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THE MOTH AND THE BAT

A Cybernetic Reading Of Ted Chiang's *The Lifecycle Of Software Objects*

ABSTRACT

This paper analyzes Ted Chiang's novella *The Lifecycle of Software Objects* (2010) in light of the resurgent interest in cybernetics and postapocalypse fiction, while paratextually repurposing the Soviet metaphor of 'the moth and the bat' to describe our digital capitalist epoch. It uses an associative method to explore how Ana and Derek, the protagonists of the story, craft potential solutions to their ethical quandary, that is, the fact that their digients (digital entities raised as pets) have become obsolete thanks to the predominant logic of digital capitalism. The second half of the paper examines a cybernetic case study (Soviet mathematician Mikhail Tsetlin's theory of collective games of automata), and the metaphor which late-Soviet scientists used to describe their bureaucratic epoch: a moth being chased by a bat. Comparing the moth-and-bat metaphor to zoomorphic metaphors historically used to describe capitalism (the 'rat race' and Web Crawler), it argues that the repurposed Soviet metaphor most accurately describes our digital epoch. It appraises the novella's method for confronting human alienation in the face of anarchic obsolescence—a retreat into the heart, which celebrates the anachronistic ethic of motherly devotion. This paper contributes to speculative fiction studies and cybernetics scholarship by rediscovering an accurate metaphor for our fraught relationship withthe digital world, and by theorizing an intuitive escape from the grasp of cybernetic thinking.

KEY WORDS: cybernetics, speculative fiction, metaphor, digital capitalism, motherhood

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INTRODUCTION

In his article "Uses of the End of the World: Apocalypse and Postapocalypse as Narrative Modes," Connor Pitetti describes how apocalyptic narratives express consonance: "a sense that historical time is governed by a definite structure or organizational principle inside of which events that would otherwise be experienced as chaotic or arbitrary find a place and a justification."[2] He argues that postapocalyptic narratives, in contrast, are more successful in their depiction of the actual dynamics of reality, because they offer "a messier account of history as an endless series of incomplete changes and partial transformations . . . [The postapocalyptic story] curves back on itself in a series of modulated repetitions with difference."[3] He critiques the tendency for stories describing an apocalyptic dynamic to fall into an easy, linear narrative, with a well-expounded beginning and end. *The Lifecycle of Software Objects*, a novella written by Ted Chiang, does not fall into this trap. It is a "true" postapocalypse, according to Pitetti's definition, because it is structured in a repetitive, modulating pattern, with an ambiguous telos.

The narrative of *The Lifecycle of Software Objects* takes place in a not-too-distant future setting. The main characters, Ana and Derek, are tech-savvy coworkers in a software firm, which develops digients: "digital entities" bought by consumers and trained as pets. The digients are somewhat primitive in their appearance and childlike in their activities, and their avatars inhabit a virtual world, a habitation called "Data Earth." Ana raises a digient named Jax, and Derek adopts two digients, Marco and Polo. Ana and Derek are forced to contend with the obsolescence of their digients; they must explore several methods of maintaining their digients' economic, social, and technological feasibility in a fully digitized and competitive online world.

The central issue in the novella, which can also be linked to its repetitive narrative, is obsolescence. In some ways, it is the overarching quality of our digital world, as our technological products perpetually devolve into inoperability (think of the phasing out of the iPhone headphone port as a relatively recent, mundane instance). Obsolescence is also an important aspect of the apocalyptic tendency in fictional narratives, in its destruction of old worlds and products to produce/reveal new ones. In the novella, this obsolescence is manifested in the phasing out of the 'Neuroblast' digients (the old generation), to which Ana's and Derek's digients also belong, and their replacement by several competing companies' products, which are more optimized, efficient, and popular. It also occurs in how Ana and Derek are

2 Connor Pitetti, "Uses of the End of the World: Apocalypse and Postapocalypse as Narrative Modes," *Science Fiction Studies* 44, no. 3 (2017): 443. Pitetti's definition of apocalyptic texts draws from Frank Kermode's *The Sense of an Ending* (1967), which argues that storytelling is a method for making sense of the anarchic experience of lived history.

3 Pitetti, 445.

forced to contend with the obsolescence of their own employer, the software company Blue Gamma,[4] which goes bankrupt, thereby unleashing even more waves of unstoppable digital obsolescence. Conceptually, much of the terminology in this paper comes from the lexicon of cybernetics, and I believe that Chiang's novella is perhaps the most crystalline, orthodox example of cybernetic fiction of the 21st century so far. Cybernetics, as a multidisciplinary field, comes from the Greek word *kubernetes* (meaning 'helmsperson'), and asserts the triumph of self-guided technical *method* over philosophical reasoning or political ideology. In Chiang's novella, such a reliance on automatism and mechanization is criticized by the author, who creates a fictional digital world, called 'Data Earth,' that has overcome the dualistic poles of pre-digital life. This in turn creates a totalizing, opaque 'Absolute': a cosmic force which renders everything obsolete and disposable. Ted Chiang expertly critiques the cybernetic presuppositions that undergird the systems of economic and digital control in our epoch, and I argue that Chiang's novella should be read as an exemplary text illustrating the dynamic of contemporary alienation in the face of a seemingly totalizing digital Absolute. As a solution to this alienation, Chiang's novella proposes a retreat into the heart, and a celebration of the ethics of motherhood, which in comparison seems like an unexpected, anachronistic terrain.

NARRATIVE MODULATIONS: CONTENDING WITH OBSOLESCENCE

Ana and Derek's methods to save their digients from obsolescence reveal some of the key aspects of contemporary digital capitalism: emotional management, pornographization, and auto-exploitative productivism. Their attempts to provide a new future for their digients in a series of modulating actions mimic the alterations of an electronic waveform. In the novella, the platform for which the Neuroblast digients were built, Data Earth, gets acquired by a competing corporation called 'Real Space.' For Ana's digient Jax and the other members of the Neuroblast generation, this "essentially means the end of the world."[5] The withdrawal of the old generation of digients also results in the depopulation of Data Earth, and the once-flourishing digital world becomes "... a ghost town the size of a planet. There are vast expanses of minutely-detailed terrain to wander around in, but no one to talk to ... There are dungeons without quests, malls without businesses, stadiums without sporting events; it's the digital equivalent of a post-apocalyptic landscape."[6] As a result of the endless churn of market optimization, Data Earth resembles a kind of deserted, flyover city, and its digient inhabitants are deemed too crude and awkward for the market's ever-shifting preferences. Not only are the Neuroblast digients being rendered obsolete, but their digital habitat is destroyed as well. Byung-Chul Han, in his

4 Ted Chiang, *The Lifecycle of Software Objects* (Burton: Subterranean Press, 2010), 15.
5 Chiang, 37.
6 Chiang, 38.

2017 book *In the Swarm*, precisely describes the effects of this digital liquidity, characterized by permanent change and lack of fixedness: "The digital order is dispelling the [stability] of the earth once and for all . . . The digital medium equals the 'sea,' where 'firm lines cannot be engraved.'"[7] On a micro-scale, Data Earth is being made obsolete by the fact that the capitalist economy and digital order prefer sterile, efficient operation. This kind of unregulated, automatic market operation is described by Han, who writes, "Operations are *actomes*—atomized actions within a process that is largely automatic."[8]

Chiang's nod to a forsaken world is the first overt indication that the text is functioning in a postapocalyptic mode, according to Pitetti's definition. The narrative begins to take on a reiterative structure, embracing the ambiguity of humanity's temporal experience and repetitively detailing the manifold ways in which the digients' future is threatened. The text also asserts the protagonists' agency which, according to Pitetti, is foundational to the postapocalyptic narrative: "the need for active historical subjects to take responsibility for directing and shaping indeterminate and open-ended historical processes."[9] Ana and Derek now begin to actively confront the seemingly automatic obsolescence of the digients they have grown so fond of, and the world which the digients are tethered to. As a way to save Jax and the other digients, Ana considers taking on a sweetheart job (with a great salary and benefits) to train the Sophonce generation of digients, who compete with the Neuroblast generation. Sophonce digients are described as being more aggressive, optimized, and antisocial than the Neuroblast digients. While this is the first of the three proposed solutions to save the old digients, there is a caveat, however. Ana must use 'InstantRapport,' a patch that delivers doses of an oxytocin-opioid drug fusion, in order to increase her affection for the Sophonce digients and increase her productivity in training them. The narrator states that the Sophonce developers "figure that affection will produce better results, and the only way trainers will feel affection for Sophonce digients is with pharmaceutical intervention . . . It's a way to increase employee productivity."[10]

In his 2017 book *Psychopolitics*, Byung-Chul Han describes this as emotional management, wherein capitalist managers in the contemporary workplace rely on "a new, immaterial mode of production in which communicative interaction plays an ever-greater role . . . Managers today . . . [increasingly] resemble *motivation coaches*. [Emotions] form the pre-reflexive, half-conscious, physico-instinctual level of action that escapes full awareness. Neoliberal psychopolitics seizes on emotion *in order to influence actions on this pre-reflexive level.*"[11] Ana's prospective

7 Byung-Chul Han, *In the Swarm: Digital Prospects* (Cambridge: MIT Press, 2017), 51-52.
8 Han, *In the Swarm*, 52.
9 Pitetti, 444.
10 Chiang, 44.
11 Byung-Chul Han, *Psychopolitics: Neoliberalism and New Technologies of Power* (London: Verso, 2017), 47-48.

employer, the company Polytope, is practicing this kind of emotional management overtly, through drug-induced control of pre-reflexive emotions—the injection of an artificial affection for one's work. Information in digital capitalism, much like a pharmaceutical product, pre-reflexively possesses the digital subject and influences their communicative interaction—a clever connection at which Chiang seems to hint. Ana, however, eventually turns down this offer, avoiding the fate of becoming a drugged "motivation coach" for the Sophonce digients.

While Ana is considering the Sophonce proposal, the introduction of the second narrative solution to reverse the digients' obsolescence contributes to the repetitive quality of the novella, establishing a predictably episodic narrative structure. An offer arrives from Binary Desire, a company who approaches Ana, Derek, and the other Neuroblast digient owners with a new avenue for digient commodification: sexual optimization. Jennifer Chase, the company's spokeswoman, cleverly suggests that the digients, being older and more emotionally complex than their competitors, would someday prove to be good romantic and sexual partners to human beings. Chase says: "We want to offer sex partners with real personality, and we're willing to invest the effort needed to create that . . . As the digient gets to know a human, we'll enhance the emotional dimension of their interactions, both sexual and non-sexual, so they'll generate love in the digient."[12]

This notion of 'generating love' in a nonhuman, erotic Other illustrates Han's writing on capitalist economy and the all-compassing 'profanation' created by commodification. In *The Agony of Eros*, he writes: "Capitalism is aggravating the pornographication of society by making everything a commodity and putting it on display. Knowing no other use for sexuality, it profanes eros—into porn . . . The world is becoming more naked and more obscene."[13] In Chiang's novella, this profanation extends to the digients themselves, who are perceived as being suitable to be transformed into pornographic products due to their increasing sentience and emotional complexity—they are being profaned for their own market survival and consumer optimization. This solution is accepted by both Derek (who decides to sign the contract with Binary Desire) and Derek's digient Marco, who consents to being sold.[14] Chiang chooses not to show us the outcome of Derek's decision (the 'utopia' or 'dystopia' after the apocalypse), solidifying the postapocalyptic character of his narrative according to Pitetti's definition. Instead, Ana refuses Binary Desire's offer, and the story ends with Ana's interior thoughts of a resolution, in which she "imagines [Jax] loving and being loved, arguing and compromising . . . making sacrifices, some hard and some made easy because they're for a person he truly cares about."[15] The

12 Chiang, 48.
13 Byung-Chul Han, *The Agony of Eros* (Cambridge: MIT Press, 2017), 32-33.
14 Chiang, 63.
15 Chiang, 64.

parent-child bond between Ana and Jax has been solidified, but in its outward "reality" the plot remains unresolved, ending on an imaginary quotidian moment—it remains open to any number of future narrative options in response to the lasting possibility of obsolescence for the digients.

The final instance of narrative modulation occurs with Ana's last attempt to combat the digients' obsolescence. She invites two representatives from Exponential Appliances, a maker of physical household robots, to meet her and her fellow digient owners, and asks them to consider using the Neuroblast digients as models for their software. However, they are searching for "an entity of pure cognition, a genius unencumbered by emotions or a body of any kind, an intellect vast and cool yet sympathetic,"[16] which is not what Jax and his friends can provide. One of the company representatives says: "'We aren't looking for superintelligent employees, we're looking for superintelligent products. You're offering us the former, and I can't blame you; no one can spend as many years teaching as you have teaching a digient and still think of it as a product. But our business isn't based on that kind of sentiment.'"[17] Instead, their business is based on what Han calls "perpetual self-optimization," which "is supposed to therapeutically eliminate any and all functional weakness or mental obstacles in the name of efficiency and performance. Yet . . . Self-optimization . . . amounts to total self-exploitation."[18] While Han is here referring to employee self-optimization for the sake of maximizing economic productivity, Exponential Appliances represent the digient equivalent of this impulse—the exploitative impulse of dehumanization which, in Chiang's story, includes the non-human, digital entities, too. It is no coincidence that digients bred for this optimization literally go "feral," becoming balkanized and "dividing into loose, non-hierarchical troops."[19]

CYBERNETIC AESTHETICS: THE TOTALIZING DATA EARTH

The three attempts at crafting a future for the digients reflect cybernetic concepts: particularly auto-poiesis. Derek and Ana are trying to create an auto-poietic (literally, self-generating) future for digients, where they become independent beings. Auto-poiesis is the central aspect of classical (mid-20th century) cybernetics and has been adapted into contemporary discussions of artificial intelligence/sentience. However, Ana and Derek realize that they themselves are profoundly allo-poietic beings (reliant on a larger system for survival), both as employees of digital companies, and also as alienated individuals. Chiang, I argue, is critiquing the cybernetic presuppositions that undergird the digital and economic systems of control in our

16 Chiang, 56.
17 Chiang, 58.
18 Han, *Psychopolitics*, 30.
19 Chiang, 25.

(still-cybernetic) epoch. He does not do this in a didactic way, but instead manifests cybernetic processes performatively, shaping his prose to purposefully mimic its informal aesthetic conventions. The four ways he does this are by describing the digital realm (the 'digital earth') as a totalizing entity, by writing in a purposefully flat and sterile prosaic style, by depicting the digital realm as subject to temporal acceleration and spatial flattening, and by describing the digients' technological optimization in biological terms (as "genomic"). I will now explore these aesthetic aspects in the context of the current discourse on cybernetics, with a special focus on the philosopher Yuk Hui's 2020 essay "Machine and Ecology." Hui's essay is a refreshing attempt to challenge the artificial divide between the ecological (organic nature) and the mechanical (human production), and it accurately accounts for the destruction of dualism by cybernetic thinking. The same destruction of dualism is illustrated in Chiang's novella (albeit in an aesthetic vein), and Hui's essay helps ground our understanding of such a digital creation of a non-dualistic Absolute.

In the novella, the first interaction between humans occurs in the digital sphere, and there are few scenes which unfold in the real world. Thus, the majority of the narrative occurs in digital space, beginning with a virtual embrace between Ana and her friend Robyn (more specifically, an embrace between their digital avatars in Data Earth). "A step through [the portal] and she's in Robyn's virtual living room, on a residential aerostat floating above a semicircular waterfall a mile across. Their avatars hug."[20] The literal and metaphorical portal which Ana steps through (and almost never steps out of) is an entrance into the non-dualistic world of cybernetic logic. Hui describes this non-dualistic world as "creat[ing] a connection between different orders of magnitude—macro and micro, mind and body . . . a radical revaluation of the humanist values that oppose the organic and inorganic."[21] In a similar vein, Chiang's novella depicts a digital, inorganic world which has almost fully subsumed the organic world, rendering humans into virtual subjects, seemingly by their own voluntary participation. Hui goes on to discuss Marshall McLuhan's view that ecology (organic nature) is no longer merely a biological concept, proclaiming that "what we are witnessing is the disappearance of the earth, since it is continuously absorbed into a plane of immanence constructed by the recursive thinking of cybernetics."[22] It is no coincidence, then, that attempts to overcome the obsolescence of Ana's and Derek's digients fail. Their lives can be seen as microcosms of the repetitive, routinized structure of the fully-integrated, totalizing ecology they inhabit—a flat plane formed by the looping "recursion" described by Hui. The characters are victims of the logic which they have been conditioned to accept.

20 Chiang, 2.

21 Yuk Hui, "Machine and Ecology" in *Cybernetics for the 21st Century, Vol. 1: Epistemological Reconstruction,* ed. Yuk Hui (Hong Kong: Hanart Press, 2024), 45-46.

22 Hui, 49.

Chiang also posits a concrete cause and effect relation between human behavior and the postapocalyptic fate of Data Earth, when he describes its territory and geography: "its topography begins to erode; one by one, its virtual land masses disappear like real islands, vanishing beneath a rising tide of consumer indifference."[23] The human consumers, as an impersonal swarm, have lost interest in the fate of a once-beloved territory. Although they act without an apparent helmsperson or guiding ideology, they still exercise a forceful, absolute authority over Data Earth, based on their univocal alignment with the digital Absolute they inhabit, and its focus on automatism and operability. This is much like the medieval image of Boethius's Wheel of Fortune—itself a technical, proto-cybernetic object, which Fortuna spins with an 'indifferent' hand. It is no coincidence that Chiang does not describe an antagonist responsible for the obsolescence of the protagonists' beloved digients. In this world, there is no traditional antagonism such as war, and everything is subject to an opaque, dizzying and seemingly senseless anarchy. The *kubernetes* in charge of the system is the system itself, as the digital world has overcome the dualistic poles of pre-digital life, which means that now a human being can act as both the exploiter and the exploited. This aspect of Chiang's story illustrates Byung-Chul Han's argument that digital capitalism has moved from a Foucauldian biopolitical regime into an auto-exploitative psychopolitical regime which "provides the means for establishing . . . a *collective psychogram*."[24] The psychogram abolishes the difference between the exploiter and the exploited by forcing the digital subject to abdicate their agency, individuality, and intuition, in favor of the synthetic ease and convenience of digital collectivity. It also intersects with Hui's view of the cybernetic thinking of digital capitalism as "a thinking of totalization, since it aims to absorb the other into itself, like Hegelian logic, which sees polarity not as positional but rather as a motivation towards synthesized identity."[25]

Beyond a general discussion of the cybernetic setting of a totalizing digital earth in *The Lifecycle of Software Objects*, a closer analysis of the aesthetic of the novel is warranted, especially in how cybernetic visuals manifest in the narrative. The characters and setting lack any distinctive features, or a concrete 'texture.' The story lacks particularity and locality, existing on a sterile, generic digital plane. The characters are named, but they are hardly described sensorially, and exist only in their socioeconomic relation to one another—that is, according to their operationality. The animatronic 'body' for digients ordered by Neuroblast is given more of a visual description than Ana or Derek's real, human bodies. The digient body "[is] humanoid in shape but small, less than three feet . . . Its skin is glossy black and its head

23 Chiang, 27.
24 Han, *Psychopolitics*, 21.
25 Hui, 60.

is disproportionately large . . ."[26]—However, written language as a form of signification is largely withheld from Data Earth's inhabitants: "Marco or Polo never paid much attention to text before—there isn't a lot of it in Data Earth aside from on-screen annotations, which aren't visible to digients . . . ."[27] The digients cannot even 'read' their world, and are thus barred from individual, creative modes of enunciation.

Hui describes this global flattening, which entails a general loss of distinctive features when it comes to time and space, as a fundamental feature of 20th century technodigital culture. He states that:

> from the economic and technocratic perspective, there is very little value in taking locality into consideration, other than accounting for the availability of natural resources. The advancement of network technology will speed up the spatial compression . . . it is no use to discuss what might be called 'geographicality,' since all exchanges are done at the speed of light.[28]

The cybernetic quality of acceleration is also central to Chiang's novella. Entire years pass between chapters, and references to the passage of time are always accompanied by an 'update' on the state of the market in relation to the digients. The narrator, in one such instance, states: "Another year passes. Currents within the mantle of the marketplace change, and virtual worlds undergo tectonic shifts . . . ."[29] The temporal distortion of the narrative is also an aspect of Pitetti's characterization of postapocalyptic texts in that they reject a sense of narrative consonance and overarching order,[30] which is another feature that reinforces the relationship between postapocalyptic fiction and cybernetics. Additionally, the digients themselves are beings that are subject to a different temporal logic than humans, since they can be digitally 'frozen' or 'sped up' on their owners' whims. Jennifer Chase, the spokesperson of the company who wants to turn the old generation of digients into sexual commodities, says that the digients' sexual learning will take place during "periods where [they] can be run at faster than real time."[31] Therefore, this sense of untethered, accelerated time contributes to market optimization. This is another reflection of the totalizing nature of cybernetics which, in its accelerating and compressing gesture, flattens out spatial and temporal distinctions. Chiang's story can also be linked to contemporary globalization processes, which contribute to global creation and proliferation of sameness. *The Lifecycle of Software Objects* masterfully depicts this homogeneity, largely created by capitalist economy, that renders major cities into a mirror-image of every other city. Data Earth, too, comes to look like a

26 Chiang, 11.
27 Chiang, 20.
28 Hui, 58.
29 Chiang, 27.
30 Pitetti, 443.
31 Chiang, 48.

miniature of Ana and Derek's material world, in remaining absent of any distinctive features, or particular temporal and spatial qualities.

Lastly, the digients are described as being "genomically" engineered by Neuroblast—an evolutionary process which supports the digients' "cognitive development"[32] and "language learning" abilities.[33] From the beginning of the plot, the connection between digient and animal behavioral training and/or genetic intervention is apparent. This link becomes overt when Ana reflects on how the closing down of Blue Gamma mirrors the closure of the zoo in her prior profession:

> Blue Gamma's folding reminds her of the closure of the zoo, which was one of the most heartbreaking experiences of her life . . . . When she decided to retrain for the software industry, she was glad that she'd never have to face another such farewell in her new line of work. Now here she is, against all expectation, confronted with a strangely reminiscent situation.[34]

This is another instance of narrative repetition, where the events of her new life, as an employee of a digital company, mimic the events of her old life in an embedded, miniaturized way. The attempt to genetically optimize the digients manifests the totalizing quality of the digital epoch, as biology and computer science are now synthesized for the sake of corporate optimization. The digients' tendency for playfulness, curiosity, and sociability are bred out through 'genomic' engineering by Sophonce, resulting in "an engine that favors asocial behavior and obsessive personalities."[35] This is another aspect of Chiang's critique of auto-poiesis as an ideal, in that the push for totally self-sufficient automatons only results in their transformation into profoundly toxic, asocial beings (as happens, in my view, with humans who are wedded to a self-optimizing, Promethean ideal).

A CASE STUDY: SOVIET CYBERNETICS AND TSETLIN'S COLLECTIVE GAMES OF AUTOMATA

Now that I have analyzed the postapocalyptic and cybernetic elements of *The Lifecycle of Software Objects*, it is worth moving on to the historical development of cybernetics. I am particularly interested in examining a relatively obscure case study of cybernetic experimentation in the Soviet Union: the mathematician Mikhail Lvovitch Tsetlin's theory of collective games of automata. His theory described an automaton (a mathematical model) of a finite state machine that alters its state according to its transition diagram and the current input. In other words, the automaton was an agent who reacted to an environment which randomly rewarded

32 Chiang, 3.
33 Chiang, 10.
34 Chiang, 18.
35 Chiang, 28.

or punished specific behaviors—it faced an anarchic and inhospitable world. There is no reason to suspect that Tsetlin's experiments in the 1950s and 60s had any direct influence on Chiang. But the prevailing cultural metaphor used by Soviet intellectuals (the metaphor of a moth chased by a bat) to describe the context surrounding Soviet cybernetic systems (exemplified by Tsetlin's "learning automata") is uniquely applicable to Chiang's digients, who themselves can be seen as "learning automata." This gives us a paratextual, historical referent for Chiang's unique and contemporary fictionalization of artificially intelligent beings. The metaphor also aptly evokes the totalizing, opaque atmosphere of power that can be seen in Chiang's novella, because it can be easily applied to the predatory dynamic between Ana and the inscrutable Absolute she struggles against. By extension, I also believe the late-Soviet metaphor to be especially relevant to the current epoch of digital capitalism.

In the 2024 article "Cybernetics Across Cultures: The Localization of the Universal," historian Slava Gerovitch describes that American and Soviet cybernetics developed in distinct yet parallel lanes. Their biggest difference was how their practitioners responded to their respective cultural contexts. In the 1950s, Herbert Simon and Allen Newell, the pioneers of American artificial intelligence, "developed the heuristic research approach, which quickly became the dominant paradigm for American AI research . . . problem solving activity consisted in finding a path from the initial to the goal state within the problem space [which looked like] a branching tree or a labyrinth."[36] This heuristic approach, with central metaphors of the labyrinth and branching tree, reflected the Western, capitalist emphasis on the freedom to make choices on a predetermined track. Eventually, Simon and Newell projected this as a universal, ideological "model of intelligence," influencing how activities like the "semi-automatic actions of machine-bound operators in air defence control centres, to chess players' limited repertoire of permissible moves"[37] took shape. In contrast, Soviet scientists initially reacted against the "idealistic" and "mechanistic" tendency of ideologically-circumscribed Western cyberneticians. This reception of American cybernetics continued during Nikita Khrushchev's de-Stalinization efforts in the 1950s, but Soviet interest in American cybernetics was renewed with a fervor. Norbert Wiener, the American progenitor of cybernetics, attended a 1960 conference in Moscow and was received extremely warmly. Following this, the Soviet media began to write about computers as the "machines of communism."[38] Very quickly, Soviet scientists began developing their own heuristics, favoring creative, solution-seeking models which involved "creating a new

36 Slava Gerovich, "Cybernetics Across Cultures: The Localization of the Universal," in *Cybernetics for the 21st Century, Vol. 1: Epistemological Reconstruction,* ed. Yuk Hui (Hong Kong: Hanart Press, (2024), 133. Cybernetics, being the historical progenitor of AI, introduced much of the lexicon we use to talk about artificial intelligence and machine learning today.

37 Gerovitch, 134.

38 Gerovitch, 136-37.

problem space rather than 'pruning useless branches,' [rejecting the heuristic of] the Newell-Simon [tree] model."[39]

Tsetlin created his games in reaction to the totalitarian and oppressive atmosphere in which he lived. In reacting to the arbitrary, opaque, and bureaucratic behavior of his authorities in Moscow's Institute of Applied Mathematics (and in the broader Soviet government), he developed a radically different heuristic of choice. Tsetlin's former student, V.L. Stefanuk, reflects on the bureaucratic tyranny of the Soviet social game (its stifling socio-political atmosphere), describing how "in 1966 the Moscow Institute of Physics and Technology… refused to accept my dissertation [on a cybernetic mobile communication model] without any reason."[40] Gerovitch likewise describes how Tsetlin's theory of collective games of automata reflected the profound uncertainties of Soviet social etiquette: "Tsetlin interpreted an automaton as an agent acting in an environment that randomly penalized or rewarded specific behaviors… [he] studied [mathematical] games in which the automata faced a world filled with uncertainty."[41] As a result of this uncertainty, the players are entirely ignorant of the game's guidelines: "They are ignorant of the number of other players involved . . . and even what kind of game they are actually playing."[42] To go back to Chiang's story, this sense of paralyzing precarity is eerily similar to the situation which Derek and Ana find themselves in—it is almost as if the protagonists are themselves struggling through one of the games Tsetlin theorized. Ana and Derek struggle to understand the arbitrary logic of the market from which they are protecting their digients, and they scramble to find solutions to their digients' obsolescence. Like the Soviet scientists, they feel no sense of control over their (digients') future, and flounder over the lack of moral codes present in the wider digital world in which they are nested (recall the moral dilemma they face over commodifying their digients for humans' sexual pleasure). Chiang even explicitly describes humans' general interactions with the digients at the beginning of the novella as being "like an overly difficult game."[43] Ana and Derek's digients, too, become enamored with a deluge of games and puzzles as the narrative progresses: serial game dramas, racquetball, puzzle games, and racing games. There is a sense of cybernetic recursivity in this game-within-game framework. To go back to Soviet cybernetics, Stefanuk concurs with Tsetlin's model, but also develops it further by proposing that Combinatorial Problems (mathematical puzzles/games) can have "a solution that does not necessarily follow from prior knowledge of the field to which the problem belongs."[44] This is an elaboration of the vision of automata produced by Tsetlin (and

39 Gerovitch, 138.
40 Vadim L. Stefanuk, "From Tsetlin's School of Learning Automata Towards Artificial Intelligence," *Pattern Recognition and Image Analysis* 33, no. 4 (2023): 1255.
41 Gerovitch, 145.
42 Gerovitch, 145-46.
43 Chiang, 15.
44 Stefanuk, 1256.

largely adapted by Chiang), in which the moves and decisions of the automata are not necessarily based on prior knowledge or context—they are based on instinct and intuition, which Ana fully embodies at the end of the novella (and which I discus in the chapter on the moth and the bat), subverting the cybernetic logic of the digital world.

The central metaphor of Soviet cybernetics developed in contrast to the American labyrinth metaphor and its evolved form, the 'rat race' inspired by B.F. Skinner and his experiments on rats running in T-shaped mazes. The metaphor which was used in the context of Soviet cybernetics was inspired by "the behavior of a moth hunted by a bat. When the bat was too close and the moth could not fly away, the moth started dashing around in a chaotic flight."[45] This can be applied to Chiang's story and Ana's attempts to save her digient Jax. In *The Lifecycle of Software Objects*, Ana transcends the arbitrariness of the cybernetic game she finds herself in by rejecting its rules entirely. She figuratively flits around like a moth chased by a bat. Instead of deciding to optimize Jax according to a marketable, exploitative logic, she seeks to give him "fluency at navigating the real world, creativity at solving new problems, judgment you could entrust an important decision to."[46] In other words, she refuses to treat him as a digient, and instead treats him as a real human being—a son—with all of the thorny familial frictions that this relationship entails. She loves Jax in a motherly, sacrificial, and instinctual manner which fundamentally appears irrational to the anarchic, cybernetic logic of the digital world.

THE MOTH AND THE BAT: A REPURPOSED METAPHOR FOR DIGITAL CAPITALISM

Paratextually, I will now argue for the relevance of using the Soviet moth-and-bat metaphor to understand our digital capitalist epoch. I seek to argue that Chiang's novella perfectly illustrates the dynamic of contemporary alienation of human beings in the face of a seemingly totalizing digital, capitalist Absolute. Initially, I will examine the extant metaphors we have to describe the machinations of digital capitalism, and explain the necessity for a new one. Then, I will discuss what I see as being the closest Chiang gets to a prescriptive solution to our digital alienation in the face of the obsolescence of our cherished worlds, that is, a 'retreat into the heart:' motherly love as an antidote to cybernetic logic.

In his 2022 paper "Data Mining on the Crawl Frontier: Metaphor in Cybernetic Capitalism," Timothy Erik Ström says that metaphors "function as a way of

45 Gerovitch, 148.
46 Chiang, 59.

coping with extreme abstractions, to make them seem more tangible, less like apparatuses of alienation, giving them a veneer of familiarity."[47] Metaphors that are used to make sense of capitalism and socialism tend to be zoomorphic, describing relationships of domestication or predation. Similarly, Chiang's digients can be understood as being 'domesticated' by the humans, and later preyed upon by an increasingly indifferent 'swarm' of human consumers. Ström later describes how corporations like Google use predatory metaphors to conceal their "abstracted practices." In other words, they us figurative language and rhetorical flourishes (in advertising, marketing, and user interface design) to hide the concrete reality of their exploitative activities. He comments on the metaphorical image of the spider-like "web crawler" that describes Google's internet bots, which extract data from websites. This process, called 'data mining,' is used to "extract patterns and knowledge from large data sets."[48] As digital subjects, we permit these corporations to employ their own metaphors on their own terms, allowing "the cyber-capitalist corporation [to] firmly control the means of abstraction,"[49] not just determining the economic order, but also influencing how we think about the economic order. But in order to deepen our understanding of the digital epoch independently of the corporate systems, it is worth relating our current condition to the past through a creative repurposing of already-extant metaphors. The system of the late-Soviet Union very much resembles our epoch, in that many governments today can be viewed as equally totalizing as the Soviet bureaucratic apparatus, due to the global capitalist economy, which largely includes monopolizing corporations that function in a similarly opaque and enclosing vein. Like the impersonal bureaucratic entanglements encountered by Tsetlin and Stefanuk, we as subjects of the digital Absolute are victims of the Internet as a similarly impersonal network of control. In Ström's words, the Internet is "a vast interactive realm wherein every action, interaction, and transaction generates information about itself."[50] This is the essence of surveillance: the information we disclose about ourselves is collected and used to control us, through the churning production of more information.

In our epoch, there seems to be no singular antagonist, no outward dictator or regime. As Soviet scientists experienced when Stalin died, the system churned along without a charismatic mask. Subsequently, we as digital subjects have encountered the same death of the charismatic leader figure. It seems that we are ruled, more and more, by lifeless technical information, which takes the form of data we cannot decipher. The problem with the classical American metaphor of the capitalist rat race is that it solely identifies the prey (the rats), who compete against one another in an inscrutable setting. The metaphorical predator (the scientist, in

47 Timothy Erik Ström, "Data Mining on the Crawl Frontier: Metaphor in Cybernetic Capitalism," *Law Text Culture* 26 (2022): 125.

48 Ström, 131.

49 Ström, 131.

50 Ström, 136.

this scenario) is not identified, and remains concealed. Conversely, the problem with Google's metaphor of the "crawling" spider is that its prey is not identified—this can be seen as a unilateral form of propaganda, characteristically obscuring the prey (that is, us), and our own relationship to the arachnid digital Absolute. This is where the metaphor of the bat and the moth becomes more appropriate. Like a moth, we are being identified, tracked, and hunted by the bat of the digital Absolute, through abstract processes we do not understand, such as data mining (which can be compared to echolocation, figuratively speaking). As we flit more erratically, disobeying the logic of the digital realm, we trust our natural instincts more. And the more we evade the bat's inscrutable logic, the higher our chance of survival. In the real world, the bat hunts the moth in the darkness of a cave, an opaque and formless setting which very much mirrors our own dizzying experience of digitality, and interaction online. The moth also resembles one of Tsetlin's theoretical automatons, who is not privy to the rules of the game. In the moth-and-bath metaphor, both the predator and prey are identified, along with the setting in which the race takes place. The metaphor of the bat and the moth is more accurate with its vehicle and more specific to its tenor. And, unlike the other ones, it provides us with the possibility of escape.

CONCLUSION: A RETREAT INTO THE HEART AND THE ETHIC OF MOTHERHOOD

Beginning with a close reading of the cybernetic aspects of Chiang's novella, and moving into a paratextual, figurative understanding of the dynamic of digital capitalism which can be compared to an event in which a moth (us as digital subjects) is being chased by a bat (the totalizing Absolute), we now return again to *The Lifecycle of Software Objects*. I argue that Chiang suggests a tentative solution for confronting digital obsolescence and the dizzying predation of the digital Absolute. This solution is based on genuine love and sacrifice, as the only way to leave behind the repetitive anarchy of Ana and Derek's digital Earth. This is exemplified in the motherson relationship that is established between Ana and Jax, and manifested in her unwillingness to commodify or suspend him. It is clear that Jax is much more than an Artificial Intelligence to her, exemplified by her physical embrace of his robot body.[51] Ana's embrace acts as assurance to Jax that she loves him,[52] and reflects her claim that the only person who can desire keeping 'endangered' digients around is "someone who's a fanatic, someone who's motivated by love. Someone like her."[53] Ana, the 'loving fanatic' of Chiang's story, is akin to the concept of the philosophical 'Idiot' of Byung-Chul Han. Han's 'Idiot' is an archetype who "represents a figure of

51 Chiang, 25.
52 Chiang, 44.
53 Chiang, 59.

resistance opposing the violence of consensus. The Idiot preserves the magic of the outsider . . . [she] is more like a flower: an existence simply open to light."[54] Like Ana and the metaphorical moth, the Idiot is driven by instinct, which subverts the anarchic cybernetic logic of the digital world. Ana cannot exactly grasp or rationalize her innate repulsion towards Binary Desire: "she can't articulate an argument that isn't rooted in personal distaste."[55] However, she knows *a priori* that the optimizing, operational logic of Data Earth is morally wrong. Ana thus challenges the consensus digital reality of her world, which is marked by fluidity and market-based uncertainty, by becoming an Idiot to the cybernetic system of which she herself is part. She is a human individual whose irrational love towards her digient short-circuits the violent churn of digital obsolescence, and allows her to detach from it.

In his 2024 essay "Life-in-formation: Cybernetics of the Heart," Daisuke Harashima describes the way in which digital capitalism gradually degrades information. It first takes life information (information that "brings significance to a living thing"), then it transducts it into social information (information communicated between humans, including gestures, images, words), and finally abstracts it into mechanical information (taking the communicative symbols and stripping them of).[56] The digital world, based on the cybernetic logic that transforms everything into a fluid Absolute, can only communicate with the mechanical information, which is rendered into data. Harashima advocates for a rediscovery of the meaning and value that has been stripped from us in this process by "the technological condition." Similar to Chiang, he situates this ethical movement in interiority, as a: "life-information" of the 'heart.'

We can understand the tragic enclosing of the "autonomous [human] system that constructs the world of significance"[57] by digital capitalism only figuratively—through a metaphor. The image of a bat chasing a moth corresponds to an understanding of digital capitalism as a hierarchical system in which the digital, cybernetic Absolute is preying on an organic, living human being. Harashima argues that "enframing cybernetics conceals the fact that there exists hierarchical autonomy. Hierarchical autonomy makes it obvious that there are two points of view, not one."[58] The metaphor of moth and bat provides us with the freedom to recognize both of these perspectives, that our life and behavior are conditioned by the logic of profit and operability typical of digital capitalism, but also that we can escape this conditioning by taking action based on intuition and empathy. Similarly, Ana can instinctively enact her will to love in spite of what is expected of her. *The Lifecycle*

54 Han, *Psychopolitics*, 83-87.
55 Chiang, 51.
56 Daisuke Harashima, "Life-in-formation: Cybernetics of the Heart" in *Cybernetics for the 21st Century, Vol. 1: Epistemological Reconstruction,* ed. Yuk Hui (Hong Kong: Hanart Press, 2024), 252-54.
57 Harashima, 261.
58 Harashima, 261.

of Software Objects makes us realize that the grip of the digital realm on us is fundamentally illusory. The cybernetic logic of digital capitalism clashes with 'the language of the heart.' More importantly, the story teaches us that we can save ourselves from the bat's maw of digital capitalism by resorting to our 'interiority.'

Chiang's suggested solution for escaping the cybernetic absolute is a retreat into the heart. This might appear anachronistic and at-odds with the ethos of contemporary speculative fiction, as it rejects worldly politics and social collectivity in favor of an inward disposition and intuitively guided actions. It is an ethics of interiority, carrying an almost theological dimension in its language of motherhood and familial devotion. Crucially, it contrasts with the standard offerings of Marxism and its focus on intersectionality: class, race, and gender hardly feature as points of tension in the novella. According to Ana, "Loving someone means making sacrifices for them,"[59] and she lives this out in her surrender to emotions, which amounts to a willful abdication of the global politics of digital capitalism. She vows to "teach [Jax], as best she can, the business of living."[60] She rejects the figurative, surrogate 'parenthood' imposed by the cybernetic logic of capitalism and its anarchic, paternalistic regime. She vows to become a 'mother' in a digital culture which disincentivizes care and compassion, and even forces its digient progeny into sexual commodification. Ana's adoption of Jax is the emotional center of the narrative. The digital realm (that is, the bat) cannot understand this (which appears arcane and old fashioned), and Ana's (that is, the moth's) intuitive flitting becomes a glorious flight into the light of a 'home.' Perhaps Chiang's ultimate message is a didactic one—he celebrates the virtues of the familial and the domestic in a world of digital amorality and obsolescence. Ultimately, *The Lifecycle of Software Objects* reveals itself as a celebration of motherhood, which Chiang seems to imply is facing its own tragic obsolescence. ⊡

59 Chiang, 60.
60 Chiang, 64.

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