Ned Rossiter

44 The Logistical Episteme

Abstract: This chapter probes the technical and infrastructural operations of logistical apparatuses to propose the concept of the logistical episteme. The chapter examines how contemporary power is produced and organized within and through logistical technologies and industries specific to contemporary capitalism. The concept and material condition of the logistical episteme is elaborated with reference to industrial tendencies, geopolitical infrastructures, and technical systems operative within global logistics. In so doing, the chapter builds an account of world-systems reorganized and conditioned as regions by the logistical episteme. The chapter argues that an analysis that begins with the logistical episteme arrives at a considerably different comprehension of geopolitical formations at historical junctures that distinguish the variations of capital in epochal terms. In short, the chapter proposes a media theory of geopolitical formation parsed through the episteme of logistics.

Keywords logistical episteme, cybernetics, capitalism, geopolitics, infrastructure, labor

Increasingly, great swathes of contemporary society and economy are organized logistically, through the power of the episteme. What is an episteme? A concatenation of words and things, institutions and instantiations, energy and enlightenment, centripetal systems and centrifugal forces. An episteme is not simply an abstraction. Nor is it reducible to disciplinary practices or knowledge production. Rather, an episteme organizes. The logistical episteme operates as a grammar of organization, calculation, and movement designed to service capital accumulation. As an organizational architecture that valorizes efficiency, the logistical episteme structures relations within regimes of near real-time.

This chapter probes the technical and infrastructural operations of logistical apparatuses to propose the concept of the logistical episteme. The motivation here is to conceptually discern and empirically substantiate how contemporary power is produced and organized within and through logistical technologies and industries specific to contemporary capitalism. The chapter elaborates the logistical episteme against this backdrop with reference to industrial tendencies, geopolitical infrastructures, and technical systems operative within global logistics. In so doing, I build an account of world-systems reorganized and conditioned as regions by the logistical episteme. I argue that an analysis that begins with the logistical episteme arrives at a considerably different comprehension of geopolitical formations at historical junctures that distinguish the variations of capital in epochal terms. In short, I propose a media theory of geopolitical formation parsed through the episteme of logistics.[1]

1 A model reference in this regard is the work of Mattelart and Mattelart (1992).

https://doi.org/10.1515/9783111316857-044

Epistemology of Cybernetics

With a prehistory in the science of cybernetics, the logistical episteme is a material condition that modulates institutional discourses, industrial objectives, cognitive tendencies, and social experiences. As the anonymous collective Tiqqun maintain in their text on the cybernetic hypothesis, "digital culture" is underpinned and politically conditioned by the "cybernetic episteme" (2020, 9). For Claus Pias, it is "only when humans and machines operate on the same digital basis, when the knowledge of humans and that of machines can be made compatible, that the epistemology of cybernetics is itself able to be productive" (2016, 16). The digital, in other words, is the operative foundation, the logic of equivalence, that flattens differences, eradicating externalities and contingencies through the computational process of interoperability. This is a media-technological function and imaginary predicated on mathematical calculations specific to the digital. What Wolfgang Ernst calls "the operativity of data processing (synchronization)" produces technical artifacts "mathematically operated by symbolic codes and streaming data" (2013, 70).

But all of this assumes technologies of interoperability enabled by interactions between computer hardware and software persist without interruption. Here, a distinction needs to be made between cybernetic epistemology and cybernetic operations. A model of cybernetics can demonstrate how techniques of quantification proceed in recursive ways. Such is the epistemological seduction of cybernetics. However, at the operative level, contingencies and externalities register as material perturbations that make cybernetic machines inoperable. What I call the logistical episteme is an extension of the social and economic integration of biopolitical modes of governance through cybernetic techniques. In other words, the logistical episteme includes and incorporates epistemologies of cybernetics, which is to say ways of knowing registered at the human-machine interface that actions worlds. As media philosopher Yuk Hui notes, "it is undeniable that cybernetics has laid an epistemological foundation for modern automation" (2024, 15). By contrast, the status and force of an episteme indexes a wider constellation of relations that condition historical conjunctures in the semblance of unity, of totality, of a system with more or less identifiable borders.

The cybernetic episteme stretches back to the years prior to World War II when private organizations such as the Rockefeller Foundation and Ford Foundation identified a need for, and subsequently funded, interdisciplinary research able to develop techniques and methods informed by and attentive to the laws of networked machines (Geoghegan 2023, 21–29). The logistical episteme builds on this historical condition and transmutes it into an operable world-system distinguished by new regional formations mired in geopolitical and geoeconomic contests of power.

Like Foucault, Hui considers the episteme as 'a *dispositif*,' albeit one which:

> in the face of modern technology, may be reinvented on the basis of the traditional metaphysical categories in order to reintroduce a form of life and to reactivate a locality. Such reinventions can be observed, for example, following the social, political, and economic crises that occurred in each

> epoch in China (and we can surely find examples in other cultures): the decline of the Zhou Dynasty (1122–256 BC), the introduction of Buddhism in China, the country's defeat in the Opium Wars, etc. At these points we observe the reinvention of an *episteme*, which in turn conditions aesthetic, social, and political life. The technical systems that are in the process of forming today, fuelled by digital technologies (for example, 'smart cities,' the 'internet of things,' social networks, and large-scale automation systems) tend to lead to a homogeneous relation between humanity and technics—that of intensive quantification and control. But this only makes it more important and more urgent for different cultures to reflect on their own history and ontologies in order to adopt digital technologies without being merely synchronized into the homogenous 'global' and 'generic' *episteme.* (2016, 31)

Hui posits the notion of a cybernetic episteme coemergent with digital technical systems. Hui implies an epistemic arrangement more expansive than the cybernetic episteme insofar as he invokes the possibility of multiple epistemes, of apparatuses that order modes of life specific to "the question of locality." His book *Art and Cosmotechnics* concludes with a plea for and declaration of an "epistemic revolution," one that "is always already *local* and *historical*" (2021, 287). Whether the spatial unit of the local holds primacy is open to further interrogation and investigation, which I will return to in the final section of this chapter. Hui's central intervention, however, is significant. Namely, that an episteme is not reducible to technologies of synchronization, or what I call interoperability in the case of the logistical episteme, that produce a universal condition of social-technological homogeneity. Such synchronized indistinction comprises the 'cybernetic hypothesis,' against which Tiqqun foment their critique. But in a sense, this is a false critique within the current conjuncture insofar as the logistical episteme is more expansive than social life subject to technologies of synchronization. Yet the pervasiveness of the logistical episteme is not totalizing. Rather, it is underscored by heterogeneity and contradiction, operativity and inoperativity.

Whatever the digital is, it has multiple determinations. To reiterate, a distinction needs to be made between cybernetic epistemology and cybernetic operations. If the former purports to flatten differences and eradicate externalities or contingencies, the latter shows that such things can never be accomplished. In fact, the mess of cybernetic operations is precisely the condition, and not just the malfunction, of cybernetic epistemology. To be clear, then, inoperability is not the failure of operation. In fact, there is no operation without it.

The crisis from which an epochal episteme emerges is not ubiquitous in scope nor uniform as experience. The variability of crisis, of crises that manifest in a multiplicity of ways, as polycrises or even permacrises, is generative of epistemes, which, while broad in their reach, are nonetheless distinguished by borders coincident, for Hui, with cosmological horizons infused with cultural tendencies, traditions, and predilections—"a collective aesthetic experience of an epoch and a locality (its cosmos)" (2021, 25). Hui considers these emergent epistemes as "fragmented" and "deterritorialized" (282). The logistical episteme shares this feature of fragmentation. It is less deterritorialized, however, than generative of new territorialities immanent to operational logics of technology and infrastructure (Rossiter 2017). In theory, the logistical episteme,

which similarly emerges from and is conditioned by historical junctures of crisis, overlaps with geopolitical and geoeconomic spatialities that Sandro Mezzadra and Brett Neilson (2024) analyze in terms of multipolarity and centrifugality. What follows is a preliminary typology of elements that comprise the logistical episteme, constituting, among other things, new regional spatialities.

Elements of the Logistical Episteme

The logistical episteme is comprised of multiple elements or component parts. Each have their unique properties and propensities, yet they may also combine and intersect to constitute an interoperable system. Here, we are reminded of Foucault's concept of the episteme, which operates in some ways like a database, drawing down on select inputs that comprise the universe of what might also be considered a provisionally closed system: "during an interview in 1977, around the time of the publication of the *History of Sexuality*, Foucault proposed to define episteme as a form of *dispositif:* as that 'strategic *dispositif* which allows the selection, among all possible enunciations, of those that will be acceptable within [...] a field of scientificity of which one can say: this is true or false'" (Hui 2016, 31). The operativity of the logistical episteme is similarly determined by rules, the rules in this case of capital accumulation that ask: Is this recombination of supply chains, computational routines, institutional practices, and so on and so forth likely to generate a profit or not? At a base level, the logistical episteme is the governance of metrics by other means. Foucault analyzed clearly the governance of "statistical populations" as a key feature of modern biopower and "science of the state" (Foucault 2007, 100–101). I take this statistical governance to also include computational and calculative techniques for managing complex systems, of which logistical infrastructures are paramount.

The extent to which interoperativity is possible comes down to the power of standards and protocols, the kernels of a computational architecture that functions as the meta-layer or topological skin that binds the surface of otherwise discrete parts. Understood as a grammar of organization within the topos of linguistic semiotics, the key elements of the logistical episteme proceed in ways similar to the relation between *langue* and *parole* (see Geoghegan 2023, 94 and 103). The former consists of the general language or rules of a system, while the latter is the enunciative performance made possible by this overarching grammar of organization. *Parole*, in Saussure's sense of the term, has to do with the use of the episteme and not just its abstract structure. Within this schema, a materialist theory of the logistical episteme can be elaborated.

When different elements of the logistical episteme combine, interact, and diverge, the episteme of logistics is produced as a meta-system. At this moment, the logistical episteme asserts its greatest power, a power specific to its logic of operation across a territoriality produced within the space and time of logistical operations. Needless to say, machines are material entities not equivalent to the human form of living labor, which, while articulated with contextual situations and extensions of machines and en-

vironments that govern, is in itself demarcated in socially, culturally, economically, and historically distinct ways. Such is the limit of analogy, where a continuum of relations supposes everything connects with everything (Pasquinelli 2023). The cold sword of the digital is, if nothing else, precise as a technology of switching. I will now break down the logistical episteme into its key elements that, in spatio-temporally variegated ways, coalesce as a tapestry of world-historical force.[2]

Computational Organization

Protocols are the technical rules of digital communication. Standards index institutional and industrial agreements that formalize protocols, ensuring that capital has markets connected by reproduceable commodity forms in communication through processes of exchange and interaction. Protocols and standards are the foundations of platform interoperability. However, these techniques of governance offer no guarantees. In other words, they do not ensure market growth, expansion, or competition. Contingency always haunts the assumed hegemony that attends interoperability. Manifesting as inoperability, contingency takes many forms: technical breakdowns and glitches, labor strikes, environmental catastrophe, inventory blow-outs, supply chain disruptions, border conflicts, and the like. Inoperability is the outside of logistical interoperability.

Infrastructural Organization

Data centers, airports, warehouses, shipping ports, energy grids, intermodal terminals —these are among the core infrastructural facilities that populate the territory of logistics. The infrastructural elements of the logistical episteme are frequently located in peri-urban regions. Internet cables and electricity grids, on the other hand, may produce transborder connections not limited to the territorial borders of nation-states or even ethno-cultural and historical regions. Spatio-temporal dynamics are specific

2 On the nomenclature of elements vis-à-vis cybernetics, see Pias on Macy conferences: "McCulloch, who arranged the elements of cybernetics as though drawing up a precise blueprint" (2016, 13), and "This effort to design new orders of knowledge—within which heterogeneous elements could tentatively be arranged and in which the borders could tentatively be eliminated between man and nature, man and machine, subject and object, *psyche* and *techne*—was referred to by McCulloch as an 'experimental epistemology'" (19). See also Ernst Kapp, *Elements of a Philosophy of Technology* (2018), and John Durham Peters, *The Marvelous Clouds: Towards a Philosophy of Elemental Media* (2015). Wolfgang Ernst's various writings on media-archaeological analysis canvas the idea of elements that comprise the atomic level of material surfaces (*Digital Memory and the Archive* 2013, 73). "When media themselves become active archaeologists of data, the cold gaze of the machinic eye is an element in cybernetic feedback systems" (59).

to each of these infrastructural forms. Combined, they produce complex territorial layers and assert modes of power peculiar to their operational logics.

Politico-Juridical Organization

The computational dream of politics is to program outcomes. Infused with ideological predispositions, the politico-juridical layer of the logistical episteme consists of legal standards, institutional settings, and inter-state alliances held captive by Silicon Valley and its Chinese counterparts in Shenzhen and Zhongguancun. Where politics seeks control defined by the seemingly unambiguous territorial borders of the nation-state, the border also instantiates "the contingency of the state's authority and control over the spatial domain which lends to it the title of statehood" (Samaddar 1998, 20). How might we elaborate a more expansive concept of politics that takes into account the borders, the limit horizon, of the episteme as it figures through circuits and technologies of global logistics? Such an undertaking includes an analysis of the politics of parameters, of the ideology of code, and the inscription of computational grammars on the surface of human expression.

Industrial Organization

How does the logistical episteme organize industrial sectors? Enhanced efficiencies, optimization of performance, granulated systems of measure, disaggregated and reaggregated reserves of labor power, just-in-time modes of production and distribution, just-in-case anticipations of unforeseen disruptions. These are among the core features of industrial techniques enlisted to expand the wealth of capital and extract value from the social layer of the logistical episteme. The financial layer combines with the infrastructural layer of data centers to make possible technologies such as high-frequency trading, which in turn affects logistical calculations and technologies of measure used within shipping industries and supply chains in which market forecasting and speculations on delivery times are routine (Neilson and Rossiter 2011).

Financial Organization

The logistical episteme is heavily entwined with finance capital. From the infrastructural speed of high-frequency trading in which millions of transactions are parsed automatically through algorithmic decisions to the speculative cultures that infect market dynamics (Golumbia 2013; MacKenzie 2021), financialization is another primary element of the logistical episteme. Data centers and fiber optic cable networks provide the infrastructural backbone to capital accumulated at the speed of light (Tiessem 2012; Starosielski 2015; Rossiter 2017; Edwards, Cooper, and Hogan 2024). Moreover, cy-

bernetic thought precedes the infrastructural form of financialization enabled by data center assemblages (see Mosco 2014, 22–32; Halpern 2014). Yet, not everyone agrees on this point. Historian and philosopher of economics Philip Mirowski (2013) distinguishes between neoliberal thought, which has been key to the intensification of the 'financialization of daily life' (Martin 2002), and computational systems that accelerate and network financial transactions: "If I had to summarize where the otherwise prescient Foucault took a wrong turn, it was in too readily swallowing the basic neoliberal precept that the market was an information processor more powerful and encompassing than any human being or organization of humans" (Mirowski 2013, 98). Certainly, markets are not the same as information processing machines. Except that with the emergence of the cybernetic episteme in the 1930s, coincident with *ordo*-liberalism, we find the basic conceptual and theoretical coordinates in place that, when carried through to the present, operationally function *as if* not just the market but the world was an information processor. At the earlier stage, however, the cybernetic episteme is but a blueprint of what is later operationalized and consolidated in the 2000s as the logistical episteme—a material condition affecting subjectivity and cognition, society and culture.

Examining the work of Friedrich von Hayek and the notion of 'strategic ignorance' as a central feature of rational economic knowledge about and institutional actors associated with the 2007–2008 global financial crisis, William Davies and Linsey McGoey (2012, 67) argue that "neo-liberalism was born as a deeply sceptical epistemological and political attack on the possibility of centralized knowledge." Here, one might ask whether by definition an epistemology and, more specifically, an episteme can even be contained or overseen by centralized knowledge. Epistemology might better be understood as a distributed system of organizing knowledge that is by definition decentralized. This structural feature does not in and of itself make epistemology amenable to the institutional and policy interests of a neoliberal paradigm, which after all is centralized as a mode or organization in many regards despite an ideology that valorizes the decentralization of authority and decision-making (Koning 2018; Slobodian 2018). Or rather, as noted by political economist Martijn Koning (2015, 71), contemporary capitalism "is characterized by a fully paradoxical simultaneity of centralization and decentralization, social integration and individuation." The figure of the state, for example, looms large in terms of how policies of privatizing state services are managed and implemented, and activity in the private sector is substantially and frequently supported financially, legislatively, and legally by the state.

The very idea of a Neoliberal Thought Collective (NTC), as Mirowski (Thorne 2019, 184) terms the group of intellectuals mobilized around market liberalization and opposed to state intervention (Harvey 2005), is suggestive of the relation between an episteme and organization. As a "shadowy cabal pulling the strings" (Mirowski in Thorne 2019, 183), the NTC orchestrates ideas and actions, personas and persuasion across institutional arrangements and dubious agencies, funding often nefarious activities in the coordinated pursuit of maximizing particular benefits and designing preferred outcomes from real or manufactured crises. It's all about stitching up the deal. Calculation

is key to financialization. The logistical episteme shares this feature of determining value as a gambit parsed through decision-making machines.

Social Organization

Labor is never precluded from the production of value, no matter the fervor of declarations about the end of work and automation of jobs. The abstraction of high-frequency trading (HFT) might be considered an exception, one in which algorithmic systems of exchange account "for more than 50 percent of the present traded volume in US stock exchanges" (Banerjee and Roy 2023). But even in the abstracted world of HFTs, a social layer prevails in the form of financial regulations and agencies, trading firms, engineers and technical maintenance staff, data centers and cable engineers, market analysts and, lower in the hierarchy of stock market activity, the ordinary day-traders chasing a buck. Such is the environment of labor power that attends the abstraction of computationally generated systems of finance capital.

Historically, labor power conditions systems design and structural logics of capital. It does so by inputting or withholding skills and knowledge from processes of production and supply of services. Pending the power of organization, living labor forces the hand of management to devise new techniques that optimize the performance of work. This includes technology design and the engineering of parameters that determine how work is governed and measured. Labor power, however, is only as strong as its capacity to self-organize. This is how labor asserts itself as force in the social production of value. Within the grammar of measure and codification as data that govern the social layer of the logistical episteme, labor is made equivalent to the spectrum of inputs that combine as a dynamic whose contours distinguish the variability of capital across time and space. Precarity is all too often the common condition of labor splintered and multiplied into units of input and subtraction in the logistical episteme of contemporary capital (Neilson and Rossiter 2005; 2008). Class formations and racial divisions of labor are modulated in tandem with the operative logics of the logistical episteme.

As a system of organization underscored by the production of value, the logistical episteme is not separable from living labor. In Marxian terms, the logistical episteme is inscribed in heterogeneous ways by the 'general intellect' (Virno 2001; Dyer-Witheford 1999; Hardt and Negri 2000). Collective and distributed modes of knowledge are "embodied in machines, instruments of measurement, and *Kulturtechniken*" (Pasquinelli 2023, 103). The general intellect, in other words, conditions the social production of value expropriated by capital (Terranova 2009). Yet the performance of work can also be refused, withdrawn from circuits of valorization. Inoperability always butts up against and haunts the intelligence of technical systems engineered to support the operations of capital. Shared across the social body, the general intellect "becomes the actual foundation of all praxis" (Virno 2001). Conceived as such, the general intellect contests the division of labor epitomized by Fordist modes of production in which labor is atomized and class distinctions are reinforced. However, contemporary capital

extends if not abandons such modes of production and social organization, at least since the 1973 oil crisis and the advent of now ubiquitous post-Fordist logics of capital.[3]

Increasingly, the social body of the general intellect is absorbed into and constitutive of machinic operations of capital accumulation. Such a condition renders the capacity for autonomy and the possibility to institute forms of social relation unencumbered by capitalist processes of production and the expropriation of value difficult to manifest as political praxis. The cybernetic intersection between labor and machine, among various elements that constitute the logistical episteme, requires thinking beyond the Marxian labor theory of value, even if this is now "mediated by machinery" (Pasquinelli 2023, 99). Matteo Pasquinelli distills this diagram of relations succinctly when he writes, "any machinic interface with labour is a social relation, as much as capital" and "the machine, as much as money, mediates the relation between labour and capital" (99).

By contrast, the logistical episteme registers a machinic theory of value. As a complex and historically contingent system, the machinic apparatus or *dispositif* comprises a diagram of relations in which the production of value cannot be reduced simply to inputs and outputs, to the cost of labor indexed in the pricing of commodity forms. In short, a labor theory of value is not sufficient in analyses of contemporary capital. Rather, a machinic theory of value needs to be devised to make intelligible how value is generated and, importantly, accounted for by technical systems of measure, quantification, and recombination.[4] A complex and distributed array of variables crystalize, however fleeting and momentarily, as exchange value. Yet exchange value holds an inverse relation to the heterogeneity of the general intellect and the multiplicity of elements that coalesce as the logistical episteme. Paolo Virno (2001) retains a political potential for the general intellect: "they are not units of measure; they constitute the immeasurable presupposition of heterogeneous effective possibilities." And: "the general intellect comprises knowledge, information and epistemological paradigms, so it also sharply differs from the real abstractions typical of modernity that embodied the principle of equivalence" (Virno, 2001).

It is difficult to understand the 'general intellect' independent of 'real subsumption' as distinct from 'formal subsumption.' Social relations are central to both of these labor processes in relation to capital. Formal subsumption coerces labor and

3 The models for such a social transformation were, as noted above, in place decades earlier from the 1930s when research into cybernetics started to be funded. We can also note Foucault's research on *ordo*-liberalism as the intellectual and political foundation later consolidated as neoliberalism and its various techniques of governing society and economy. See Foucault (2008).

4 While I am not in agreement with Mirowski in his spurious critique of contemporary Marxist activist-scholars such as Hardt and Negri as indulging in "ineffectual posturing and thinly veiled neoliberalism," he is on point in this comment: "What is needed is a concurrent admission that historical materialism, the labor theory of value, and a monolithic 'capitalism' as mode of production are all dispensable as concepts, so that analysis can start over with something that can ruthlessly hollow out neo-liberalism from within, similar to the way that the NTC [Neoliberal Thought Collective] gutted Marxism" (Thorne 2019, 183).

the heterogeneity of production to wage-labor and technologies of command under historical conditions of primitive accumulation. Real subsumption, by contrast, radically transforms the mode of production. Consider, for example, the ways in which intelligence is distributed across a network of human-machine relations. Under such technological conditions—what nowadays goes by the monikers of 'platform capitalism,' 'cognitive capitalism,' and the like—all social activity is a site for the production of 'relative surplus value.' These were the two key insights Negri made in the 1970s, notably in his book *Marx Beyond Marx: Lessons on the Grundrisse* (1991), and the essays collected in *Books for Burning* (2005), especially "Crisis of the Planner-State." Mario Tronti (2019), Tiziana Terranova (2022), and others within the Autonomist movements pursued this inquiry, one that continues with current generations, through notions such as the social factory and the social production of value.

The critical question that emerges within the conjuncture I have been describing in this chapter is: What is the relationship between the logistical episteme and real subsumption? In the *Labor of Dionysus* (1994, 15), Hardt and Negri write: "In the phase of the real subsumption, capital no longer has an outside in the sense that these foreign processes of production ["the leftovers from the pre-capitalist era"] have disappeared." Certainly, and like the idea of intelligence distributed across networks, subsisting as a common, there is a latent potentiality that precedes the capitalist expropriation of value. However, within the logistical episteme, an outside persists as a constitutive force that is radical inasmuch as it retains a disjunctive form incommensurable with the protocological regimes of logistics while also asserting a power precisely through logics of inoperability that are the very condition of possibility for the interoperability necessary for the functioning of logistical systems. This oversight by logistics arises because logistics can only see itself in its own image, which is that of a vast machine of calculation and measure, coordination and control. Anything that does not conform to this narcissistic gaze of logistics is, therefore, outside its ocular regime.

Can we envision a radical horizon, an absolute outside, constituted within the "new, properly capitalist forms" specific to the logistical episteme? (cf. Hardt and Negri 2011, 142; Fuchs 2018). In other words, might "the destructive violence of crisis" (Negri 2005, 1) manifest within the logistical episteme "with the urge that drives towards the adoption of a new historic form"? (Marx, cited in Negri 2005, 1). And if so, then what might we identify as the core features, properties, and propensities of this new historic form? In this chapter, I am suggesting this new form is an apparatus to which we might give the name of the logistical episteme. Any number of forms, expressions, and practices are subsumed by the organizing power of the logistical episteme. Yet there are also fissures of radical alterity and incommensurability that refuse to adhere to the font of the logistical episteme.

Herein lies the paradox of the logistical episteme: at once, a grammar whose operative logic at the computational, infrastructural, political (policy, legal), industrial, and financial layers is predicated on the principle of equivalence as registered in the imaginary and technical logic of interoperativity; yet, at the social layer, the logistical episteme presents as a theater of sacrifice in which value generated by the expres-

sive capacity of the general intellect is expropriated by capital, while also withholding from the force of total subsumption by capital. The expressive capacity of the general intellect, in other words, is not reducible to regimes of equivalence that define logics of interoperability specific to the logistical episteme. Such a perspective reproduces an isomorphic analytical approach, one that proceeds through homologies where everything is equivalent within a flat ontology of relations (see Pasquinelli 2023). The materiality of things means that borders and divisions define the political as the instantiation of struggle around logics of difference. The environmental layer of the logistical episteme further complicates and contests the command and control impetus carried over from the cybernetic episteme into the logistical episteme.

Environmental Organization

Contingency and entropy, crisis and catastrophe. These are the underlying conditions that prevail with increasing frequency in what we might call the long durée of the Anthropocene. But there is a paradox within this conceptual term and industrial-geological condition, one that posits the planetary as a political subject (Osborne 2024), where 'nature' or 'the world' takes revenge. By contrast, and as noted by Fuchs (2018, 458), "In *Marx Beyond Marx: Lessons on the Grundrisse,* Negri (1991, 121) speaks of 'the real subsumption of world society under capital' and says that in the passage from formal to real subsumption, capital becomes 'a real subject'." Such perspectives are countered by those that attribute the human subject with primacy as the historical agent whose interventions principate a world in which 'nature' is ravaged by the structural and ideological pact between 'humans' and the intensification of capitalism as the dominant paradigm of social and economic organization. An environmental political critique can be found by shifting the analytical axis to foreground capitalism as a world-ecology (Moore 2015), for example, or writing an ecological history of state formation (Harrell 2023). But these are just a couple of possible options for alternative perspectives that come to mind.

The grammar of computational interoperability common to cybernetic and logistical epistemologies is one that subsumes the performance of labor as value into machinic operations.[5] Yet such a grammar and operativity is also confronted by entropic dynamics of environment. The disruptive force of environment is not necessarily asserted simultaneously, indeed perhaps rarely at all. Otherwise, the temporal axis of epistemic elements would function as a vector of equivalence. Rather, the entropy of environment organizes relations in ways that radically flip the logistical episteme from a grammar of interoperability and equivalence enabled by computational and infrastructural

5 Virno (2001): "the so-called 'second-generation autonomous labour' and the procedural operations of radically innovated factories such as Fiat in Melfi show how the relation between knowledge and production is articulated in the linguistic cooperation of men and women and their concrete acting in concert, rather than being exhausted in the system of machinery."

protocols and standards into a nascent grammar of inoperability figured by environmentality as an inchoate articulation of governance.

The environment performs as a 'living prototype' against which the logistical episteme is cast as an adaptive system of organization (Keto, cited in Bowker 1993). The material exigencies of environment force the logistical episteme to pattern the world as a dialectic between command and control and contingency and entropy (cf. Bowker 1993, 110). This is what makes the subject of the logistical episteme so delirious: Populations are harnessed as labor power, their expressive capacity subsumed by processes of datafication. Yet the milieu in which labor is situated is an environment that includes machines and living organisms. Subjugation is never total. As such, systems of control are in perpetual flux between states of relative equilibrium and entropic disequilibrium (Luhmann 1995). The logistical episteme is similarly defined.

World-Systems Organization

To what extent can we understand the logistical episteme as a world-system? A world-system is not to be confused with something like Benjamin Bratton's (2015) totality of integrated planetary stacks. Nonetheless, the logistical episteme organizes the world-as-system, albeit one not conforming to spatial models of center and periphery that are the hallmark of analyses on geopolitics and geoeconomics by Immanuel Wallerstein (2004) and others. When coupled with logistical infrastructures, software systems, management discourses and practices, finance and commodity markets, labor routines and rebellions, the logistical episteme shares something with world-systems theory insofar as it accounts for dynamics of interoperability, connection, distribution, and power that manifest expansively across spatial scales and temporal patterns. Yet unlike world-systems theory, the logistical episteme is not limited to a multidisciplinary perspective that critically explains how geopolitics and geoeconomics are comprised of spatial contests of power between and across states. And while the logistical episteme is "always already historical," it is by no means assured of its locality, a necessary feature Hui invests faith in as a condition of possibility for what he calls an "epistemic revolution." With its constant switching and rerouting of supply chains, always responding to contingencies, the logistical episteme flips with such frequency between temporalities of speed and stasis that valorization of the local is rarely possible in any assertive capacity. Movement, flows, circuits. These are the key spatio-temporal tropes of the logistical episteme.

The dominant layer of the logistical episteme organizes markets and institutions, society and culture through the grammar of computation. Yet as I have elaborated above, such a universe of interoperability and interpellation where human expression assumes a digital foundation is never assured. Rather, uncertainty and disruption prevail as the constitutive outside, one that is distributed across the social layer of the logistical episteme. As much as the logistical episteme spatially reorders the world in its own image in which the borders of the logistical episteme assert a sovereign power

that traverses states and nations, social and economic life, so too does the logistical episteme tarry with its negative, namely the surfeit of expression not captured by the power of protocols yet nonetheless generative of the logistical episteme at the level of reproducibility. Such expression takes many forms. Undocumented migration across borders is one example in which surplus populations impact on labor regimes in target countries and the production or depletion of resources necessary for the maintenance of social life and economic activity. The movement of populations through informal and formal circuits of migration is a core element of the logistical episteme that bears upon the production of space and time and, in so doing, constitutes a world-system comprised of new regional formations in which spatialities are configured by the power of infrastructure, software, and labor as distinct from inter-state alliances or civilizational cultures.

Conclusion: Geopolitical Media Theory

Geopolitical media theory at the current conjuncture is media theory conditioned by the logistical episteme. Software, infrastructure, labor. These three primary pillars cast logistical industries into new geopolitical constellations of power. From these empirical, political economic, and social foundations emerge the key coordinates of a media theory that makes intelligible contemporary geopolitics and operations of capital. Inspired by the motivating aims of the Macy conferences on cybernetics in the 1950s (see Pias 2016, 13), I have proposed in this chapter the contours of a blueprint or outline for a media theory attuned to the systemic yet variegated force of the logistical episteme. In this regard, the logistical episteme reproduces what Pias recounts of the psycho-social group dynamics of the Macy conferences: the "epistemological shifts of the cyberneticists were governed by details—by blinks of the eye, intonations, and gestures" (14). Communication is at the core of cybernetic epistemology. Similarly, communication is key to the logistical episteme. The logistical episteme furnishes cybernetics with material forms of operation conditioned by malfunction and misfeasance, contingency and calculation. In so doing, the logistical episteme maintains a mathematical grip on a world that never surrenders to control, yet is reproduced by its techniques of organization.

References

Banerjee, Anirban and Prince Roy. 2023. "High-Frequency Traders' Evolving Role as Market Makers." *Pacific-Basin Finance Journal* 82. https://doi.org/10.1016/j.pacfin.2023.102184

Bowker, Geofrey. 1993. "How to be Universal: Some Cybernetic Strategies, 1943 – 70." *Social Studies of Science* 23 (1): 107 – 127.

Bratton, Benjamin. 2015. *The Stack: On Software and Sovereignty.* MIT Press.

Davies, William and Linsey McGoey. 2012. "Rationalities of Ignorance: On Financial Crisis and the Ambivalence of Neo-Liberal Epistemology." *Economy and Society* 41 (1): 64 – 83.

Dyer-Witheford, Nick. 1999. *Cyber-Marx: Cycles and Circuits of Struggle in High Technology Capitalism.* University of Illinois Press.

Edwards, Dustin, Cooper, Zane Griffin Talley, and Mél Hogan. 2024. "The Making of Critical Data Center Studies." *Convergence* 0 (0). https://doi.org/10.1177/13548565231224157

Ernst, Wolfgang. 2013. *Digital Memory and the Archive.* University of Minnesota Press.

Foucault, Michel. 2007. *Security, Territory, Population. Lectures at the Collège de France, 1977–1978*, trans. Graham Burchell. Palgrave Macmillan.

Foucault, Michel. 2008. *The Birth of Biopolitics. Lectures at the Collège de France, 1978–1979*, ed. Michel Senellart, trans. Graham Burchell. Palgrave Macmillan.

Fuchs, Christian 2018. "Universal Alienation, Formal and Real Subsumption of Society Under Capital, Ongoing Primitive Accumulation by Dispossession: Reflections on the Marx@200 Contributions by David Harvey and Michael Hardt/Toni Negri." *tripleC: Communication, Capitalism & Critique* 16 (2): 454–467.

Geoghegan, Bernard Dionysius. 2023. *Code: From Information Theory to French Theory* Duke University Press.

Golumbia, David. 2013. "High-Frequency Trading: Networks of Wealth and the Concentration of Power." *Social Semiotics* 23 (2): 278–299.

Halpern, Orit. 2014. *Beautiful Data: A History of Vision and Reason since 1945.* Duke University Press.

Hardt, Michael and Antonio Negri. 1994. *Labor of Dionysus: A Critique of the State-Form.* University of Minnesota Press.

Hardt, Michael and Antonio Negri. 2000. *Empire.* Harvard University Press.

Hardt Michael and Antonio Negri. 2011. *Commonwealth.* Harvard University Press.

Harrell, Stevan. 2023. *An Ecological History of Modern China.* University of Washington Press.

Harvey, David. 2005. *A Brief History of Neoliberalism.* Oxford University Press.

Hui, Yuk. 2016. *The Question Concerning Technology in China: An Essay on Cosmotechnics.* Urbanomic.

Hui, Yuk. 2021. *Art and Cosmotechnics.* University of Minnesota Press.

Hui, Yuk. 2024. "Why Cybernetics Now?" In *Cybernetics for the 21st Century: Volume 1, Epistemological Reconstruction,* ed. Yuk Hui. Hanart Press.

Kapp, Ernst. 2018. *Elements of a Philosophy of Technology,* ed. Jeffrey West Kirklwood and Leif Weatherby, trans. Lauren K. Wolfe. University of Minnesota Press.

Konings, Martijn. 2015. *The Emotional Logic of Capitalism: What Progressives Have Missed.* Stanford University Press.

Konings, Martijn. 2018. *Capital and Time: For a New Critique of Neoliberal Reason.* Stanford University Press.

Luhmann, Niklas. 1995. *Social Systems*, trans. John Bednarz, Jr. with Dirk Baecker. Stanford University Press.

MacKenzie, Donald. 2021. *Trading at the Speed of Light: How Ultrafast Algorithms Are Transforming Financial Markets.* Princeton University Press.

Martin, Randy. 2002. *Financialization of Daily Life.* Temple University Press.

Mattelart, Armand and Michèle Mattelart. 1992. *Rethinking Media Theory: Signposts and New Directions*, trans. James A. Cohen and Marina Urquidi. University of Minnesota Press.

Mezzadra, Sandro and Brett Neilson. 2024. *The Rest and the West: Capital and Power in a Multipolar World.* Verso.

Mirowski, Philip. 2013. *Never Let a Serious Crisis Go to Waste: How Neoliberalism Survived the Financial Meltdown.* Verso.

Moore, Jason W. 2015. *Capitalism in the Web of Life: Ecology and the Accumulation of Capital.* Verso.

Mosco, Vincent. 2014. *To the Cloud: Big Data in a Turbulent World.* Paradigm Publishers.

Negri, Antonio. 1991. *Marx beyond Marx: Lessons on the Grundrisse*, trans. Harry Cleaver, Michael Ryan, and Maurizio Viano, ed. Jim Fleming. Autonomedia.

Negri, Antonio. 1995. *Books for Burning: Between Civil War and Democracy in 1970s Italy*, ed. Timothy S. Murphy, trans. Arianna Bove, Ed Emery, Timothy S. Murphy and Francesca Novello. Verso.

Neilson, Brett and Ned Rossiter. 2005. “From Precarity to Precariousness and Back Again: Labour, Life and Unstable Networks.” *Fibreculture Journal* 5. https://five.fibreculturejournal.org/fcj-022-from-precarity-to-precariousness-and-back-again-labour-life-and-unstable-networks/

Neilson, Brett and Ned Rossiter. 2008. “Precarity as a Political Concept, or, Fordism as Exception.” *Theory, Culture & Society* 25 (7/8): 51 – 72.

Neilson, Brett and Ned Rossiter. 2011. “Still Waiting, Still Moving: On Migration, Logistics, and Maritime Industries.” In *Stillness in a Mobile World*, eds. David Bissell and Gillian Fuller. Routledge.

Osborne, Peter. 2024. “The Planet as Political Subject?” *New Left Review* 145. https://newleftreview.org/issues/ii145/articles/peter-osborne-the-planet-as-political-subject

Pasquinelli, Matteo. 2023. *The Eye of the Master: A Social History of Artificial Intelligence.* Verso.

Peters, John Durham. 2015. *The Marvelous Clouds: Towards a Philosophy of Elemental Media.* University of Chicago Press.

Pias, Claus. 2016. “The Age of Cybernetics.” In *Cybernetics: The Macy Conferences, 1946 – 1953. Transactions,* ed. Claus Pias. Diaphanes.

Rossiter, Ned. 2017. “Imperial Infrastructures and Asia beyond Asia: Data Centres, State Formation and the Territoriality of Logistical Media.” *Fibreculture Journal* 29. http://twentynine.fibreculturejournal.org/fcj-220-imperial-infrastructures-and-asia-beyond-asia-data-centres-state-formation-and-the-territoriality-of-logistical-media/.

Samaddar, Ranabir. 1998. *The Marginal Nation: Transborder Migration from Bangladesh to West Bengal.* Sage.

Slobodian, Quinn. 2018. *Globalists: The End of Empire and the Birth of Neoliberalism.* Harvard University Press.

Starosielski, Nicole. 2015. *The Undersea Network.* Duke University Press.

Terranova, Tiziana. 2009. “Another Life: The Nature of Political Economy in Foucault’s Genealogy of Biopolitics.” *Theory, Culture & Society* 26 (6): 234 – 262.

Terranova, Tiziana. 2022. *After the Internet: Digital Networks between Capital and the Common.* Semiotext(e).

Thorne, Christian. 2019. “Conspiracy? What Conspiracy?: A Conversation with Philip Mirowski.” *boundary 2* 46 (1): 179 – 195.

Tiesen, Matthew. 2012. “High-Frequency Trading and the Centering of the (Financial) Periphery.” *Volume* 32. https://archis.org/volume/volumes-archive-on-money-high-frequency-trading-and-the-centering-of-the-financial-periphery-from-volume-32/

Tiqqun. 2020. *The Cybernetic Hypothesis*, trans. Robert Hurley. Semiotext(e).

Tronti, Mario. 2019. *Workers and Capital*, trans. David Broder, forw. Steve Wright. Verso.

Virno, Paolo. 2001. “General Intellect,” trans. Arianna Bove. *Generation Online.* https://www.generation-online.org/p/fpvirno10.htm

Wallerstein, Immanuel. 2004. *World-Systems Analysis: An Introduction.* Duke University Press.