective—framed, which Pynchon ties to German rocket’s view “[f]rom overhead” and its arresting representation of power and death.

With Silvernail’s further musing on “who watches from above, who notes *their* responses?” (Pynchon 229), Pynchon seems to agree with Virilio in acknowledging that modern vision is the product of the military-industrial-entertainment complex, tightly correlated to cinematic technologies of disappearance, and implies, as Virilio noted that “[w]e are all being controlled through our machines” (Virilio, “The Information Bomb” 100). Silvernail concludes that there is slight hope that “They” would ever “lose Their technology’s elaborate terror, and stop using every other form of life without mercy” (Pynchon 230). Monopolized by the profit motive, the military-industrial-entertainment complex uses every form of life to increase its power and revenues. It administers models of behaviour upon which subjects construct their identity, serving them/us with all sorts of sophisticated propaganda through screen technologies to cultivate consumption for “the real business of the War is buying and selling”; death is only a spectacle-like distraction from trading crafts and investment operations (Pynchon 105).

Intermediation: Screen or Page— Deleuze’s “Any-Space-Whatever”

It is almost impossible to distinguish between the cinematic/mediated and the real (actual textual world of the characters) in *Gravity’s Rainbow*. The author intertwines the characters’ physical surrounding with the world as projected by the media. The novel opens with Prentice’s dream that is like a movie and closes with crowds watching a movie in the theatre, giving a possibility that all the events have happened on the screen (Heise 181). The work’s form signals filmmaking techniques for “[t]he dramatization of the narrative as a movie is most conspicuous in the text’s demarcation of chapter-like sections by rows of little quadrangles resembling film sprocket holes” (Caviola 106). Even Pynchon’s narrator seems unable to distinguish between the space of the movie house and the space projected on the screen at the end of the novel:

[t]he screen is a dim page spread before us, white and silent. The film has broken, or a projector bulb has burned out. It was difficult even for us, old fans who’ve always been at the movies (haven’t we?) to tell which before the darkness swept in. . . . And in the darkening and awful expanse of screen something has kept on, a film we have not learned to see . . . it is now a closeup of the face, a face we all know— (Pynchon 760)

Here we observe intermediation at work where the screen becomes a page and the page a screen, since “the boundaries of all kinds have become permeable to the supposed other” (Hayles, *My Mother* 242). Pynchon displays how dynamic systems work through continuous interactions and constant feedback loops, underlining amalgamation of the two mediums and human vulnerability to overload of moving images. To unsettle this dynamic hierarchy further, the author discontinues the projection, the viewers/readers sit in the murkiness and face “this dark and silent frame” (Pynchon 760), a blank screen/page, trying to figure out the historical and/or fictive tidings—the projections of the medium and their own realities.

This scene corresponds perfectly with Deleuze’s classification of cinematic images, bearing in mind that Deleuze published his *Cinema 1* (1983) and *Cinema 2* (1985) a decade after *Gravity’s Rainbow* came out. The composition consists of “affection-images” (Deleuze, *Cinema 1* 88), underlined by the “closeup of the face” and “the darkening and awful expanse of screen”; it sets a mood of alteration that images are exposed to while generating features for the emergence of new images. It represents a world in process, the everlasting transition and movement of objects in the world (Deleuze’s movement-images). This setting (that we must remember is the ending of the novel) is representative of the aspect Deleuze names “any-space-whatever” (Deleuze, *Cinema 1* 110), with white screen and dim page attributes, the play of shadows,

caliginosity, and emptiness, offering “a pure potential” (Deleuze, *Cinema 1* 120), inherent in the remark that “[t]here is time” (Pynchon 760).

These bodies, objects, and the location are affected by two dominant qualities—that of darkness and opacity—which is also the expression of how affection-images can exercise power, “grasped as pure locus of the possible. What in fact manifests the instability, the heterogeneity, the absence of link of such a space, is the richness in potentials or singularities which are, as it were, . . . prior conditions of all actualization, all determination” (Deleuze, *Cinema 1* 109). Deleuze’s “any-space-whatever” with no-coordinates, disconnected or emptied, abounds in virtual potentials not yet actualised, “where the modern affects of fear, detachment, but also freshness, extreme speed and interminable waiting” are developing (Deleuze, *Cinema 1* 121). Likewise, the last scene in *Gravity’s Rainbow* captures the speed with which events evolve and the immediacy of images that dis/appear, and thus, the inability of “any eye to register” (Pynchon 760) what is going on the screen. The equipment breaks and the impatient spectators are waiting for the show to start, as the readers anticipate the rocket to hit the theatre, revealing an atmosphere of unease, fear, and disconnection, but also its “richness in potential or singularities” (Deleuze, *Cinema 1* 109).

Both Pynchon and Deleuze illustrate the shift of human consciousness at the close of WWII, where space and time are no longer perceived as Newton’s absolutes, exposing deconstruction of temporal and historical continuity, and revealing a world in flux: accelerated, fragmented, instantaneous, and process-dependent. Pointsman’s reflection on Roger Mexico and the younger generation speaks of this change: “he wrecks the elegant rooms of history, threatens the idea of cause and effect itself. . . . Will Postwar be nothing but ‘events,’ newly created one moment to the next? No links? Is this the end of history?” (Pynchon 56). A new science of statistical regularities and probabilities started to challenge the causality principle, constituting a universe saturated with random events, which move at different speeds, and disclose the pulsing rhythms of divergent time scales, illuminating multiple temporalities of both difference and repetition (Deleuze, 1994). Pynchon’s post-war “Zone” unveils these aspects of “any-space-whatever,” deterritorialized, with no coordinates, “demolished or being reconstructed, its waste grounds, . . . its undifferentiated urban tissue, its vast unused spaces,” where the “preterite” await “an extinction, a disappearing,” announcing the shattering of the action-image (Deleuze, *Cinema 1* 121). The characters are “found less and less in sensory-motor ‘motivating’ situations, but rather in a state of strolling, of sauntering, or of rambling” (Deleuze, *Cinema 1* 121), particularly Slothrop and the “preterite” in the Zone.

The Crisis of the Action-Image: Entrapped between the Virtual and the Actual

This “crisis of the action-image” (Deleuze, *Cinema 1* 121) is displayed throughout the novel, and the last scene corroborates it for both the spectators (waiting for the show to start as the rocket approaches) and the last image on the screen, as well as the subsequent absence of images on the screen, advocate inactivity: “The last image was too immediate for any eye to register. It may have been a human figure, dreaming of an early evening in each great capital luminous enough to tell him he will never die, coming outside to wish on the first star. But it was *not a star*, it was falling, a bright angel of death” (Pynchon 760). Pynchon’s italics in “*not a star*” sequence reveal double encoding of the phrase for the star is a deadly rocket and none of the novel’s heroes is a star. They are the “preterite,” forgotten and exhausted, starting with Slothrop who lost objectives in life and is “in a state of strolling, of sauntering” (Deleuze, *Cinema 1* 121), acting irrationally and changing disguises until he finally disappears, “scattered all over the Zone” (Pynchon 712). The rest of the characters, particularly the specimen that can be found in the Zone—displaced Hereroes, ex-movie stars, lost children, Argentine anarchists and alike individuals—are portrayed as underprivileged, dysfunctional outcasts and dreamers, already destined to death. The most conspicuous metaphor of this crisis of the action image is probably Major Marvy’s castration (Pynchon 609). And the last scene corroborates this analogy of characters’ impotence and exhaustion, anchored in the obscurity and tenebrosity at display, for the rocket “reaches its last unmeasurable gap above the roof of this old theatre” and the characters can only seek comfort in a brief “touch” or a “song” (Pynchon 760) before it hits, underlining their sensory-motor range limitations.

Yet, “something has kept on, a film we have not learned to see” (Pynchon 760), which associates with Virilio’s aesthetics of disappearance for “reality is never given, but is the outcome of a culture” (Virilio, “From Modernism” 34-5), and in the age of moving images, human consciousness can be said to unfold as an elusive succession of images because “persistence is no longer material but cognitive, it is in the eye of the beholder” (Virilio, “From Modernism” 33). On the basis of recent studies in neurophysiology and with reference to J. P. Changeux, Virilio points out that “images” have become “mental objects,” expressing his concern with “the instrumental virtual images of science and their paradoxical facticity” (Virilio, *The Vision* 60). What appears to have happened is that the filmic image, or to quote Virilio, “the real-time image dominates the thing represented, real time subsequently prevailing over real space, virtuality dominating actuality” (Virilio, *The Vision* 63) so that fictional merges with and, in a way, usurps the factual. Interestingly enough, the characters “created” because of the screening (or just affected much by the film industry, as Slothrop is) seem entrapped on the “frontier” between the virtual and the actual. They “switch” from one world to the other, which permits their momentary escape, but also causes their psychic fragmentation and even dismemberment (as with Slothrop), blurring the distinction between fiction and reality furthermore.

The cinematic space-time seems to merge with the reality of the characters, as in the scene where Jessica Swanlake interprets her relationship with Roger through cinematic metaphors and allusions. She believes that the war conditioned her to stay with him, and with no rockets falling, “[h]e has no words, no technically splendid embraces, no screaming fit that can ever hold her” (Pynchon 628). However, she experiences peace “as a bad cinema spring, full of paper leaves and cotton-wool blossoms and phony lighting,” as “the new world crept into and over her like a spring” (Pynchon 628), though this spring is associated with fake cinematographic scenes.

Deleuze’s “Crystal-Image”: Cinematic and Paracinematic Lives as Doubles

The influence of cinematography is not just present through the various references the text makes; films sometimes forge major changes in the lives of the characters. As many critics have already noted, the screening of *Alpdrücken* inspired Franz Pökler to make love to his wife so that Ilse—their daughter—was conceived, and many other “shadow-children would be fathered on Erdmann that night” (Pynchon 397). Pökler later wonders if the “movie-child” Weissmann sends him is his daughter: “Isn’t that what they made of my child, a film?” (Pynchon 398). Even the leading actress, Margherita Erdmann got pregnant during the shooting of the film and gave birth to Bianca. Thus, the characters’ lives are not just informed by cinematography but at times created by filmic mediation, as Ilse and Bianca were conceived due to *Alpdrücken* and the “real, paracinematic” Schwarzkommando incarnated from von Göll’s footage “images” (in his opinion), embodying phony, fictive Schwarzkommando, the conclusion being that: “There are worse foundations than film” (Pynchon 388).

Alpdrücken and Schwarzkommando can also be analyzed in terms of Deleuze’s crystal-image scheme for the actual and the virtual coexist and oscillate, and are projected on both sides of the screen—on film and its characters and actors, and among the spectators. Thus, “Ilse, fathered on Greta Erdmann’s silver and passive image, Bianca, conceived during the filming of the very scene that was in his thoughts as Pökler pumped in the fatal charge of sperm—how could they not be the same child?” (Pynchon 576-577) The girls appear as two mirrored aspects within the same crystal-image, and both emerge as filmic—episodic characters. Johnston names this style of prose “post-cinematic,” observing how the novel “respond[s] to a sense of the cinema as an apparatus for producing and disseminating images which both construct and control a new kind of subject” (Johnston, “Post-Cinematic” 90). A particular “post-cinematic” passage where Slothrop bids farewell to Bianca (Johnston, “Post-Cinematic” 92) and which involves another female character from Slothrop’s past (Pynchon 471-72) reflects the crystal-image pattern. Through appearance and disappearance acts in the scene, the nameless girl “at the end of a lunchwagon counter” (Pynchon 471) becomes indiscernible from Bianca—which the narrator intensifies by using the inconclusive pronoun “she” so that the two figures are indistinct and create a crystal-image. Since in Deleuze’s conception “[t]he

present is the actual image, and *its* contemporaneous past is the virtual image, the image in a mirror,” and Bergson’s “paramnesia” (illusory déjà-vu) consists of both perception and recollection (Deleuze, *Cinema 2* 79), the girl appears as Bianca’s “simultaneous double” (Deleuze, *Cinema 2* 68), but the two are indistinct for we do not know whom the narrator addresses when speculating, “she must be more than an image, a product, a promise to pay...” (Pynchon 472)

In a similar manner, “leading real, paracinematic lives” (Pynchon 388)—Schwarzkommando—“fraudulent African rocket troops” (Pynchon 113) are both virtual and actual, existing on film and in the Zone, for “there is no virtual which does not become actual in relation to the actual, the latter becoming virtual through the same relation” (Deleuze, *Cinema 2* 69). As Flaxman explains, “crystalline narration . . . emerges as a power of the false,” where “the story is based on irrational linkages, a practice of false continuity in which images coagulate and disperse, in which we experience the world as a field of forces” (Flaxman 33). Pynchon’s narration is full of these images which coalesce and scatter, thoroughly overflowed by film, *Alpdrücken* in particular. Slothrop is the most mediated protagonist, ultimately scattered (Pynchon 712), assuming roles and serving as a “surrogate” (Pynchon 397). Bianca and Ilse are mapped one onto the other and Gottfried is mapped onto them so that at times even the characters’ parents cannot distinguish them (Pynchon 102; 484; 671). Deleuze’s “powers of the false” seem utilised through these figures in particular, representing the drive toward becoming for “there is only becoming, and becoming is the power of the false of life, the will to power” (Deleuze, *Cinema 2* 141). There is no single “truth,” everything changes and new possibilities are created “in the outpouring becoming” (Deleuze, *Cinema 2* 141), and these characters appear as “experts in metamorphoses of life” (Deleuze, *Cinema 2* 142).

Virilio’s “Aesthetic of Disappearance:” War Machine and Cinema Industry—Reality Prefigured in a Film

Both Bianca and Ilse emerge as episodic characters for Bianca dies on the Anubis, and Ilse’s dis/appearance reveals filmic, intermittent disposition:

[s]o it has gone for the six years since. A daughter a year, each one about a year older, each time taking up nearly from scratch. The only continuity has been her name, and Zwölfkinder, and Pökler’s love—love something like the persistence of vision, for They have used it to create for him the moving image of a daughter, flashing him only these summertime frames of her, leaving him to build the illusion of a single child ... what would the time scale matter, a 24th of a second or a year. (Pynchon 422)

This quote corroborates two things tied to the onslaught of filmic images within this novel and contemporary society in general. First, we live in a space-time of spectacle where everything is prone to cinematisation and war draws on spectacle-like methods and technology, where visual representations entrap the consumers (in this case characters and readers) into filmic, false reality. Virilio illustrates how warfare utilises perception, where psychological manipulation (which “They” used on Pökler) and the installation of fear through representation of sophisticated weaponry and violence, play a crucial role, inevitably linking war and cinema (Virilio, *War* 5-6). With “the moving image of a daughter,” releasing Ilse from Dora—the prison camp, for a week or two every summer—Weissmann kept Pökler in line so that he does not “sabotage[*e*] the rocket program” (Pynchon 414), breeding both fear and hope. What Franz later on finds in Dora are “naked corpses . . . stacked in front of the crematoriums” (Pynchon 432), confirming that in war images are ammunition for “wartime death . . . serves as spectacle” (Pynchon 105), a way to captivate the enemy or to motivate hesitant allies like Pökler.

Second, Pökler’s insecurity regarding Ilse’s identity, his inability to know whether “this child was his own” (Pynchon 418) or “some Ilse” (Pynchon 429), sustained in Ilse’s yearly appearance and disappearance acts, promotes an aesthetic of disappearance as her filmic representations support the cognitive “persistence of vision.” Cinema operates with speed, the contemporary image is “a speed-image” (Virilio, “Speed-Space” 70), and Pökler knows a film speed of twenty-four frames per second past the projector beam is ideal for accommodating a “persistence of vision.” But, with these accelerations “the time scale” does not matter,

“you could speed or slow at will” (Pynchon 422), for Ilse has become an elusive child, a (dis)continuity of “the moving image,” which, recalling her film-induced “creation” and exclusively “summertime frames,” makes sense. As Virilio explains, “the persistence is now only retinal,” it is “the real as fleeting, as uncertain . . . reality is shown as fugacious,” concluding that “we, too are fleeting” (Virilio, “Speed-Space” 70).

The father-daughter relationship and, sadly, all their exchange result in multilayered “persistence” of the reproductions of the cinematic space-time. The reality that links Ilse and Pöckler has become a replica of the scenes from *Alpdrücken*, which is explicitly displayed both in his fantasies of their sexual liaison and when he slaps her. She was a victim: hungry, “beaten, perhaps violated” in Dora, and even though he cannot be considered a torturer (as his movie counterpart), he did turn a blind eye to the atrocities she was exposed to, not aware of the “darkness in her eyes . . . swimming orbits of pain” (Pynchon 428). Franz realizes he can blame Weissmann but also that he needs to address his own “inconveniences for caring” for “They have sold him convenience . . . and now They were collecting” (Pynchon 428). The top-secret launching at Peenemünde “They” allowed Ilse to watch was also a message that he understood much later, meaning “there was no violation of security: *there was no one she could tell who mattered*” (Pynchon 409). It is just one more filmic scene father and daughter engage in, only more spectacular, but as Pluto’s “*deliberate resurrection*,” it is: “Staged. Under control. No grace, no interventions by God” (Pynchon 415) and “[a]t any moment the illusion they stood on would dissolve” (Pynchon 409), and Ilse would return to the prison camp. Pynchon is here hinting at remediation and infections from screen to paper and to reality, from virtual to actual, including material processes that actually enable a “persistence of vision” and can remodel somebody’s life literally.

These and similar events demonstrate that “reality” (within the novel) is prefigured in a film, as if the film were to precede reality. The following scene that discloses von Göll’s thoughts is a perfect example:

[s]ince discovering that Schwarzkommando are really in the Zone, leading real, paracinematic lives that have nothing to do with him or the phony Schwarzkommando footage he shot last winter in England for Operation Black Wing, Springer has been zooming around in a controlled ecstasy of megalomania. He is convinced that his film has somehow brought them into being. “It’s my mission,” he announces to Squalidozzi, with the profound humility that only a German movie director can summon, “to sow in the Zone seeds of reality. The historical moment demands this, and I can only be its servant. My images, somehow, have been chosen for incarnation.” (Pynchon 388)

Von Göll/Springer has made the fictive version, a film about black rocket troops before this discovery, with one Zouave and various members of Pointsman’s staff, which he thinks conditioned the appearance of the real Schwarzkommando, taking credit for the transformation from the fictive to the real.

Pynchon uses an example from real, historical space-time where a film prefigures reality, demonstrating how Fritz Lang’s 1929 science fiction movie, *Frau im Mond*, which features scientific speculation about rocketry and space travel, augured the real-time launching of the first long-range guided ballistic missile. Although pure Expressionist artifact with a hackneyed plot, which features “technical clumsiness and scientific naïveté,” Lang’s film was viewed by the young rocket engineers in Weimar Germany, including Wehrner von Braun (Moore 40). Pynchon’s fictional engineer Pöckler, who knows von Braun, viewed the movie with his wife: “Franz was amused, condescending. . . . He knew some of the people who’d worked on the special effects. Leni saw the dream of flight. One of many possible. Real flight and dreams of flight go together” (Pynchon 159). Indeed, after more than a decade of experiments, because dreams and reality go together, on October 3, 1942, the first A-4/V-2 rocket was successfully fired from Peenemünde, following its trajectory perfectly.

Most of the films tied in with *Gravity’s Rainbow* are of political substance. They are closely connected to the war and its warlike industrial complex, for film, especially during war, “works as propaganda, as a way of making a certain political version of the world seem natural” (McHoul and Wills 41). In *Gravity’s Rainbow*, film functions mostly through oppression and consternation, with its primary goal to manipulate, which is another example of the threatening impact that the fictive exercises over the real. Virilio regards war as cinematic and even his implications of cinema’s complicity with the military-scientific/war machine are consistent for the omnipresence of screening enables shared, mediated consciousness where representation and perception are crucial. Such films idealise war, making it attractive and praise-worthy: “the lads in

Hollywood telling us how grand it all is over here, how much fun” (Pynchon 135). Still, apart from disclosing militarized contents and marketing of film industry, Pynchon actually goes “behind the scenes,” exposing the forces behind the production as repressive power structures in possession of chemicals such as “Emulsion J,” “Kryptosam,” and the polyimide “Imipolex G,” which are closely consolidated with corporate hierarchy, the military and political establishment, thus allowing these powerful conglomerates to direct the economy.

The danger emerges when transnational cartels blend shared ownerships with the concentration of power so that their interests pervade and exercise global corporate control, ignoring boundaries and morality, “cutting across and demolishing the barriers of secrecy and property that separated firm from firm,” where business is “the rightful authority” (Pynchon 165). Pynchon delves into international capital arrangements, particularly among Imperial Chemical Industries, IG Farben and their subsidiaries to reveal the power of the “elect,” who are a few controlling all this machinery. IG Farben made a deal with Slothrop’s father when he was an infant so that he feels “sold . . . like a side of beef,” for they experimented on him with Imipolex G and the smell is still “haunting him” (Pynchon 286). IG Farben was “one of Nazi Germany’s central cartels and in its time one of the ten best-capitalized businesses in the Western world, its reach literally global” (Herman and Weisenbrger 99). The same company and Laszlo Jamf developed “Kryptosam,” which “in the presence of some component of the seminal fluid . . . promotes conversion of the tyrosine into melanin, or skin pigment” (Pynchon 71). As Curtin explains, “Kryptosam . . . provides Western imperialist white males with the ability to generate blackness immediately and consciously from their own semen” (73). Hence, the book dramatizes the repercussions of the latest inventions and technological interventions, such as “Kryptosam,” the invisible ink which becomes manifest only when doused in semen. Using this technology, Pirate gets the information, “a revelation through the nacreous film of his seed, in Negro-brown, comes his message” (Pynchon 72). Another of Jamf’s inventions, “Emulsion J” enables von Göll to use this special developing fluid “which somehow was able, even under ordinary daylight, to render the human skin transparent to a depth of half a millimeter, revealing the face just beneath the surface” (Pynchon 387), which serves also as an allusion to the dissolving materiality of characters/people in this space-time.

The Camera Frames Unstable Identities

Industrial networks and technology have taken the central position for “this War was never political at all, the politics was all theatre, all to keep the people distracted . . . secretly, it was being dictated instead by the needs of technology . . . by a conspiracy between human beings and techniques” (Pynchon 521). The characters have lost their sense of reality and identity in war, allegedly living outside of movies they watch, though they seem trapped within them: “In silence, hidden from her [Katje], the camera follows as she moves deliberately nowhere . . . alone in the house, except for the secret cameraman and Osbie Feel” (Pynchon 92). Likewise, “[n]ow the boy [Gottfried] moves image to image, room to room, sometimes out of the action, sometimes part of it . . . whatever he has to do, he does. The day has its logic, its needs, no way for him to change it, leave it, or live outside it. He is helpless, he is sheltered secure” (Pynchon 721). Just as no actor escapes from the movies, nobody can escape the specific space-time of war; Katje and Gottfried are confined within the designated longitude and latitude, paralysed, incapable of control, and under surveillance. In a similar manner, the spectators are not resistant to ideological and political matters propagated through the screen, cinematography is perceived as an agency of authority and supervision so that the consumers of entertainment are metaphorically captured through channels/means of identification.

Pynchon constantly challenges his protagonists (and readers) with ontological and epistemological questions, uncovering cinema as an agency which transfers the empiricism, metaphors, and correspondences tied to the human condition. The camera not only emulates but replicates their circumscribed state and subordination, which brings to mind Tchitcherine’s questioning of the reality and/or hallucination ambience while under Jamf’s intoxicant (Oneirine haunting), which he identifies as “radical-though-plausible-violation-of-reality” (Pynchon 704). The examples of the protagonists’ vulnerability and indoctrination are influence and control that they exercise among one another, utilised by staged or framed scenes. Thus,

Slothrop is manipulated to save Katje, as she is apparently under attack by Gregori, the octopus, who was conditioned by film to respond to her. The scene consequently recalls Pöckler's response to *Alpdrücken*, which is tied back to Slothrop via actor Max Schlepzig, whose pass Slothrop uses to enter Potsdam, "pos[ing] as a vaudeville entertainer" (Pynchon 377).

As featured in contemporary cinema, fictional characters can display troublesome and unstable identities, voicing postmodern schizophrenia, a collective psychosis in Jameson's (1991) or Deleuze and Guattari's (1983) sense, with no personality of their own. At times they appear as collages of characters from books, films, and television put together. For example, *Me, Myself and Irene* (2000) features a character with multiple personality disorder, where the doubling serves as a comedic device, whereas in *Fight Club* (1999) the protagonist's *splitting* drives the dramatic thriller, and in the most recent film *Split* (2016), different personalities (at least twenty-three) within one man deliver a flamboyant psychological thriller. These characters not only illustrate the usual crisis of identity in contemporary film and literature (loss of history, feelings of entrapment within inherited cultural identity, the shift of patterns in self-hood, etc.), but exhibit dissociative identity disorder (fragmenting into two or more distinct personality states with extremes in behaviour, conflict, and even inclination to violence). Likewise, Slothrop's identity fluctuates as he adopts numerous disguises so that he becomes a British journalist Ian Scuffling, Rocketman, German actor, Russian secret agent, and Pig-Hero Plechazunga. Cinema, fiction, and life have become fully entwined. As Joseph Slade observed more than four decades ago:

[i]mplicit in the construction of Pynchon's characters is the idea that the self is really an endless fluctuation of sensibility, rather like a film sprocketing through a projector. At any given moment the focus or frame changes. The self is thus not so much thought as lived; its existence is predicated on shifting multiple states of consciousness. (Slade 152)

In the case of *Gravity's Rainbow*, the blending of war actualities and filmic imagination conditioned characters to "behave like Western heroes, German supermen, or zombies, as if they lived in a film reality" (Strehle 35). Slothrop, the most conditioned/mediated of all characters, and also the one that has "been to enough movies" (Pynchon 114) is highly fragmented. He imitates his favourite actors: Cary Grant (Pynchon 292) and Errol Flynn (Pynchon 248; 381), and easily assumes various roles and identities. Through his transformations Pynchon demonstrates how medial identities have no solid grounding or indefinite divisibility, and he serves as a prime example of a personality that is remodelled by cinematography. This might be an understatement for Slothrop is mediated in every possible way so that he has, in a conventional sense, lost (or rather—reshaped, in Deleuze's terms—"metamorphosed") his identity, manifesting the psychopathology of our postmodern (or posthuman) condition. Towards the end of the novel, he appears as "one plucked albatross . . . *stripped*. Scattered all over the Zone. It's doubtful if he can ever be 'found' again, in the conventional sense of 'positively identified and detained'" (Pynchon 712). Fragmented, scattered, and alienated in the space-time of war and advanced capitalism, Slothrop keeps "disintegrating into a series of more and more ephemeral traces . . . falling victim to the Δt ," unable "to engage with past or future," he only "exists in the immanent present" (Gourley 101). Thus the notion of his disappearance from the text, for even the narrator cannot locate him any longer due to his "tenuous" (Pynchon 509) persona, his invisibility.

Pynchon's referential scopes of Slothrop as the most mediated character certainly underline his idea of modern world identity crisis (and Deleuze's action-image crisis), promoted by military-industrial complex and overall cinematic penetration. Still, as this article illustrates, the cinematic texture of the novel's narration surpasses Slothrop's transformation. It is deeply ingrained on almost every page, as McHale notes, through "plethora of allusions to specific movies, film genres, directors, stars, techniques, . . . its cinematic models of behaviour and movie-based metaphors and idioms, its transgressions of the boundary between cinema and real life" (120). Pynchon's cinematic minutia and the entire matrix of practices related to film culture, its intertexts and metaphors emphasise that the world we live in is highly mediated and that the ascendancy of mass media only generates more confusion in the complex relationship between the real and the virtual.

Conclusion: The Cinematic Captures a World in Flux, the Shift in Human Consciousness, and Actual-Virtual Indiscernibility

Acknowledging Eco’s (1962) study on the openness of texts and Whitehead’s (1978) process philosophy, reinforced by Prigogine’s (1997) and Serres’s (1995) work on dissipative structures and self-organization, and Bolter and Gruisin’s (1999) fundamentals on interpenetration of media, texts are regarded as open, dynamic systems, always in fluctuation and in exchange of information, generating intermediation between their own unstable systems of codes, other media, the reader, and culture at large. Dismissing Newton’s absolute space and time for an animate, dynamic, and interconnected sphere of space, time, matter, and energy, formulated by Einstein, Planck, Bohr, Heisenberg, and Prigogine, postmodern authors, with Pynchon in the forefront, deny any claim of absoluteness in critical discourse, disclosing a world that is process-dependent, in constant flux, fertile with fragmentation, discontinuity, and mutability. Additionally, in postmodernism, “representation is short-circuited by the realization that there is no reality independent of mediation” (Hayles, “Saving” 779), and “images define a new kind of reality in a world which seems to have entirely lost all substance, anchoring, or reference points, except in relation to other images or what are also conceived as images” (Johnston, “Post-Cinematic” 96).

Cinematography was the first medium which created the illusion of motion by manipulating and animating still images so that motion-picture photography is perceived as continuous movement, disseminating the creative capacities of the medium and generating immensely original and multifaceted realms that alter existing conceptions of reality. Pynchon unravels these permutations of image-manipulation in *Gravity’s Rainbow*, exposing film as an apparatus and a thematic composition, but what is more, the novel’s cinematic ambience captures the shift in human consciousness at the close of World War II. The high speed of moving (light) images, the appearance and disappearance acts (Virilio, 1991), reflect the accelerated temporal rhythms of the capitalist mode of production, its military-industrial-entertainment industry, consumerism, and instantaneity, imprisoning viewers through means of identification so that the virtual dominates the actual (Virilio, *The Vision* 63), suspending dualistic impulses between embodied motion and disembodied stimulus. In Deleuze’s terms, the war and the shattering of the sensory-motor schema made possible the “emergence of a cinema of time” (Deleuze, *Cinema 1* ix), for we see time split in the crystal-image where “the crystal constantly exchanges the two distinct images which constitute it, the actual image of the present which passes and the virtual image of the past which is preserved: distinct and yet indiscernible” (Deleuze, *Cinema 2* 81). This perpetual exchange constitutes a “double-sided image . . . both actual and virtual,” without completion (Deleuze, *Cinema 2* 273), mirrored in Pynchon’s “any-space-whatever” locations (the Zone in particular), and in his characters (especially Ilse, Slothrop, Katje, and the Schwarzkommando), which promotes the deconstruction of temporal and historical continuity, where camera not only mimics but duplicates the protagonists’ circumscribed condition, and reveals fracture, inconsistency, and discontinuity of both time, space, and its subjects.

This paper expands existing scholarship on the representations of cinematography in *Gravity’s Rainbow*, addressing intermedial reflexivity from screen to paper, its alterations, representations, and animation informed by Paul Virilio’s and Gilles Deleuze’s film philosophy. It exposes the variety of film references, filmmaking techniques, cinema traditions, deployed cinematic metaphors and articulations, utilised audiences and powerful (chemical) industries which shelter military-industrial-entertainment agencies that instruct, survey and control the public, raising compliant generations of consumers, with desired modes of behaviour. The thematic proliferation of filmmaking images and signs (at times straightforward and sometimes equivocal) that emerge from this kaleidoscopically challenging text demonstrate how the projections of the virtual are pressing the subjects to perform in predisposed comportment, obstructing their “sensory-motor” range (Deleuze, *Cinema 1* 121), so that virtuality both generates and even dominates reality (Virilio, *The Vision* 63), where the screen advocates its supremacy over the page and the actual world. Or, in a less foreboding view, the virtual and the actual image coexist (Deleuze, *Cinema* 283), as do technologies and humans for we design and use technology, which in turn shapes our lives and consciousness, creating new problems to solve (Ryan 142). These images are mirroring, mapping onto and adapting to one another

(as are Pynchon's characters) to the point of indiscernibility. The movement-image gave way to the time-image, which is direct and simultaneous, "plunged into time rather than crossing space," deterritorialized, where "the sheets of past coexist in a non-chronological order" (Deleuze, *Cinema 2* xii), as events unfold in *Gravity's Rainbow*, gravid with cinematic concepts. The film-saturated space-time that emerges, along with speed and acceleration, offers a growing awareness of living a multiplicity of times and of moving at different speeds (as Pöckler and Slothrop experience), projecting the realm where the real and the virtual are indiscernible.

Works Cited

- Armitage, John. Ed. *Virilio Live: Selected Interviews*. SAGE, 2001.
- Berressem, Hanjo. *Pynchon's Poetics: Interfacing Theory and Text*. Illinois University Press, 1993.
- Bolter, Jay David and David Gruisin. *Remediation: Understanding New Media*. MIT, 1999.
- Caviola, Hugo. *In the Zone: Perception and Presentation of Space in German and American Postmodernism*. Birkhäuser Verlag, 1991.
- Curtin, Maureen. *Out of Touch: Skin Tropes and Identities in Woolf, Ellison, Pynchon, and Acker*. (Literary Criticism and Cultural Theory). Routledge, 2003.
- Deleuze, Gilles. *Cinema 1: The Movement-Image*. Translated by Hugh Tomlinson and Barbara Habberjam, University of Minnesota Press, 1986.
- , *Cinema 2: The Time-Image*. Translated by Hugh Tomlinson and Robert Galeta, University of Minnesota Press, 1989.
- , *Difference and Repetition*. Translated by Paul Patton, Columbia University Press, 1994.
- , "Postscript on the Societies of Control." *JSTOR October* 59 (1992): 3-7. Web 9 March 2017. <cidadeinseguranca.files.wordpress.com/2012/02/deleuze_control.pdf>
- Deleuze, Gilles and Felix Guattari. *Anti-Oedipus: Capitalism and Schizophrenia*. Translated by Robert Hurley, Mark Seem and Helen Lane, University of Minnesota Press, 1983.
- , *A Thousand Plateaus*. Translated by Brian Massumi, University of Minnesota Press, 1987. Web 17 February 2017. <file:///C:/Users/PC/Downloads/deleuzeguattarirrhizome.pdf>
- Eco, Umberto. *Opera aperta: forma e indeterminazione delle poetiche contemporanee [The Open Work]*. Bompiani, 1962.
- Farrelly, Bobby and Peter Farrelly. Dir. *Me, Myself and Irene*. Twentieth Century Fox, 2000.
- Fincher, David. Dir. *Fight Club*. Twentieth Century Fox, 1999.
- Flaxman, Gregory. Ed. "Introduction." *The Brain is the Screen: Deleuze and the Philosophy of Cinema*. University of Minnesota Press, 2000: 1-60.
- Foucault, Michel. *Discipline & Punish: The Birth of the Prison*. Translated by Alan Sheridan, Vintage, 1995.
- Gourley, James. *Terrorism and Temporality in the Works of Thomas Pynchon and Don DeLillo*. Bloomsbury Academic, 2013.
- Harvey, Lawrence. "To Cry from Within or Without? Pynchon and the Modern—Postmodern Divide." *Orbit: Writing Around Pynchon*. 2.1 (2013). Web. 8 March 2016. <www.pynchon.net/articles/10.7766/orbit.v2.1.47/.>
- Hayles, N. Katherine. *My Mother Was a Computer: Digital Subjects and Literary Texts*. University of Chicago Press, 2005.
- Hayles, N. Katherine. "Saving the Subject: Remediation in *House of Leaves*." *American Literature* 74.4 (2002): 779-806.
- Heise, Ursula K. *Chronoschisms: Time, Narrative, and Postmodernism*. Cambridge University Press, 1997.
- Herman, Luc and Steven Weisenburger. *Gravity's Rainbow, Domination, and Freedom*. University of Georgia Press, 2013.
- Jameson, Frederick. *Postmodernism, or, The Cultural Logic of Late Capitalism*. Duke University Press, 1991.
- Johnston, John. "Machinic Vision." *Critical Inquiry* 26 (1999 Autumn): 27-48.
- , "Post-Cinematic Fiction: Film in the Novels of Pynchon, McElroy, and DeLillo." *New Orleans Review* 17.2 (1990): 90-97.
- Lang, Fritz. Dir. *Frau im Mond*. UFA, 1929.
- Marquez, Antonio. "The Cinematic Imagination in Thomas Pynchon's *Gravity's Rainbow*." *Rocky Mountain Review of Language and Literature* 33.4 (1979): 165-179.
- McHale, Brian. *Constructing Postmodernism*. Routledge, 1992.
- McHoul, Alec, and David Wills. *Writing Pynchon: Strategies in Fictional Analysis*. University of Illinois Press, 1990.
- McLuhan, Marshall. *Understanding Media: The Extensions of Man*. Routledge, 2006.
- Moore, Thomas. *The Style of Connectedness: Gravity's Rainbow and Thomas Pynchon*. University of Missouri Press, 1987.
- Prigogine, Ilya (in collaboration with Isabelle Stengers). *The End of Certainty: Time, Chaos, and the New Laws of Nature*. The Free Press, 1997.
- Pynchon, Thomas. *Gravity's Rainbow*. Vintage, 2000.
- Ryan, Marie-Laure. "Net.art: Dysfunctionality and Self-Reflexivity." *Between Page and Screen: Remaking Literature Through Cinema and Cyberspace*. Ed. Kiene Brillenburg Wurth, Fordham University Press, 2012: 127-143.
- Serres, Michel with Bruno Latour. *Conversations on Science, Culture, and Time*. Translated by Roxanne Lapidus, University of Michigan Press, 1995.

- Shyamalan, M. Night. Dir. *Split*. Universal Pictures, 2016.
- Simmon, Scott. “Beyond the Theater of War: *Gravity’s Rainbow* as Film.” *Critical Essays on Thomas Pynchon*. Ed. Richard Pearce, G. K. Hall & co., 1981: 124-139.
- Slade, Joseph W. *Thomas Pynchon*. Warner Paperback Library, 1974.
- Strehle, Susan. *Fiction in the Quantum Universe*. University of North Carolina Press, 1992.
- Virilio, Paul. *The Aesthetics of Disappearance*. Translated by Philip Beitchman, Semiotext(e), 1991.
- . “From Modernism to Hypermodernism and Beyond. Interview with John Armitage.” *Virilio Live: Selected Interviews*. Ed. John Armitage, SAGE, 2001: 15-47.
- . “The Information Bomb: A Conversation. Interview with Friedrich Kittler.” *Virilio Live: Selected Interviews*, Ed. John Armitage, SAGE, 2001: 97-109.
- . “Speed-Space. Interview with Chris Dercon.” *Virilio Live: Selected Interviews*, Ed. John Armitage, SAGE, 2001: 69-81.
- . *The Vision Machine*. Translated by Julie Rose, British Film Institute, 1994.
- . *War and Cinema: The Logistics of Perception*. Translated by Patrick Camiller, Verso, 1989.
- Whitehead, A. N. *Process and Reality: An Essay in Cosmology* (Gifford Lectures, University of Edinburgh, 1927-28.). Ed. David Ray Griffin and Donald W. Sherburne, Free Press, 1978.