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Kemper, J.

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The Environment and Frictionless Technology: For a New Conceptualization of the *Pharmakon* and the Twenty-First-Century User

JAKKO KEMPER

University of Amsterdam, NETHERLANDS

Abstract

This article aims to contribute to the burgeoning exchange between media theory and the environmental humanities by considering the ecological implications of contemporary digital technology in relation to user experience. It does so by arguing for a reconceptualization of the classic philosophical concept of the *pharmakon*. This concept, which underlines how technology is always simultaneously poison and cure, has been mobilized to assess how human perceptual and sensory capacities are both augmented and curtailed by technology. However, as this article demonstrates through a reorientation of the work of pharmacology's prime philosopher Bernard Stiegler, familiar interpretations of the *pharmakon* exhibit an important shortcoming: such interpretations fail to consider how the ostensibly curative perceptual effects of technology may be supported by the propagation of poison elsewhere. This quandary is argued to be especially pressing in light of the dominant digital design philosophy of frictionlessness: in order to facilitate increasingly convenient user experiences, contemporary technology exploits but also increasingly hides its material conditions of production from view. Underlining the pharmacological ramifications of frictionlessness, the article concludes by suggesting that an environmentally sustainable pharmacology would mean appending the common definition of the digital user with a second definition: the user as a usurping subject whose supposedly frictionless experience is pharmacologically facilitated by and perceptually divested of vast networks of exploitation and environmental destruction.

Keywords

pharmakon, digital technology, frictionlessness, Stiegler, environmental humanities, user

The 2018 project *Anatomy of an AI System* by media scholars Kate Crawford and Vladan Joler charts the global system of extraction that fuels the seemingly frictionless operations of Echo, Amazon's popular brand of smart speakers. *Anatomy of an AI System* shows that the wealth of smooth functions that Echo offers its users – answering queries, playing audiobooks, making Skype calls, controlling room temperature and lighting – is supported by a deeply material underside. This underside is best captured by the project's most evocative feature: an extensive map that depicts the "vast planetary system" of "non-renewable materials, labor, and data" one draws on every time one asks Alexa, Amazon's virtual assistant, to perform an action (Crawford and Joler, 2018). The map portrays, to list but some examples, the hazardous labor of Bolivian and Chilean workers mining the lithium of which Echo devices are composed, the immense quantities of water and energy that are required for constant AI training and the submarine cable infrastructure that undergirds the networked spaces on which Echo relies. Few existing works on Echo communicate so clearly that there is a profound tension between the ostensibly frictionless user experience that this technology affords and the underlying framework of exploitation and extraction that it requires to operate.

Amazon Echo is symptomatic of the contemporary mediasphere, both in its aim to unobtrusively mediate a wide range of human activities and in its highly extractive workings. Whether it concerns smart sensors or one-click ordering, cloud computing or streaming services, virtual assistants or algorithmic recommendation systems – Silicon Valley and other tech hubs envision a world in which the navigation of everyday life is rendered ever more efficient and convenient by technologies that appear increasingly self-effacing. Indeed, as media theorists Olia Lialina and Dragan Espenschied suggest, "most computing power is [today] used in an attempt to make people forget about computers" (2009: 9), configuring digital technology as the impalpable undercurrent that supports human activity. However, as the example of Echo conveys, the computing power expended to make technology disappear from the user's view is deeply material, depending on *and* further expanding systems that exploit labor, extract resources and destroy ecospheres. What we are faced with, then, is a technological condition that is defined by a central tension. On the one hand, the user's experience is directly informed by a vast infrastructure of extractive operations. On the other hand, that same user is increasingly prevented, through the fetishization

of frictionless technology, from attaining any direct sense of the existence of this infrastructure. For this reason, I argue that, in order to understand the most pressing environmental and socio-economic effects of today's digital technologies, we need to think of these technologies in perceptual terms. This means that we must stress that the frictionless perception of the user tends to be made possible only through the simultaneous extension and obfuscation of destructive material processes.

The philosophical concept of the *pharmakon* revolves around technological questions of perception and attention, and I therefore suggest it to be an especially productive concept when analyzing the contemporary mediasphere. The notion of the *pharmakon*, generally associated with Plato, is often used to elucidate how something can be both cure *and* poison, how something can bring destructive effects and bestow benefits in the very same stroke.[1] The *pharmakon* has been a fruitful concept in the study of technology, where it has been used to assess technology's often ambiguous effects – or, more precisely, to evaluate how technology at the same time supplements *and* curtails, augments *and* stifles the user's perceptual, sensory and mnemonic capacities. It is, in other words, a concept that has been mobilized to inquire into the perceptual, cognitive conditions that technology engenders. However, I argue that not all of the productive resources this concept contains have thus far been fully excavated, especially in light of the growing convergence of media theory, the environmental humanities and the study of how technology impacts the Global South. Specifically, I intend to reorient the work of philosopher Bernard Stiegler, whose theory of pharmacology on the one hand provides the most sustained exposition of pharmacological thinking in relation to digital technology, but on the other hand also embodies a shortcoming in how the concept of the *pharmakon* has been taken up. This shortcoming becomes especially pressing in view of today's dominant digital design philosophy of *frictionlessness*.

In this paper, I first give a brief overview of the concept of the *pharmakon*, particularly of the way that Stiegler employs this concept in relation to his wider, technologically oriented theory of human consciousness. I contend that Stiegler and the pharmacological tradition on which he draws present a too narrow conception of the cures and poisons that inform technological perception. I then introduce the notion of frictionlessness as a design philosophy that typifies contemporary digital

technology. Seeking to technologically rid perception of all possible forms of friction, frictionlessness requires a constantly expanding infrastructure of extraction that it inherently must endeavor to conceal. I propose that the material, environmental conditions that inform *pharmaka* and the perceptions they facilitate should be counted amongst the possible poisons and cures of technological assemblages. By invoking Mark B.N. Hansen's critique of Stiegler, I further flesh out my reconceptualization of the *pharmakon* in relation to the condition of frictionlessness. I show that Hansen's critique, while useful, risks neglecting the material dimensions of technology and as such fails to grasp some of the most urgent pharmacological ramifications of today's mediasphere. I conclude by advocating for a new, pharmacological interpretation of the notion of user; the user not simply as one who draws on technology, but also as one who, in doing so, potentially exploits finite and fragile constellations of resources and bodies. Integrating this second definition of the user into the study of technological perception and use cultures brings out the critical significance of the concept of the *pharmakon* today.

Pharmakon

In the *Phaedrus*, Plato stages a dialogue between Socrates and Phaedrus. Plato imagines these two thinkers resting beneath a plane tree on the banks of the Ilisos, enjoying the fragrant summer breeze as they ruminate on a variety of subjects, ranging from the art of rhetoric to Plato's famed Chariot Allegory. For my purposes, it is the myth of Theuth, as recounted by Socrates, that is of interest. The Egyptian God Theuth, so Socrates narrates, brought the gift of writing to the king Thamus. However, instead of simply accepting the gift, Thamus calls attention to the negative effects of this ostensibly positive, beneficial technology. The external aid of writing, so Plato (via Thamus) avers, will serve only to diminish one's mnemonic capacities; becoming reliant on external artefacts will stimulate forgetting and thereby curb the power of one's own mind. In the very movement of externalization, one actively erodes one's own ability to memorize. Thamus declares, moreover, that writing comprises no more than a poor image of the pure immediacy of the "living, ensouled speech" of knowledge (Plato, 2002: 70).

Jacques Derrida, famously critical of such hierarchical accounts of speech and writing, elaborates on this segment of the *Phaedrus* to elucidate how Plato conceives of writing as a *pharmakon*; a cure that is also a poison. Ultimately, for Plato, the *pharmakon* of writing, curative though it may seem, comprises an external, corrosive artifact that nullifies the purity of the subject. Derrida sums up Plato's denigration of the *pharmakon* as follows:

> [T]he pharmaceutical remedy is essentially harmful because it is artificial. […] The *pharmakon* goes against natural life: not only life unaffected by any illness, but even sick life, or rather the life of the sickness. For Plato believes in the natural life and normal development, so to speak, of disease. […] In disturbing the normal and natural progress of the illness, the *pharmakon* is thus the enemy of the living in general, whether healthy or sick. […] [U]nder pretext of supplementing memory, writing makes one even more forgetful; far from increasing knowledge, it diminishes it (1981: 100).

Derrida goes on to deconstruct Plato's denunciation of technical artifice as an external force that corrupts natural life. He stresses, firstly, that the positive and negative potentialities of the *pharmakon* are by default interlinked – one cannot eliminate the one without the other (1981: 103). He demonstrates, moreover, that the supposed externality that Plato ascribes to the *pharmakon* of writing is untenable; how, after all, could this medium affect memory if it were not in some way able to penetrate the human's alleged interiority (1981: 110)?

The French philosopher Bernard Stiegler has further developed the concept of the *pharmakon* as a lens through which to analyze technology. Stiegler underlines that the sharp division Plato draws between *anamnesis* (the purity and autonomy of one's own thoughts) and *hypomnesis* (the artificial memory aid that is writing) is flawed: there is no pure and autonomous thought that is not in some way already caught up in writing (2013: 19-20). What Stiegler's work, furthermore, adds to Derrida's is that it reveals that the structure of the *pharmakon* is not exclusive to writing but rather comprises a general condition of human existence; we are technological beings by default, with sensory, cognitive and affective capacities that are, for better *and* for worse, always malleable by technological prostheses (Stiegler, 1998: 141). This is a

postphenomenological perspective that maintains that experience is always already mediated by technology; technology is not a neutral vessel but rather integral to how humans experience and relate to the world (cf. Rosenberger and Verbeek, 2015).

The constitutive effects of technology on perception are described by Stiegler in terms of *tertiary retention* (2011: 39). With this term, Stiegler supplements Edmund Husserl's seminal model of time-consciousness and its elements of primary retention (direct temporal experience) and secondary retention (memory and imagination) with a necessary third, technological constituent of temporal experience. Husserl emphasized the temporal object of the melody to illustrate his account of temporal perception: perception needs to be able to retain the immediate past and anticipate the immediate future in order to perceive something as a melody instead of as an unconnected string of notes (1991: 37-38). Stiegler insists that this model does not paint the full phenomenological picture: according to him, the technical carriers through which a melody confronts the perceiver constitute an integral part of temporal experience (2009: 54). Specifically, the fact that we can now replay a melody via technical recording media reveals how temporal perception is inherently dependent on technology – this is disclosed, for example, by how our perception of a melody is different the first time we hear it than it is the tenth or hundredth time we hear it (Stiegler, 2009: 53-55). As humans, we rely on technical carriers to mediate our experience, meaning that tertiary retention regulates the interplay between primary and secondary retention.

Stiegler asserts that a crucial consequence of this necessary convergence of technology and experience is that technological *pharmaka* perform a curious double role, insofar as they prove foundational to experience and to the subsequent formation of care and desire, but, in this role, must themselves be consciously invested with care and attention if their inherent poison is to be curtailed: "The *pharmakon* is at once what *enables* care to be taken and that of *which* care must be taken – in the sense that it is necessary *to pay attention*: its power is *curative to the immeasurable extent* that it is also *destructive*" (2013: 4, emphasis original). The approach of pharmacology, then, comprises an analysis of how a technology's toxins and tonics materialize through the forms of perception and attention the technology in question facilitates. A pharmacology of writing, for instance, would weigh benefits and poisons by mapping the cultural and societal effects to which the mnemonic and perceptual affordances of

writing have given or may yet give rise. The profound analytical value of the concept of the *pharmakon* is that it enables a technological critique that departs from experience and perception. While we can make wider arguments about the toxicity of digital technologies (pointing to, for example, matters of surveillance, control and standardization), pharmacological thinking allows us to map the perceptual and sensory experiences that technology facilitates, to consider what the socio-cultural and environmental consequences of this perceptual situation are and to conceive of possible new ways of relating and attending to technology.

Stiegler suggests that we now live in a situation where "the pharmacological being proves incapable of taking care of itself or its others" (2013: 32). I argue, however, that his pharmacological theory does not fully account for why this is. Stiegler rightfully suggests that pharmacology must always consider technological ensembles as establishing systems of care (2021: 366), but Stiegler's (and, by implication, Derrida's) narrow and individually focused interpretation of the *pharmakon* overlooks a primary way in which today's technologies work to disinhibit care. They thereby neglect some of the most pressingly poisonous implications of the digital.

Stiegler believes that the most poisonous capacities of *pharmaka*, and especially the digital *pharmaka* that shape today's technological conditions, consist in the soliciting of "addiction," of "melancholy," of destructive drives (2013: 3) and the extermination of desire (2013: 75). While there is merit to his argument, it also misses something crucial about the concept of the *pharmakon*, especially in relation to contemporary technology. This conceptual limit becomes apparent from the title of Stiegler's most sustained work on pharmacology: *What Makes Life Worth Living* (2013). Stiegler argues that *pharmaka* should, above all, help create a *philia*, a *savoir-faire* and *savoir-vivre* that enable individuals to live a life worth living, in recognition of the pharmacological situation, able to adopt technologies to the benefit of their life and mind, capable of resisting the proletarianization that marks one of the digital's prime poisons (2019: 52-54, 243). Yet this leaves us with the question: what about the lives of others? To phrase this more concretely: what if the technologies that make our lives worth living actively harm other lives and communities? What if whatever cures a technology is thought to bring are tacitly supported by the poisonous toil of others, and what if technology today

consists precisely in, and in fact can only expand by, shaping forms of perception that direct users away from this quandary?

A Pharmacology of Frictionlessness

These questions pertain to the design philosophy of *frictionlessness* that typifies contemporary digital technologies. Frictionlessness shapes a strange perceptual situation where the reduction of notable friction in user experience is glorified (technology should be convenient and on-demand, host entirely noiseless communication and operate without delays), but where the way in which this is achieved is by expanding *and* obscuring vast systems of material extraction, exploited labor and environmental destruction. The ostensible efficiency, immateriality and transparency of technology are directly linked to extractive practices that are anything but immaterial. I have elsewhere charted the design philosophy of frictionlessness in more detail and have argued that it "maintains that the perfectibility of consumer technology lies in designing appliances that function so smoothly and that are woven so seamlessly into the fabric of everyday life, that the space between a user's emergent and often technologically informed needs and their technological satiation is optimally reduced" (Kemper, 2021: 39). Frictionlessness is arguably the most pervasive design philosophy today; we find it embodied by phenomena like cloud storage, smart devices and one-touch ordering (often with the promise of instant delivery), by the luxury of ride-hailing apps that reduce the inconvenience of personal communication and by influential terms like ubiquitous computing, algorithmic governance and ambient media. It is, similarly, what drives Mark Zuckerberg's dreams of the Metaverse, painting a world in which Facebook (now Meta), through a combination of virtual and augmented reality technologies, will inaugurate a mode of living in which users will never be outside Facebook's grasp (Sparkes, 2021). These manifold technological phenomena are marketed to users with an appeal to the values of user-friendliness, connectivity and optimization, suggesting a progressive disencumbering of the user's mind as it is able to freely delegate tasks to technological devices (Kemper, 2021: 40). Frictionlessness establishes, in sum, a perceptual condition in which technology at the same time mediates a constantly growing sphere of human activity *and* increasingly divests the user's view of technology's presence (along with everything that sustains this presence).

Perhaps the most influential exposition of what I term frictionlessness has been advanced by Shoshana Zuboff in her landmark work *The Age of Surveillance Capitalism* (2019). Zuboff's concept of surveillance capitalism underlines how the world's major tech companies are embroiled in a desperate struggle to attain the most efficient means of behavioral modification (2019: 8). This struggle sees them tirelessly seek out new supply routes of behavioral surplus, effectively turning all areas of life into sites from which data can be extracted, while hiding these extractive practices from the gaze of the user (Zuboff, 2019: 200). The ultimate ambition of Big Tech is to realize a world in which "the computer would be operational everywhere and detectable nowhere, always beyond the edge of individual awareness" (Zuboff, 2019: 227). Digital technology, in other words, is to become the invisible operating system to everyday life, mediating all facets of human existence without producing perceptible friction (friction might, after all, alert the user that their data is being mined and might enkindle critical reflection). As Zuboff's work shows, this vision of frictionless design has already largely been realized, as convenient and inconspicuous technologies like digital assistants, smart appliances and cleaning robots have reconfigured users' homes into reticular data stores.

I follow Zuboff's argument that the primary aim of frictionless design is the generation of surveillance capital. However, a significant by-product of the constant extension of this computational apparatus designed to mine data is that the material costs of digital technology are growing steeper. While consumers are encouraged to imagine their digital products and practices as "[having] no history: no mines, no manufacture, no freighting, and no waste" (Cubitt, 2017: 13), Crawford and Joler's map of Amazon Echo (2018) acutely conveys that the material foundations of digital technology are highly wasteful, relying on the extraction of large reserves of energy, labor and minerals. Crawford further develops this claim in her more recent work, emphasizing that "we are extracting Earth's geological history to serve a split second of contemporary technological time," uprooting centuries worth of earthly formations to deliver on the promise of lightning-quick connectivity (2021: 31). Similarly, media scholar Tung-Hui Hu spells out that the realm of cloud computing, whose numinous associations increasingly legitimate the migration of cultural practices to computer systems, constitutes "a layer of abstraction that masks the physical infrastructure of data storage," with its voracious appetite for water and energy (2015: 81). Sean Cubitt,

likewise, maintains that, deep within "the hieroglyphic forms of our communications hardware," there remain hidden traces of the "global networks of corporate crime, human suffering, and suicidal assaults on the environment" that underpin our supposedly spotless devices (2017: 65).[2] These various theorizations all speak to the distinct perceptual logic of frictionlessness: in the process of reducing friction in user experience, perception is also emptied of the ability to directly perceive the labors, torments and destructions that facilitate that experience.

For almost any digital technology, a map like Crawford and Joler's could be drawn up. These maps would invariably disclose how consumers' cherished devices are sustained by exploitative practices that disproportionately affect already disenfranchised groups and that further draw divisive lines between the Global North and the Global South. For every user partaking of frictionless design, there must be an opaque assemblage of matter, labor, energy and waste that conjures this frictionless experience into being. All too often, frictionlessness marks an iteration of a lamentably familiar logic: frictionless technologies tend to be driven by "capitalist and colonial forces that encourage the exploitation of Black and brown bodies so that white bodies can thrive" (d'Ignazio and Klein, 2020: 184). There tends, in this regard, to be a sharp divide between the end users who access the cloud to enjoy a streaming service and the miners who are tasked with extracting the earthly matter needed to sustain these practices, along with all the environmental damage this entails (Riofrancos, 2020; Devine, 2019; Cubitt, 2017). There is, similarly, a sharp divide between the consumer relishing the luxury of one-click shopping and the pool of (often migrant) warehouse workers (Delfanti, 2021; Crawford, 2021) and gig laborers (Van Doorn, 2017; Jones, 2021) necessary to make that service a reality. There is, likewise, a sharp divide between those who can heedlessly discard a device in favor of a more frictionless alternative and those who see their habitats destroyed by the accumulation of (e-)waste (Marder, 2021; Van Dooren, 2014; Jucan et al., 2019). Each of these divides is upheld and exacerbated by the design philosophy of frictionlessness: frictionless technologies shape a form of perception in which the user draws on but is at the same time actively prevented from attaining a direct sense of these divisive and shadowy underpinnings.[3]

When Stiegler suggests that an important part of "what still lies before us […] is to identify the role of *pharmaka* in the formation of […] consciousness as attention, in the

sense both of psychic attention and social attention, that is, moral consciousness" – "a play of retentions that the *pharmakon*, as tertiary retention, authorizes" (2013: 23) – he thus omits one of the most important aspects of the pharmacological question today: the way the user's attention is directed away from (and thus further provokes) the poisonous effects that spill from the material conditions of digital production. This broaches what I consider a crucial sense in which the concept of the *pharmakon* must be reconsidered: any perspective on the *pharmakon* should not simply examine how technology's simultaneous expansion and diminishment of perceptual, sensory and affective capacities impact the user's own individual life but should also consider what cures and poisons the alteration of these capacities brings for the lives of others. We cannot fully assess a technology's pharmacological qualities if we do not also evaluate how the experiences a technology shapes (or does not shape) implicate and affect the material elements of digital production and consumption. Frictionlessness especially reveals the importance of such a reconceptualization of the *pharmakon*: while much can be said about the effects of purportedly frictionless technology on the user (in terms of, for example, addiction, cognitive deterioration and overstimulation), we cannot fully grasp the nature of frictionlessness if we do not also view the wider societal and ecological effects, whether curative or poisonous, of the regimes of perception and attention it encourages.

This is certainly not to suggest that Stiegler has no eye for the environmental and socio-economic implications of digital technology. His conceptualization of a "general proletarianization" especially demonstrates a deep concern for these matters. For Stiegler, proletarianization describes a pervasive deprivation of knowledge that extends in many different directions – it signifies the digital expropriation of thought (which in turn is mobilized to short-circuit human desire) and the waning ability to understand what goes on inside of our machines, but also marks an intensification of the "functional opposition between producers and consumers" (2013: 54) and a diluted capacity to form sustained bonds of care. These processes are clearly related to frictionlessness: Stiegler is insistent that, with the machinic increase in calculation and efficiency, predominantly geared toward marketing and the expansion of capital, human knowledge and sociability are deteriorating. According to him, today's *pharmaka* effectively produce "desolidarization;" a "liquidation of social relations" (2010: 57) that

induces a "generalized irresponsibility" (2010: 59) in which people no longer feel any obligation to (or a sense of being nested in) the world around them.

This irresponsibilization also exacerbates environmental deterioration; Stiegler proves highly sensitive – especially in his later works – to the ecological crisis with which we are faced (although he does not adequately consider the material role that *pharmaka* themselves play as exploiters of a planetary infrastructure of resources). He proposes to counteract the Anthropocene by building toward what he calls the Neganthropocene, envisioning a collective undoing of the damage of proletarianization by nourishing forms of perception that establish the long circuits of care and consciousness needed to heal a broken world (2018: 52). My point, however, is that the pharmacological account he gives of these processes remains too focused on an individualized, psychopathological cure/poison schema: Stiegler is concerned more with the cognitive, psychological and social *effects* of automated, algorithmic, lightning-fast technologies than with the *ecological conditions* that have been set in place to produce these technological experiences in the first place.[4] While Stiegler's conceptualization of proletarianization helps to unpack numerous aspects of frictionlessness (the proliferation of speed and automation, the machinic exploitation of labor, the overtaking of conscious thought), there are thus also elements – especially those related to the self-perpetuating environmental demand incurred by user perception – that his account of pharmacology does not sufficiently address. More specifically, it is the direct interplay between user experience and its veiled ecologies of extraction that his theory of the *pharmakon* leaves mostly unthought.

Pharmacology, Twenty-First-Century Media and *Epokhal* Redoubling

The tendency of frictionless technology to operationally evade the narrow scaffolding of consciousness leads me to a recent critique of Stiegler's pharmacological project – one that, albeit offering useful corrections, also does not address what I have presented as the most important shortcoming in Stiegler's pharmacological work. In *Feed-Forward* (2015), Mark B.N. Hansen takes Stiegler to task for focusing too exclusively on the realm of higher-order temporal consciousness. According to Hansen, Stiegler's narrow scope fails to capture what is most pertinent about today's digital media: the fact that

a growing degree of their operations entirely evades the human sensorium (2015: 79). Hansen expands on this claim with the concept of *twenty-first-century media*: "By twenty-first-century media, I mean to designate less a set of objects or processes than a tendency: the tendency for media to operate at microtemporal scales without any necessary – let alone any direct – connection to human sense perception and conscious awareness" (2015: 37). This tendency, ensuring that we have no direct perceptual access to a growing amount of media operations, uproots familiar categories of media engagement and poses new conceptual challenges. These challenges extend to the technological logic I have thus far been charting; indeed, many of the technologies I have designated as frictionless – from the algorithmic procedures that drive our applications to the microsensors that populate our streets, from Echo's invisible communications with other household appliances to the insensible spheres of cloud computing – function precisely according to this logic of twenty-first-century media. More specifically, the logic of twenty-first-century media is in large part what affords them their frictionless aura: it is precisely the fact that so many media operations now evade perceptual awareness that makes these media appear progressively frictionless. After all, nothing is as (ostensibly) frictionless as a technology that performs its tasks and that anticipates or modulates our demands without us ever directly perceiving so. To phrase this even more bluntly: frictionlessness is the dominant cultural logic and means of propagation of twenty-first-century media.

The nature of twenty-first-century media prompts Hansen to claim that "the long-standing pharmacological 'pact' that has characterized the history of media from writing to cinema would seem to have been broken or, at the very least, rendered obsolete: simply put, what we get back has no possibility to compensate for what we give up" (2015: 71). Whereas in the case of writing, the poison of forgetting is directly linked to the cure of mnemonic assistance, twenty-first-century media simultaneously operate on an "experiential" and an "operational" level and there is no necessary pharmacological basis between them: while benefits and toxins may balance on the level of experience, there are currently only losses on the level of the operational, because the imperceptible data-gathering activities of twenty-first-century media affect our lives without offering any direct cognitive recompense. As Hansen clarifies, the "experiential affordances" of twenty-first-century media "cannot possibly

counterbalance" the losses on the level of the operational, "*for the simple reason that there is no direct experiential connection between them*" (2015: 73, emphasis original).

There is considerable merit to Hansen's argument and I am sympathetic to his political "principle of data neutrality" (2015: 74) which aims to open up the walled gardens of data companies in order to beckon the curative potential of twenty-first-century media, possibly expanding the scope of our experience and connecting us more deeply to the world of which we are part (2015: 24). Yet to fully grasp the ramifications of the design philosophy of frictionlessness, we must place two caveats next to Hansen's claim that the pharmacological pact has been severed. First, Hansen's account risks reproducing a myth of the digital as an immaterial force. The problem of twenty-first-century media is that perception is not only transcended by media, but that it thereby is also not directly confronted with the materiality of these operations. The stakes of this claim are best brought out by what Hansen describes as the "constitutive doubleness" of twenty-first-century media (2015: 6): "[W]e now live in a world where the very media that give us access to events outside the scope of our conscious attention and perception […] are now typically events that simultaneously contribute to the growth of this very domain of sensibility" (2015: 6-7). More concretely: the activities of twenty-first-century media and our mediating means of engaging them inherently expand media's domain, as every activity itself produces new data points that increase the totality. Twenty-first-century media thus describe a perennial feedback and feedforward loop that, despite its (lack of) appearances, is eminently material. Hansen, however, does not sufficiently specify that, even if we cannot directly perceive the operations of twenty-first-century media, their self-propagating and self-expanding logic takes root within computational hardware that requires a planetary framework of resources, labor and energy to operate. A pertinent pharmacological poison of twenty-first-century media is thus that they *at the same time* expand the material claim they lay on the world *and* progressively divest perception of this materiality.

Second, the relation between the levels of the experiential and the operational that Hansen identifies should be reconsidered by asking if there is not some pharmacological principle that links their seemingly irreconcilable playing fields. More pointedly, the very delegation of the experiential onto the operational is driven by a pharmacological logic. In the case of frictionlessness, as it is framed and experienced,

the lack of a direct experiential connection to twenty-first-century media is precisely the (alleged) cure: frictionlessness allows activities that traditionally belong to the experiential to slip into the imperceptible sphere of the operational, and this slippage in itself constitutes a recompense. Whereas an activity like grocery shopping conventionally places a sizable burden on perception and attention – forcing one to travel to the supermarket and to navigate what Lauren Berlant calls "the inconvenience of other people" (2022) – a frictionless technology like Echo enables its users to order groceries from the confines of their home and to delegate the subsequent tasks to a technical system that largely operates outside of their purview. For users, the ostensible pharmacological recompense thus consists in *not* having to directly experience a range of activities that previously weighed heavy on attention, in *not* having to have one's perception burdened with tasks that take up cognitive space (not having to experience something as a result of its transference to the realm of the operational is, in a sense, also an experience).

As suggested, a crucial poison that seeps from this movement of the experiential to the operational is that the unburdening of perception also loosens the capacity to perceive (and thus to direct attention and care to) the destructive or exploited materialities that facilitate these technical systems. As we have seen with Amazon Echo and similar frictionless technologies, a core constituent of the digital's operational logic is that its smooth affordances conceal but also further encumber constellations of exploited bodies, ecospheres and matters. As a last step in my argument, I suggest that the environmental ramifications of this frictionless form of perception can best be understood by invoking Stiegler's notion of *doubly epokhal redoubling*, which describes how individuals and societies adjust to technological changes. For Stiegler, the first stage of redoubling of a new *epokhē* always consists in the birth of a new *pharmakon* that provokes a disadjustment, a new situation to which the human sensorium is not yet attuned. Following my conceptualization, frictionlessness comprises precisely such an *epokhal* agent – it constitutes a new technological assembly, a new *pharmakon*, that is sufficiently impactful to introduce a new logic into society, a new configuration of "rhythms, temporalities and spatialities" (Stiegler, 2013: 35) that reorients existence, posing new challenges and problems (Stiegler, 2019: 144). The second moment of redoubling happens when a society finds a sustainable mode of adopting (instead of passively adapting to) the new *pharmakon*, a way of engaging technology that integrates

its pharmacological qualities in a viable fashion. If a society fails to find a way to absorb the *epokhal* shock in a sustainable manner, it is destined to perish, either by being absorbed into another society or by vanishing entirely (Stiegler, 2013: 35). For Stiegler, this is in itself not necessarily lamentable, as technical evolution by default means that certain modes and cultures of living fade out or are transformed (2013: 35). However, considering that today's pharmacological shock in many ways colludes with what Christophe Bonneuil and Jean-Baptiste Fressoz term the "shock of the Anthropocene" (2017), the scope of this situation is now universal: the planetary ramifications of our technological and computational modes of production are so extensive that a failure to trigger a second mode of redoubling could have globally catastrophic effects (cf. Cubitt, 2017).

Stiegler laments how it seems "as if we no longer have the ability or the knowledge to pursue this [second] process" (2019: 149). I argue that frictionlessness – or, more exactly, its pharmacological composition – is one of the reasons, if not the most dominant reason, for why this second moment appears to be curtailed. Frictionlessness fails to produce the friction that this second moment requires, the friction that would prompt users to seek new forms of adoption; frictionlessness designs *pharmaka* that are too smooth, too transparent, too comfortable, too stealthily addictive. The philosophy of frictionlessness thereby exhibits a curious sort of pharmacological logic. Whereas the diminishment of cognitive and perceptual capacities that the medium of writing inaugurated negatively affected the writer themselves, the diminishment that frictionlessness produces has more pernicious consequences for the lives of *others*. While frictionlessness follows the pharmacological schema of a simultaneous supplementation and restriction of perceptual experience, the poisonous effects of this transaction are most directly felt by subjects other than the user. To rephrase this in terms of the pharmacological shock and *epokhal* redoubling: by moving a plethora of mundane activities to an operational realm outside of experience and by propagating an ideology of convenience, frictionlessness erodes the capacity to see and, by implication, care for the material and often all-too-human constituents of technology. Hence, Stiegler's interpretation of the *pharmakon* should be expanded: he only considers and generalizes the individual psychopathological consequences of tertiary retention, whereas, if we want to gauge the effects of the perceptual affordances of frictionlessness, we must consider the fate and nature of what technology keeps from

view as well as the wider poisonous ramifications of how technologies inform individual perception.

Indeed, considering the destructive tendencies of our contemporary mediasphere – the steep material costs of the computational power that drives (twenty-first-century) media, the relentless extraction of finite resources and attendant displacement of indigenous communities, the precarious labor and toxic afterlives of e-waste that frictionlessness engenders – one might reasonably say that we are in dire need of a second moment of *epokhal* redoubling, a turn that would put us on the path to a sustainable, collective and inclusive human future. Yet the *pharmaka* of frictionlessness are explicitly designed to prevent this: they simultaneously move us closer to an irreversible pharmacological and Anthropogenic tipping point *and* curb the conditions required to recognize and mitigate this situation, dousing the desire for alternate technological futures. Rethinking the *pharmakon* in the manner I propose allows us to grasp the poisonous imbalance of our technological situation and underlines the need for a relation to technology that averts the toxic procedures through which technology currently facilitates perception.

Frictionless *Pharmaka*: Toward A New Conceptualization of the User

Stiegler asks, "what relation to technics and to technologies would enable us to think the reconstruction of a global future" (2013: 10)? As this paper has argued, Stiegler's pharmacological project offers valuable resources for thinking this question through, but it must also be revised if it is to capture the most pressing sensory and perceptual alterations that today's digital technologies instill. In this light, I suggest we expand the common technological interpretation of the notion of user with a second definition. While Stiegler insightfully reveals the digital, addictogenic processes that implore the user to passively adapt to digital technology's automated demands – that turn technological users, through tertiary retention, into proletarianized subjects that let themselves be mapped and modulated by technology – we need to add a second sense of the user if we want to arrive at a truly holistic pharmacology.

Pharmacological thinking means that we must also think of the user in the definition of an exploiter, a usurper; someone whose curative comforts are directly facilitated by

the poisonous afflictions of others. It is not sufficient to conceive of technology's venoms and cures only within the limited psychopathological scope of the user as an atomized subject. *Pharmaka* are material agents that all too often produce literally poisonous effects – effects that are exacerbated by and sprawl out far beyond what a restricted pharmacology might construe as a curative individual relation to technology. Not counting these constituent toxicities, and the way they are (or are not) aesthetically transmitted to the user, amongst the perceptual poisons causes one to miss the full implications of the contemporary reach of frictionlessness. If we want to align media theory more productively with the urgent stakes of the environmental humanities, we thus need to rethink the figure of the user on which media studies has so long relied. When we speak of the user, we should ask ourselves: what is it exactly that is being used? And to whose benefit and whose detriment? These questions implore us to consider functions and affordances, surely, but they also urge us to contend with the extractive, wasteful and labor-intensive operations that proceed obscurely in the background. A pharmacological perspective that highlights how user experience and perception affect and are affected by the environmental qualities of digital technology thereby provides a theoretical enrichment of a host of methodological approaches, whether it concerns software and interface studies, close readings of digital aesthetics or ethnographic inquiries into use cultures.

This paper, in sum, has advanced the claim that the central design philosophy to guide contemporary consumer technology is best captured by the notion of frictionlessness. I have argued that this philosophy gives rise to a perceptual condition in which user experience is directly dependent on a concealed infrastructure of exploitation, and in its dependence drives the ceaseless expansion of this spectral realm. It was demonstrated that the concept of the *pharmakon*, in mapping the perceptual poisons and cures of technology, allows us to bring out some of the most troubling aspects of the perceptual regime of frictionlessness. While Derrida and Stiegler, and the media-theoretical tradition of mobilizing the *pharmakon* that blooms in their wake, have gone a long way toward addressing the effects of technology, they do not adequately theorize the particular distribution of toxins and tonics that characterizes digital design today. Frictionlessness, that is to say, operates on a self-perpetuating toxicity that is imposed mostly on subjects other than the user and that is produced precisely through the seeming cure of smooth and convenient user perception. This distributive

imbalance paints an image of the user as a figure who, often unconsciously, exploits unseen others in order to enjoy an optimally frictionless experience.

Stiegler's pharmacological project comprises a valuable contribution to media theory, offering a lens through which to understand how user experiences of technologies purported to improve existence are nonetheless rife with feelings of anomie and anxiety. Yet such considerations should always be attended by a second question: what are the material conditions of this epoch's dominant forms of tertiary retention and how are these conditions exploited by and perceptually kept from technology's end users? Failing to address this question will prevent a truly collective and inclusive *epokhal* redoubling. Criticizing the collusion of user perception, as instantiated by frictionlessness, with a planetary system of unequal exploitations and erasures marks a first step in thinking through how digital technology might more effectively solicit care for its underlying conditions. Reconceptualizing the *pharmakon* in this fashion allows us to think about a truly communal pharmacology of the digital, whereby its curative capacities are collectively nurtured and its poisonous hazards contained.

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Notes

[1] As Michael Rinella cautions, the meaning of the term *pharmakon* is far from exhausted by this '"remedy/poison' bifurcation" (2010: 237, n.13), yet as this bifurcation is the dominant axis along which the concept is mobilized in the study of technology, this is the interpretation I will follow.

[2] For works that similarly chart the environmental costs of the digital, see, for example, Pitron, 2021; Taffel, 2019.

[3] If these processes are allowed to proceed unbounded, their effects will, of course, eventually catch up with all of us, but it nonetheless remains the case that the most immediate environmental effects of the use of digital technology are seldom felt by end users.

[4] Moreover, by tending to present proletarianization and irresponsibilization as general and uniform processes, Stiegler does not adequately account for the intersecting role of gender, race, class and location in the perception and mobilization of technology.

Jakko Kemper is a lecturer in New Media and Digital Culture at the University of Amsterdam whose research focuses on technology, aesthetics and ecology. He is coeditor of the edited volume *Imperfections: Studies in Mistakes, Flaws and Failures* (2021, Bloomsbury) and his work has previously been published in *Information, Communication & Society*, the *European Journal of Cultural Studies* and *Revue Intermédialités*.

Email: j.kemper@uva.nl