

9 Planetary Detox and the Neurobiology of Ecological Collapse

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We as a civilization are too much like someone addicted to a drug that will kill if continued and kill if suddenly withdraw.

James Lovelock¹

I Introduction

107 Addictogenic society and adaptation to stress

To the surprise of commentators worldwide, in his 2006 State of the Union Address, George W. Bush began a call for investment in climate change solutions with the assertion that ‘America is addicted to oil’, and, moreover, that ‘the best way to break this addiction is through technology’.² The claim was met with dismay by critics who, insisting on the need to differentiate between economic necessity and the euphoria of uncontrolled consumption, saw the 43rd president as legitimating hyperbole usually identified with the political left. Others have sought to demonstrate that the metaphor is not metaphorical: ‘Just as the consequences of alcohol abuse, from DUIs to cirrhosis, are symptoms, global warming is a symptom of oil addiction.’³

The tension between the two positions can be resolved by loosening the etiological criteria of addiction in line with contemporary research. In this context, it makes more sense to speak of our increasingly pathological attachment to the world of technological *pharmaka* enabled by oil, rather than being directly addicted to the black stuff itself – whether oil or carbon in general (see Chapter 10). Our focus is therefore less on a narrow definition encompassing only the stereotype of far-gone, destitute, and seemingly irrecoverable abusers of a small range of traditionally recognized addictogens, like alcohol and heroin, and more on what the social psychologist Bruce K. Alexander terms ‘addiction₃’: a category that admits the prospect of consuming more or less anything to the extent of consequential ‘overwhelming involvement’ (shopping, eating, video games, pornography,...), and

which for the most part sustains the appearance of normality by denying the potentially ‘fatal consequences’ of our actions.⁴

If, as Alexander claims, addiction is a ‘substantial and growing danger in the 21st century’,⁵ this is, contrary to myth, not because we have been seized by uncontrollable hedonism (we have known for close to thirty years that the neural mechanisms for craving are bound up with but not identical to those of pleasure⁶). Rather, it is because of the short-term therapeutic role addiction continues to play in facilitating our adaptation to the stressful environments of contemporary living, however detrimental it proves to be beyond that.

108 Addiction, entropy and microworlds

Foreshadowing Bush, and with a greater emphasis on the simultaneous curativity and toxicity of technology than we find in his eulogization of ecotech, in 1977 Nicholas Georgescu-Roegen wrote of ‘mankind’s addiction’ to the ‘comfort offered by the exosomatic organs’. This addiction, he continued,

which is completely analogous to that of the first fishes which evolved into air-breathing reptiles and thus became irrevocably addicted to air, now constitutes a predicament because the production of exosomatic organs became from a certain moment on dependent on the use of available energy and available matter stored in the bowels of the earth.⁷

The analogy risks being unhelpfully simplistic if read as diluting the concept of addiction to the point where even air is seen as addictogenic. But Georgescu-Roegen’s argument seems more refined if we link it back to his work on the use of technology to stave off entropy – and what the psychologist Mihaly Csikszentmihalyi terms ‘*psychic entropy*, a disorganization of the self that impairs its effectiveness [...] to the point that it is no longer able to invest attention and pursue its goals’.⁸

Through the technological organization of our local milieus, we construct our own little ecological niches, or microworlds, and create our own interiority in the process. This is what Bernard Stiegler calls the anti-entropy of ‘work’, in strict opposition to the entropic, or ‘anthropic’, exhausting, forces of ‘labour’.⁹ This sense of work is fundamentally related to what Csikszentmihalyi famously calls the vitalizing, ‘transcendent’ happiness of ‘flow’, or immersion in a self-contained and autotelic world of one’s own making, oblivious to the distractions of competing external stimuli. It is what he refers to as ‘being in the zone’. Csikszentmihalyi also sees, however, that flow

experiences, from watching television to performing surgery, can be powerfully addictive, providing zones of calm focus in the midst of bewildering transformation.¹⁰

Subsequent research, most notably by the addiction anthropologist Natasha Dow Schüll, has shown that the gap between therapeutic work and toxic addiction may be imperceptibly narrow. Technologies from gambling machines to smartphones, often designed explicitly with addictogenesis in mind, serve as substitutes for world- and self-creation, a means of restricting the turmoil-afflicted mind with goals and direction, alleviating stress and anxiety – in other words, psychic entropy – for those otherwise unable to achieve flow states.¹¹

109 Dysregulation of the dopaminergic system, delocalization and consumption

Proponents of 'entropic brain theory' in neuroscience similarly posit that stability-reinforcing patterns of activity associated with addiction (as well as OCD and depression) 'could be functional in [...] working to resist a more catastrophic collapse' into the regression they identify with 'primary', or elevated-entropy, states of consciousness.¹²

Yet regardless of the relative health, or capacity for withstanding environmental perturbation, afforded by these zones, a potentially explosive problem results from the way that local sites of anti-entropy tip out entropy into their surrounding environments, be they individual bodies or the societies that house them. Mental stability comes at a price, and one that becomes all the costlier when the stress produced by the labours of our ever-expanding technosphere goes hand-in-hand with exosomatosis, or the spiralling doses of technology needed to prop up our ailing biology and planet. This ailing has become all the more acute of late, on account not just of climate change, but moreover because of a mooted 'evolutionary mismatch' between the anthropic forcings and pressures exerted on us by our technologically organized milieus and the ability to accommodate them afforded by our evolved ('endosomatic') physiology – most notably, an overburdened and increasingly dysregulated dopamine system.¹³

The central contention of this chapter is that the two phenomena are indissociable: we cannot hope to combat the collapse of our planetary ecosystems if we do not first address the 'functional uncoupling'¹⁴ of *Homo sapiens* from the delocalized global spaces to which we are ever-increasingly pushed to adapt. At the very heart of ecological catastrophe is a chronic-systemic crisis of our psychological and social habitats, caused by populations who consume to dangerous

excess as the only available strategy for coping with the pressures of exploitation to which contemporary society exposes us.

II The Entropocene as Limbic Capitalocene

110 What the words *pharmaka*, *anthropy* and *health* mean here

It is a fundamental premise of this book that ‘Technology’, in the words of John Stewart, paraphrasing Stiegler, ‘is Anthropologically Constitutive’.¹⁵ We cannot grasp what it means to be human without reference to the technical prostheses that regulate our experience of time, desire and attention, not to mention our ability to participate in the expected norms of society. Our tools are as vital to social life and the life of the (noetic) mind as oxygen is to our physiological existence. For our evolved physiology to be continually reinvented by our technics, however, there needs to be a biological correlate that explains our plasticity; one that allows for who we are to be transformed by what we use to navigate the world.

The latest suggestion attributes the enlarged cerebral cortex of members of the genus *Homo* to a ‘dopamine dominated stratum’, which differentiates us from earlier hominid ancestors by accounting for enhanced sensitivity to social and environmental cues, as well as diminishing aggression in favour of sociality and cooperation.¹⁶ The dopamine system thus constitutes the neurobiological interface through which the human organism learns from and adapts to its surroundings, governing our responsiveness to external stimuli.

While it has long been understood that certain pharmaceutical substances, like alcohol or nicotine, exert a decisive modulatory effect on dopaminergic activity, and correspondingly on our behaviours, it is now becoming increasingly apparent that our experience of the world is continually rewritten, via the brain, by the technical objects that organize our lifeworlds. There is no hard and fast distinction, in other words, between pharmaceuticals and the simultaneously toxic and curative *pharmaka* that are technologies.

From ritual drinking and smoking, to the ever-larger and more energy-demanding cars needed by commuters (Georgescu-Roegen’s example), to the takeaway coffees and smartphones that now serve as unavoidable entry-points into the contemporary world of work, whose very necessity disinclines us to acknowledge the extent to which we are automated to accommodate their present, our social and mental lives are habitually structured around the legitimization of certain

modes of addictive, up-dosed technology consumption. But just as breathing oxygen is a principle cause of carcinogenesis, the life created or sustained by our exosomatic organs is also inseparable from what, following Stiegler, we are here calling *anthropy* and the deterioration of our artifactual environments. In a vicious circle of consumption, leading to environmental destabilization and to further, more pathological, consumption, the greater the stress placed on us by those environments, the more we become reliant on the therapy provided by the very technologies that do so much to cause the stress in the first place, and at ever greater cost to the planet.

The impact of some of this dependence is already well established and, indeed, being tackled, for instance, in the commitment of the United Nations Sustainable Development Goals to reducing deaths from 'non-communicable' diseases by one third. The WHO's report on *Health in 2015: From Millennium Development Goals to Sustainable Development Goals* devotes two whole chapters to NCDs: one focusing on mental health, dementia and substance abuse; and another on maladies stemming from poor lifestyle and preventable, *anthropically-caused*, environmental conditions including cancer, chronic respiratory problems, and so-called 'diseases of poverty' and 'despair' like cardiac illness and diabetes.¹⁷

The report remains conspicuously silent, however, on what can be identified as the underlying dopaminergic and ecological – and above all, economic – causes that link the two chapters, and has just as little to say about newer forms of environmental illness tied to the excessive consumption of more recent technologies. The effects of excessive screen-time on childhood development, and of social media on the health of our democracies,¹⁸ are only now becoming the object of emerging scientific knowledge. The recourse to digital tablets by exhausted parents, who for respite use them to pacify small children, has led to diagnoses of attentional deficiency and linguistic and emotional under-development often confused with autism.¹⁹

111 A dopaminergic history of industrial capitalism and proletarianization

In another indication that the fallout of technological intoxication calls for an understanding of addiction that takes us beyond conventional ideas about the scale and social impact of problematic consumption, connections have been made between election-hacking in the United Kingdom and United States, and digital media consumers' craving for a 'buzz value' that trumps the veracity of online content.²⁰

Luca Pani is the progenitor of the aforementioned theory of an ‘evolutionary mismatch’ between ‘current environmental conditions in industrialized countries’ and the ‘completely different’ ones ‘in which the human central nervous system evolved’. One ‘remarkable example’ of this uncoupling of the human organism from its habitat, he argues, is the development of ever more powerful delivery mechanisms of drugs into the brain, the cumulative effect of which is to

interfere with the global adaptation of an individual to its environment, producing not only an impairment in his/her hedonic capacities, but also a more disruptive effect on the cognitive and emotional abilities that are necessary for an effective interaction with the external world.²¹

The claim is made specifically in relation to hypodermic needles, crack pipes and the organic solvents often sniffed by addicts. But it also lends itself readily to a reading of the increasing potency of everyday technologies across the whole history of capitalism, which should no longer be separated into distinct producer- and consumer-led phases.

What began with the trade in spices and sugar, proceeds through tobacco, opium and caffeine on the way to pornography, pop music, modified corn starch and carfentanyl. The portable screen as a route of administration for the intoxications of ubiquitous gambling and fake news is just the latest stage in this history, and needs to be understood ecologically, in relation to the environmental stresses that push people in their direction, most notably the proletarianization of world-building, which the industrial production of craving, if not pleasure, seeks to offset. The passage to commodity-harvesting of comparatively mild psychoactives previously used only for medicine coincides with the early-modern onset of what the environmental historian Jason W. Moore calls ‘Cheap Nature’, referring to the un(der)paid toil extracted by merchants who would credit themselves for the industry of slaves, not to mention that of plant matter and the progressively depleted soil of the plantations.

This concept of Cheap Nature, encompassing ‘Cheap Food’, ‘Cheap Energy’, ‘Cheap Raw Materials’ and ‘Cheap Labour’, all priced in a way that ignores the long-term consequences of systemic overwork, takes us to the heart of what Moore reclassifies as the ‘Capitalocene’.²² But there’s also another, vital, ‘cheap’ at stake, here: one that cuts across the binary of nature and culture, forcing us to see the collapse of planetary ecosystems in terms of the degradation of our social-technological environments, and the undue stress that this places on our biological functioning. Let us call it Cheap Desire,

or Cheap Attention, in reference to a will that the climate-change-disavowing mentality of business-as-usual needs to be infinite. The *exhaustion* of this will, both individually and collectively, is bound up with increased reliance on the manufacture of habitual and frequently addictive consumption as a coping strategy.

112 The Anthropos of the Anthropocene

The long-standing but increasingly explicit elicitation of dopamine release in the human limbic system functions as the under-acknowledged engine of contemporary economics, not least because it constitutes the flipside of our enforced adaptation to the disadjusted environments in which we consume. Biologists have been warning for years of the risk posed to our health and intelligence by endocrine-disrupting pollutants,²³ but the reciprocal reinvention of humans and the technosphere is yet more profound than even this warning implies.

The *Anthropos* of the Anthropocene is one whose biochemistry is undergoing constant modulation by extractive technologies that engineer consumptive habits to maintain the waning levels of demands around which global order is organized. In the words of Bruce Alexander, addiction has been 'globalized' through the exploitation of the very nervous system via which we interact with and learn from our surroundings. This 'dopaminizing' is, in turn, inextricable from capitalism's production of 'psychosocial dislocation'²⁴ and our corresponding attempts to withdraw from what David Graeber has called the 'dead zones' of our traumatized working habitats.²⁵

When Jason W. Moore speaks of the 'Capitalocene', he does so to avoid holding the planet's various populations equally responsible for an ecological catastrophe caused vastly disproportionately by the 'developed' capitalist economies of the prevailing world system.²⁶ In so doing, he runs the risk of unduly divorcing us from complicity, as if capital is somehow distinct from the people who continually remake and enact it; hence our (Stieglerian) stated preference for Anthropocene, with its echo of *Entropocene*.²⁷

A more nuanced assignation of responsibility comes from reframing the problem of causality in relation to habit-creation and the manipulation of the pleasure circuitry of the brain. The American historian David T. Courtwright has coined the expression 'limbic capitalism' to describe the coupling of the entrepreneurial exploitation of the 'evolved drives' of our neural infrastructure of reward, with the provision of goods and services designed 'to cope with the damage' inflicted by free markets on the psychosocial structures that enable us to absorb the shock of change.²⁸ Limbic capitalism has been brought

to the fore by the combination of relentless labouring under conditions of mounting precarity and deficient social support systems, which places the burden of coping firmly on the side of individuals whose only survival mechanisms become the panoply of cures-for-sale offered up for consumption by the market.

Recent research into the social psychology and neurobiology of addiction suggests that this process should no longer be framed around the idea of the brain being irreversibly ‘hijacked’ by substances that destroy its natural chemical composition.²⁹ But there is a legitimate question of our complicity in the surrender of an agency that is only ever fragile. We willingly, albeit passively, submit to bombardment by ever more refined forms of stimulation to distract us from the perturbations of a market system that – be it via workplace deregulation, or through the imposition of structural adjustment programs on developing countries – systematically dissolves the capacity of communities to employ collective niche construction in the service of vitality, that is, to participate actively in the formation and modification of their living environments.

113 Anaesthesia and destruction

Bringing together Moore and Courtwright enables us to see that the ‘Entropocene’ is also a ‘limbic Capitalocene’: an epochal disaster encompassing not just the planet and human civilization, but one moreover rooted in a retreat into oblivion that Alexander describes as a ‘rational’, ‘adaptive’ response to the entropic climate in which we labour.³⁰ Ecological catastrophe is less about a surfeit of human ecosystem-engineering than its absence: the surrender of agency to an automation of the nervous system by technologies that think and feel in our place.

The result is a vicious cycle of excess, where climate change is biochemically intertwined with the overworking of the dopamine system, produced by the ever more efficacious doses of intoxicants we consume to anaesthetize ourselves against the impact of social breakdown. And this means that attempts to deal with climate change will only be treating its symptoms, and doing so in vain, unless they also engage with the addictogenic, ‘hyperdopaminergic society’ that lies at its origin. By the same measure, the solution will not reside in implementing consumption abstinence, ‘dopamine fasting’, or a global ‘Twelve Steps’ programme either.

We cannot do without our *pharmaka*, and nor can we simply eliminate their constitutive toxicity through some fantasized process of purification that preserves only their curativity. But we can aim for

an organization of society that curbs their toxic power by generating alternative forms of therapy. Such a reorganization would aim to lessen those stresses, which leave us in such need of noetic bandages and treatments [*pansements*] that we find ourselves consuming these intoxicating *pharmaka* to pathological, destructive excess. Understood in these terms, the project of planetary detox intersects felicitously with the philosophico-political aims of the internation: to cultivate locality and a restoration of depleted social bonds as a means to recapacitate the agency that we have surrendered to the compulsion to consume.

II Dopaminergic Animals in a Hyperdopaminergic Society

114 Culture, dopamine and attention

The crux of what looks like our collective pathology revolves around the relationship between culture and the neurotransmitter, dopamine, whose functions include bonding, the facilitation of experiential learning (through acquiring what we have throughout this book called retentions), habituation and anticipation (as what we have called pro-tentions). The principal role of dopamine concerns its involvement in the seeking out of novel information and the encoding of repeat behaviours that prove initially rewarding, or 'salient'. To put this in the recent language of Yuk Hui,³¹ it works to absorb contingency into a routine, by bringing us to crave the stability of habitual repetition.

The process begins at birth: one currently dominant idea builds on the attachment theory of John Bowlby to argue that the limbic system is responsible for the formation of social bonds between mother, child and the extended family.³² Bowlby observed that young children starved of maternal attention quickly adapt to their environmental instability by becoming withdrawn and emotionally detached, reacting more to the novelty of new toys than to the unfamiliar adults who bestow them.³³ These changes are now understood in relation to neuroplasticity, meaning the ability of the neuronal organization of the brain to be dopaminergically moulded by the stimuli of its surroundings. Rat studies have shown that contact between mother and child influences not only the development of dopaminergic circuits in the newborn's brain, but also conditions the parents' emotional and physical attentiveness, by bringing them to suffer the absence of their offspring through craving more familiarly recognized as love. Pups reared in prolonged isolation demonstrated 'elevated baseline

dopamine levels and increased dopamine release in acute stress in adulthood'.³⁴

The dopamine system, in other words, compensates for the lack of a familial anchor point by facilitating the creation of stabilizing habits in the face of stress. Through it, we reach out and latch on to anything able to create an emotional impact, with our neuronal circuitry reorganizing to become more responsive to the source of reward, pruning away synaptic relations linked to the decreasingly necessary wider orbit of attention, in the process. This mechanism for coping with the absence of a social bond proves highly adaptive, equipping us to live through anxiogenic periods of instability.

But it is also linked to 'enhanced sensitivity to psychostimulants such as cocaine' and 'may lead to increased vulnerability to addiction'.³⁵ Addiction thus 'shared a common neurobiology' with attachment,³⁶ in an identity that explains the scientific recognition that love bears all the neurobiological and psychological hallmarks of substance dependence. It should also, therefore, be seen as a kind of substitute for social investment – a way, we might say, of fabricating (ontological) ground, there where its absence becomes most apparent. The effect cuts both ways, with addiction characterized by a retreat from the social relations for which it substitutes. Looking at the tightly knit networks of companionship that often exist among street users, we can also see how it functions as a complicated attempt to create social attachments where they are found wanting.³⁷

115 The biology of attachment and the dopaminergic genesis of the mind

The biology of attachment is one way of making sense of Bernard Stiegler's claim that addictions are not solely pathological, but simultaneously toxic and curative.³⁸ It likewise sheds light on an established, but debatably successful, therapeutic tradition of seeking to replace toxic addictions (heroin, smoking, alcohol) with 'better' ones (to God, methadone, vaping, AA meetings and running, for instance).³⁹

Catherine Malabou is another recent exemplar of this tradition, arguing that 'addictive processes have in large part caused the Anthropocene, and only new addictions will be able to partly counter them'.⁴⁰ We need to be careful not to conflate 'better' with toxicity-free, or next-generation technological quick fixes, intended to facilitate consumption, however. The looming future of geo-engineered skies, seeded with a shield of aerosol phosphates to protect the planet from the solar heat building up behind it, has already been compared

to enabling alcoholism, as the 'dialysis that allows the patient to continue drinking'.⁴¹

The release of the dopamine neurotransmitter is at the heart of our capacity to adjust to environmental change, and its relation to managing uncertainty, in particular, explains why it has arguably played a vital role in both making and now unmaking the modern globalized world. Writing in *The Dopaminergic Mind in Human Evolution and History*, the psychologist Fred H. Previc argues that the story of human ecological history is one of increasing dominance of dopamine in the brain, which he links, in turn, to the rise of 'abstract intelligence, exploratory drive, urge to control and conquer', as well as acquisitiveness, goal- and future-directedness, long-term planning and the pursuit of religious and scientific truth.⁴² The emergence of the dopaminergic mind is developmental rather than evolutionary, a product of ecological shifts inducing neurochemical, but not genetic, change. It begins with prehistorical alterations in diet before intensifying around 6,000 years ago, alongside the growing need to compete for resources and ensuing calculations of settled societies.

Here, Previc's argument resonates with major evolutionary-anthropological claims about the inability of our cognitive architecture comfortably to manage large numbers of social relationships and the breakdown of our sense of communal belonging and motivation to participate in the life of the collective, once a certain scale threshold is passed.⁴³ We can identify Neolithic sedentarization and, in particular, the ensuing rise of cities (see Chapter 2) as a significant source of this growth of competition, because they removed people from the familiar, small-scale networks of extended family life and transplanted them into 'depersonalized'⁴⁴ urban settlements where they had to 'suppress suspicion of others', negotiate cultural politics and 'adapt to densely crowded neighbourhoods' of complete strangers: '*unfamiliarity* became the measure of human relations'.⁴⁵

The result of this heightened stress, Previc contends, was neurochemical imbalance, triggered by the depletion of serotonin and norepinephrine relative to dopamine. The next stage of his argument corroborates Peter Sloterdijk's identification of early-modern European expansionism with the rise of 'risk-taking', 'disinhibited' subjectivity.⁴⁶ Previc posits that the reorganization of society around dopamine was a decisive factor in colonialism, the growth of capitalism and the Enlightenment – and has become even more pronounced since the second, 'hyperdopaminergic', half of the twentieth century.

116 Neoliberalism as a hyperdopaminergic system

'Hyperdopaminergic society' describes the neoliberal era of enforced adaptation to the demands of free markets; the ideology of 'disruption'; and the proliferating use of dopaminergic techniques to colonize what has elsewhere been termed the 'available brain time' of consumers.

A highly dopaminergic society is fast-paced and even manic, given that dopamine is known to increase activity levels, speed up our internal clocks and create a preference for novel over unchanging environments.⁴⁷

Previc reels off a list of 'hyperdopaminergic disorders', including depression, obsession-compulsion, autism, schizophrenia, Tourette's, Alzheimer's and Parkinson's. We can also add ADHD to this list, though it is also, ironically, linked to traits that can thrive in hyperdopaminergic conditions.

The D4 dopamine receptor is believed to have evolved around forty thousand years ago, at a time when the enhanced susceptibility to stimulation it confers would have proved adaptively advantageous for ancestors who took risks to explore new territories in search of food. Nowadays, the allele is thought prevalent in sufferers of attention deficit disorders, who end up being pathologized by the absence of unexplored Palaeolithic landscapes in the cramped and understimulating conditions of contemporary urban living.⁴⁸ Homogenized, metric-heavy and greenspace-poor classrooms would be foremost examples of environments to which holders of the gene now risk being maladapted.⁴⁹

The attempt to diminish this maladaptation, by increasing our margins of tolerance for the 'inconstancies of the environment' (to borrow a phrase from Georges Canguilhem⁵⁰), is a major cause of addiction, which should be recognized as another hyperdopaminergic disorder; perhaps even the most prevalent one. Its inclusion within this category of stress-related illness need not presuppose the classical and now, it is argued, outdated 'disease model', which treats dependence as a neurobiological disorder of the dopamine system, routinely said to be triggered when the brain is 'hijacked' by a limited range of corruptive intoxicants. If this model offers an all-too-easy mechanism for separating out problem drinkers, junkies and pornography users from mere model consumers, contemporary research is moving in the opposite direction, disentangling addiction from threshold-surpassing quantities of specific substances to focus more on the hyperdopaminergic

setting that occasion an increasingly universal culture of obsessive consumption.

Addiction is now increasingly located at the intersection of the neuroplastic brain with the instability of what the clinician Jean-Pierre Couteron, a former president of France's *Fédération Addiction*, has baptized 'addictogenic society'.⁵¹ Pathology no longer resides solely in the addict, but is learned, stemming from the viciously circular moulding of synaptic circuits around manufactured intensities that substitute for the social bonds we are losing the luxury of forming. As our surrounding environments become more hyper-competitive and antisocial, ever higher doses of supply-maximized stimulus respond to both rising baseline levels of dopamine and the desensitization that follows from the brain's adjustment to habituation.

III Adaptation and Encapsulation

117 Capitalism and dependence

Addiction as a strategy for managing ecological stress is what we saw with the 'Gin Craze' of anomic, industrializing London, and in the gambling and opium dens through which the dislocated peoples of dopaminergic society absorbed the disadjustments of the eighteenth and nineteenth centuries. Phenomena like 'white morbidity'⁵² and the current American opioid crisis combine with the 'soaring' non-medical recourse to Tramadol in parts of Africa and Asia,⁵³ to say nothing of the ubiquity of staring vacantly at the screens of our digital devices, as instances of what Bruce Alexander describes as capitalism's contemporary 'globalization of addiction'.

There is nonetheless a difference between earlier, historical, epidemics and those that mark our hyperdopaminergic present. Patterns of abuse appear alongside periods of rapid technological change – the evolution of distillation and techniques, or instruments, of stimulation delivery – as new sources of stimulus overwhelm the social norms organized around older forms of technology.

But there is reason to think the organization of culture can prove highly effective in regulating consumption. One post-millennial rereading of China's Opium Wars emphasizes the success of traditional Chinese smoking rituals in absorbing the massive increase in supply and facilitating the management of functional habits. Frank Dikötter attributes much of received wisdom regarding opiate-addled Chinese people to colonialist-biological stereotypes of evolutionarily

weak-willed Orientals, which resurgent nationalism also exploited. Far more destructive, in terms of eliminating the social shock absorbers of 'backward' imperial culture, were the nationalists' politics of prohibition and the emergence of the disease model of addiction, which rewrote history to cast opium as wholly and singularly toxic: a destroyer of agriculture, work ethic and national character.⁵⁴ Fredric Jameson has written that 'the postmodern, or late capitalism, has at least brought the epistemological benefit of revealing the ultimate structure of the commodity to be that of addiction itself'.⁵⁵ But this was perhaps already apparent from the time of the Opium Wars, with opium's change in status coinciding with its commodification.

In any case, as has been argued elsewhere, historical addiction epidemics have tended to fade out as affected societies readjust their educational norms and social organization to accommodate hitherto disruptive technologies.⁵⁶ Bernard Stiegler has argued that, in our present age of the economics of 'disruption', the historical pattern of innovation leading to a 'readjustment' of society around new technologies, breaks down.⁵⁷ It comes as no surprise that global consumption has skyrocketed over the last thirty years, during the very period when knowledge of climate change might have suggested that we would be taking actions to curb it.

118 The conservative revolution of consumer capitalism

Since the conservative revolution of the 1980s, relentless waves of technological change have combined with labour market reforms intended to reduce the welfare safety net and spur us on to adapt to a more aggressively competitive, Darwinian way of life, dressed up as creative destruction. There is no time for systems of social support and integration to catch up with the disintegrations created by waves of technological-stimulatory overload. Coupled with the built-in obsolescence of technological devices designed for shortness of lifespan, these changes make chasing to keep up with the rest of society our default mode of existence.

It is in this context that the contemporary pattern of consumption is to have multiple, overlapping addictions, overlain on a metanarrative of unending adaptation, which leaves us struggling to create curativity with intermittent, 'hormetic' doses.⁵⁸ A constant state of excitation has become the ideological rule, irrespective of the longer-term damage this inflicts on our capacity for life-building.

Previc also suggests that, while posing potentially 'the greatest threat to mental health' in the industrialized world, the prevalence of dopaminergic disorders is 'much rarer or at least less severely

manifested in non-industrial societies'.⁵⁹ Emerging research on the serious under-diagnosis of mental illness in the developing world raises questions about the latter part of this claim.⁶⁰ So, too, should the continuity of ecological factors behind the rise of addictogenic societies. We can read the adaptationist economics underpinning the manufacture of dependence in the West as a direct continuation of the policies of dependence-inculcation trialled and imposed on Africa and Latin America, first through colonialism and then through the 'structural readjustment' programs of the IMF and WTO. The effect of both has been sustained disadjustment, where consumption comes to substitute for community-led vitality and social support systems.

119 Colonialism, opium war and forced adaptation

Between the seventeenth and early twentieth centuries, the British East India Company imposed organizational reforms on Indian agriculture that, in addition to causing massive starvation and catalysing the Opium Wars, also set the tone for the whole of the limbic Capitalocene. Prior to colonization, subsistence farming on communal land had been the norm. A traditional system of grain storage and reciprocal, mutual support enabled farmers to stave off the worst of climatic instability. But the British enclosed the commons and compelled the sale of grain reserves to drive up agricultural productivity, forcing the replacement of subsistence crops with those, including opium, specifically cultivated for export. The same opium was dumped on China to create habits and a demand that would be financed by the sale, hitherto refused, of Chinese tea to a British public newly enraptured by caffeine.⁶¹

Similar stories of enforced adaptation come from Latin America, where the carefully managed diversity of indigenous agriculture gave way, under duress, to the dominance of calorie- and dopamine-boosting sugar for export, which, in turn, freed up European labour to focus on urban industrialization.⁶² Later, postcolonial efforts to overturn industrial underdevelopment and the dependence of the developing world on Western industrial technologies were battered into submission by Western loans, distributed in the manner of a dealer looking to snare new clients, which merely reinforced relations of patronage. The conditions of loan receipt, and eventually also of their forgiveness and restructuring, went further in necessitating the destruction of techniques of social readjustment deemed to be constraints on the free functioning of the market.⁶³

'Resilience' came to denote the very opposite of how the philosopher of medicine, Georges Canguilhem, understands health: not the

capacity to reinvent one's milieu in the face of environmental perturbation, but relentless adaptation to the demand to open up domestic economies to international competition. The proletarianizing effect of dependence on licensed Western technologies is redoubled by the active inhibition of local forms of community vitality.

120 Globalization and dopamine

Dopamine is linked to globalization, on the one hand, by its contribution to abstract spatialization, exploration, conquest and the pursuit of stimulation; on the other hand, by its links to the destruction of locality to which we are now bearing witness. If the history of dopaminergic society is coextensive with that of the stresses and seductions of the city, with the latter now collapsing from the centre outwards, the two may yet also prove coterminous. Much recognisably modern state-building was also born of the pressures of urban intoxication. Well into the nineteenth century, cities were plagued by cholera-infested water, the pernicious effects of which were diminished by the 'antidiarrheal properties of narcotics and the antimicrobial properties of alcohol'.⁶⁴ According to Courtwright the building of waterworks and public fountains provided both hygiene and alternative sources of much-needed stimulation.

Public parks and spaces worked to similar counter-stimulatory effect. Their ongoing disappearance is already recognized as a contributory factor in the rise of the ADHD that has been described as the other 'side of the same mental coin' as addiction,⁶⁵ due to the way in which both conditions habitually entail a compulsive switching of focus away from socially preferred objects of attention, and towards more potent, distracting, sources of stimulus like screens and video games.

One of the great problems of the digital stage of dopaminizing, on this note, is that the conventional organization of our lives and analogue living spaces routinely provides little in the way of sufficiently attractive alternatives to coax those who have withdrawn from society back into it. If the city just about survives as a commercial entity, that is surely in large part because its high streets have been colonized by outlets furnishing the very objects of addiction and heightened stimulus, like smartphones, electronic cigarettes, coffee and alcohol, that push us away from it. As a site of ritual coming together and localized point-of-retreat, it is ceding its place to the delocalized, virtual microspheres of Amazon, Netflix and social media.

Hence, more broadly, the irony of our unfurling planetary crisis: it corresponds to the fracturing of the world, understood in the

Heideggerian sense of an ecology of possibility. Bruno Latour has recently analysed the politics of climate change disavowal around the idea of the 'absence of a *common world* we can share'.⁶⁶ Faced with the choice between sacrificing their way of living, or maintaining business-as-usual at the price of condemning vast swathes of the globe to devastation, Latour argues, governing elites have retreated from the aspiration to rule in the interests of the many, and simply seek to sequester themselves away in privatized niches, from which they can ride out the Apocalypse.

121 Spheres, bubbles, foam

Latour's argument works equally as a description of a much greater spectrum of limbic Capitalocenic behaviour, insofar as disavowal – a classic symptom of addiction – has become the default mode of experience; insofar as we are all seemingly engaged in a process of withdrawal from the universal public spaces formerly characterized by joint attention, collective projects and what Jacques Rancière would call a 'common aisthesis', or unifying experience of what amounts to the same place.⁶⁷ In dopaminized, addictogenic society, the shared world succumbs to fragmentation into the hermetically self-contained bubbles of private islands, gated communities and internet echo chambers in which one can escape the feelings of stressed-out hopelessness.

The reference to bubbles, here, recalls not only the filter bubbles of Web 2.0 evoked by Eli Pariser,⁶⁸ but also the social and psychological structures of immunity, the 'capsule architectures' and 'foam' of Peter Sloterdijk: 'In foam worlds, the individual bubbles are not absorbed into a single, integrative hyper-orb',⁶⁹ but remain separate. The limbic Capitalocene reveals itself as just the latest stage of the foaming of the world into self-contained capsules.

According to the psychiatrist Daniel Casriel, this search for insularity and 'safe spaces' is exactly what is at stake in addiction. Casriel understood 'encapsulation' as a third way out for those maladapted for 'fight or flight' to 'anesthetize' the feeling of being unable to cope.⁷⁰ And his generation of drug therapists sought to counter the tendency towards withdrawal by recreating a bridge between the addict's zones of retreat and the public sphere by reabsorbing individual bubbles of foam into a communal milieu.

Their project of detox through a reintegration of addicts into the public sphere was derailed by a combination of rehab consumerism – that is, of treatment models that reinforce the very proletarianizing tendencies they are supposed to combat – and the shift of policy-making towards the 'War on Drugs'. But proponents of this re-synthesis of

the public also ran up against the complexities of seeking to replace toxic forms of dependence with others deemed beneficial. Even during the 1970s, therapeutic communities of the kind pioneered by Phoenix House were accused of functioning as ‘encapsulated addict worlds’,⁷¹ where addicts were allowed to live without thought for their reinsertion into the shared space from which they had withdrawn through addiction.

IV Towards a Psychosocial Ecology of Detoxification

122 The symptomatic effects of worldwide withdrawal

If climate change is a problem of the limbic Capitalocene, which is to say, a phenomenon of addictive consumption induced by generalized proletarianization, then what would that mean for how we treat it? Interestingly, there is a parallel argument present both in the dominant paradigm of addiction treatments and partly also in the discourses of climate change. Its main logic consists in emphasizing the necessity of a radical break with existing patterns of consumption.

We owe to Daniel Ross the observation that, in an image much exploited by the industries of climate denial, the public imagination is dominated by visions of carbon cuts leading to enforced cold turkey: abrupt withdrawal from a way of life organized around technology-led consumerism, followed by the misery of endless abstinence, planet-wide ‘counting the days’, and slip-ups where we indulge in fracking ‘just one more time’. In the best-case version of this scenario, we might manage to get by as ‘functional’ addicts, carefully allowing ourselves a few minutes of internet, oil and shopping for plastic per day, but only in the strictly controlled doses already (ineffectually) advised in the small print of greenwashed society. Anything to avoid the intolerability of withdrawal symptoms that would be experienced both individually and collectively: perhaps not the vomiting and diarrhea induced by discontinuing opioids, but certainly anxiety, irritability and fatigue. And who knows how these would scale up at the level of politics and society?

Distaste for such symptoms, not to mention conviction in their absolute unviability, has already been circularly deployed to proscribe the diagnosis of addiction in relation to pathological digital media consumption.⁷² Environmental writers have been equally quick to insist that abstention from technology consumption is simply not an option.

Saving the world, it is routinely argued, will require more and greater technological modernity, not a reversion to 'collective sacrifice'.⁷³

The dubious advantage of framing ecological collapse in terms of the intolerable price of cold turkey, and more broadly of clinging to a disease model of addiction that allows us to distance climate change from pathological consumption, is that it exonerates us from taking preventive climate action until it's effectively too late – until, that is, we hit the mythical, iceberg-free, point of 'rock bottom'.

123 To touch or not to touch the (rock) bottom

Most famously spelled out in the second of AA's Twelve Steps, 'rock bottom' is the moment where we supposedly, finally, take the crucial measure of admitting 'hopelessness' and 'complete defeat' in the face of a 'mental obsession so subtly powerful that no amount of human willpower could break it'.⁷⁴ It dawns on us once the object of addiction becomes so all-consuming as to exclude everything else we hold dear from the increasingly narrowed orbit of attention. According to this logic, the typical alcoholic is so selfish and lacking in care that they will only be roused to action when it becomes a matter of literal life or death. Only having lost their job, their money, their family, their health and perhaps even their home – and now their planet – will they recognize the need to replace their own defective willpower with the motivation provided by AA, through God.

We should note a degree of wiggle-room in the original formulation of the *Twelve Steps*. AA co-founder Bill W refers to some early success in recruiting 'young people who were scarcely more than potential alcoholics', and even states one aim of the nascent society as being to spare them hell by 'rais[ing] the bottom the rest of us had hit to the point where it would hit them' sooner. That ambition was ultimately abandoned and he concedes that 'few people will sincerely try to practice the AA program unless they have hit bottom'.⁷⁵

The rock-bottom doctrine has since hardened into a cornerstone of the rehab industry, in spite of doubts over its basis in evidentiary science. According to the addiction writer Maia Szalavitz,⁷⁶ the consecration of hitting bottom is due in part to a judicial system that legitimates the counterproductively punitive treatment of addicts, not least by dressing up retribution as tough love. Writing in *The Sober Truth: Debunking the Bad Science Behind 12-Step Programs and the Rehab Industry*, the Harvard clinician and psychiatrist Lance Dodes is similarly critical. For Dodes, it is a myth that constitutes the ultimate form of marketing for a defective cure we are encouraged to consume all the more fervently when it emphatically doesn't work.⁷⁷

The continued success of the commercialized rehab industry cannot be divorced from the way that its failures are routinely explained away through reference to clients who, having yet to hit the nadir required to spur them towards committed sobriety, just don't want 'it' badly enough. The typically neoliberal emphasis on deficient personal responsibility conveniently covers over more compelling accounts of rehab's production of relapsing recidivists: namely, its replication of the paralysis and enforced adaptation to the very kind of (institutionally imposed) stressful circumstances that push people towards addiction in the first place.

Fortunately, however, abstention is no longer the shibboleth it once was in therapeutic circles. The majority of the 'addiction treatment industry is based on a defective model that has been unchanged since the 1930s', namely one built on the reification of the Twelve Steps into the kind of doctrinally rigid and proletarianizing, mass-produced consumerist model never envisaged by the Kropotkinian forefathers of Alcoholics Anonymous. Ideological dogmatism and the marketing of abstractly universal and ultimately branded modes of therapy have rendered many therapeutic institutions incapable of the self-transformation they preach, unwilling to share and create knowledge with 'rival' providers, and unwilling to devolve decision-making autonomy to patients who are frequently there by coercion, court-mandated to undergo rehab as an alternative to prison, and with no option but to comply with inflexible regimes imposed on them from above.⁷⁸

124 The origins of the Alcoholics Anonymous movement – contributory therapy

But 'there is also significance evidence' of 'empathetic and empowering approaches that let patients set their own goals'⁷⁹ yielding greater success than those that ultimately reproduce the environmental dislocation underpinning recourse to addiction. An emerging panoply of alternatives to the dominant one-size-fits-all programs of rehab includes elements of a return to the roots of AA in the anarchist theory of 'mutual aid'.⁸⁰ Previous chapters in this volume have sketched out how localities might be revitalized around the use of digital platforms to cultivate participatory, citizen-led, research, as per the territorial experimentations being undertaken in the Plaine Commune Contributory Learning Territory. In a clear nod to the ethos of self-organizing and spontaneously-emerging community support, their potential is to provide groups and networks of groups with their own means of generating self-knowledge, which enables them, in turn, to transform and revitalize through their own efforts the toxic

environments that make hyper-consumption a therapeutic response to disadjustment.

One pioneering experiment of this nature is Plaine Commune's 'Clinique Contributive' (see recherchecontributive.org/clinique-contributive/), which, under the auspices of the child psychiatrist Marie-Claude Bossière, brings together researchers, healthcare professionals and parents of young children diagnosed as suffering from the effects of overexposure to the distractions of digital technologies. Its aim is to combat screen addiction by creating a locality in which parents can learn from one another in a non-judgmental setting and generate shared knowledge about the developmental impact on their children of both parties' excessive consumption. The clinic also provides the basis for recreating the extended care networks whose erosion has made often isolated, tired and stressed-out adults cling to the comfort of their smartphones in the absence of better psychosocial integration. In exploring the connections between fatigue and the sustained use of sleep-impoverishing devices, they discover alternative forms of invigoration to digital overstimulation.

Contributory therapy thus becomes a technique for inventing forms of emotional and social connection that transcend commercialized individualism, new forms of *philia* tied to the pursuit of the common good, echoing the kind evoked by Aristotle in Books VIII and IX of the *Nicomachean Ethics*. We can also see it as a form of work (not labour – see Chapter 3) and as a process of 'capabilization' (see Chapter 4) in which the contribution to knowledge allows people to become what they are 'able to do and be'.⁸¹

125 The therapeutic group – *therapeia* and *philia*

The therapeutic potential of contributory research can also be understood through the insights into human development of the Russian psychologist Lev Vygotsky. Vygotsky's conviction was that human action is a transformational process where individuals, *Homo sapiens* as a species, and tools, exist in a network of mutual co-creation. In an essay on 'The Collective as a Factor in the Development of the Abnormal Child', Vygotsky characterized the social dimension of development as a 'function of collective behaviour, as a form of cooperation or cooperative activity'.⁸² He borrowed from city-planning the concept of a 'zone of proximal development' to articulate how, with the help of peers, or of another more competent individual, the child becomes able to do things that she was not previously capable of doing.⁸³ Vygotsky saw this phenomenon occurring especially in playful situations, where the 'child always behaves beyond his average

age, above his daily behaviour; in play it is as though he were a head taller than himself'.⁸⁴ Development, he argued, emerges from a social, relational context in which the individual and the group grow into something different, by creating new norms in their relationship with the environment.

One of the few attempts to transfer this perspective into practice took place in the East Side Institute in New York, where, in the 1970s, the therapists Fred Newman and Lois Holzman combined Vygotskian conceptualizations of development with Wittgenstein's work on language to create the psychotherapeutic method of 'Social Therapy'.⁸⁵ Social Therapy starts from the premise that individuals 'are forced to adapt to conditions which increasingly and more and more obviously are against not only their own interests but those of the human species as a whole',⁸⁶ with drugs and homelessness being part of a wide range of failed attempts at adaptation. And it understands the group as a 'unit of transformation/change/growth/learning' through which individuals can be transformed without a specific focus on 'fixing the problems' of its members.⁸⁷

The group becomes both a method and a result, its activities serving as an *emotional zone of proximal development*. This volume's chapter on 'social sculpture' outlines a similar 'transindividuation' of individuals within a collective through knowledge-sharing. Despite criticizing the rigidity of the Alcoholics Anonymous, Dodes likewise reinforces the value of this kind of localized therapeutic community, suggesting that 'groups would be a highly valuable component' in the treatment of addiction 'if they were designed to help patients [...] to experiment with new ways of relating'.⁸⁸

126 The mother of all critical situations

From this perspective, the function of addiction is to facilitate the co-creation of forms of life hitherto impossible to imagine. And the relationship between what constitutes the possibility and impossibility of future development should be considered one of the most important steps in a therapeutic endeavour.

In his book, *The Psychology of Experiencing: The Resolution of Life's Critical Situations*, another Russian, Fyodor Vasilyuk, sought to investigate

just what a person does when there is nothing to be done, when he or she is in a situation that renders impossible the realisation of his or her needs, attitudes, values, etc.⁸⁹

Such moments are 'critical situations' in which the individual is unable to 'cope with the existing external and internal conditions of life'.⁹⁰ The same encounter with a metaphorical brick wall is addressed in DeYoung and Krueger's understanding of psychopathology as a 'persistent failure [...] to generate effective new goals, interpretations, or strategies when existing ones prove unsuccessful'.⁹¹

The Anthropocene presents us with the mother of all critical situations, one that threatens the very habitability of the planet, over and above exposing as ineffective the existing norms around which our lives are organized. Yet it therefore also offers an opportunity for the abandonment of old norms that are making us ill, and an overdue end to hyperdopaminergic society. Hence its paradoxical promise of renewed vitality.

Notes

- 1 James Lovelock, *The Revenge of Gaia* (Harmondsworth, Middlesex: Penguin, 2007), p. 8.
- 2 George W. Bush, 'State of the Union Address' (31 January 2006), available at: <<https://georgewbush-whitehouse.archives.gov/stateoftheunion/2006/>>.
- 3 Stephen Healy, 'Psychoanalysis and the Geography of the Anthropocene: Fantasy, Oil Addiction, and the Politics of Global Warming', in Steve Pile and Paul Kingsbury (eds), *Psychoanalytic Geographies* (New York: Routledge, 2014), p. 181.
- 4 Bruce K. Alexander, *The Globalization of Addiction: A Study in the Poverty of Spirit* (Oxford: Oxford University Press, 2007), pp. 35–37.
- 5 Ibid., p. 37.
- 6 Terry E. Robinson and Kent C. Berridge, 'The Neural Basis of Drug Craving: An Incentive-Sensitisation Theory of Addiction', *Brain Research Reviews* 18 (1993), pp. 247–91.
- 7 Nicholas Georgescu-Roegen, 'Inequality, Limits and Growth from a Bioeconomic Viewpoint', *Review of Social Economy* 35 (1977), p. 363.
- 8 Mihaly Csikszentmihalyi, *Flow: The Psychology of Happiness* (London: Rider, 2002), p. 37.
- 9 Bernard Stiegler, *L'emploi est mort, vive le travail! Entretien avec Ariel Kyriou* (Paris: Mille et une nuits, 2015).

- 10 Mihaly Csikszentmihalyi, 'Reflections on Enjoyment', *Perspectives in Biology and Medicine* 28 (1985), pp. 489–97.
- 11 See Natasha Dow Schüll, *Addiction by Design: Machine Gambling in Las Vegas* (Princeton: Princeton University Press, 2012), and Louis Leung, 'Exploring the Relationship Between Smartphone Activities, Flow Experience and Boredom in Free Time', *Computers in Human Behaviour* 203 (2020), pp. 130–39.
- 12 Robin L. Carhart-Harris, et al., 'The Entropic Brain: A Theory of Conscious States Informed by Neuroimaging Research with Psychedelic Drugs', *Frontiers in Human Neuroscience* 8 (2014), p. 15.
- 13 See Luca Pani, 'Is There an Evolutionary Mismatch Between the Normal Physiology of the Human Dopaminergic System and Current Environmental Conditions in Industrialized Countries?', *Molecular Psychiatry* 5 (2000), pp. 467–75, and also Pani, A. Porcella and G. L. Gessa, 'The Role of Stress in the Pathophysiology of the Dopamine System', *Molecular Psychiatry* 5 (2000), pp. 14–21.
- 14 Pani, 'Is There an Evolutionary Mismatch?', p. 473.
- 15 John Stewart, *Breathing Life into Biology* (Newcastle: Cambridge Scholars, 2019), p. 132.
- 16 Mary Ann Raghanti et al., 'A Neurochemical Hypothesis for the Origin of Hominids', *PNAS* 115 (2018), p. E1111.
- 17 World Health Organization, *Health in 2015: From MDGs, Millennium Development Goals, to SDGs, Sustainable Development Goals* (December 2015), available at: <<https://www.who.int/gho/publications/mdgs-sdgs/en/>>, chs 6–7. For overviews on diseases of poverty and despair, see Michael Meit, Megan Heffernan and Erin Tanenbaum, 'Investigating the Impact of the Diseases of Despair in Appalachia', *Journal of Appalachian Health* 1:2 (2019), pp. 7–18, and Jonathan McGavock, Brandy Wicklow and Allison B. Dart, 'Type 2 Diabetes in Youth is a Disease of Poverty', *The Lancet* 390 (2017), p. 1829.
- 18 See, for example, David Runciman, *How Democracy Ends* (London: Profile, 2018), pp. 124–26.
- 19 Daniel Marcelli, Marie-Claude Bossière and Anne-Lise Ducanda, 'Plaidoyer pour un nouveau syndrome "Exposition précoce et excessive aux écrans"', *Enfances & Psy* 79 (2018), pp. 142–60. See also Morgane Balland, Delphine Bizeul, Carole Guillet and Marie-Claude Bossière, 'Les effets des écrans sur les tout-petits: Syndrome ou symptôme? Hypothèses sociétales et psychomotrice', *Enfances & Psy* 80 (2018), pp. 157–67.

- 20 Gerald Moore, 'Automations, Technological and Nervous: Addiction Epidemics from Athens to Fake News', *New Formations* 98 (2020), pp. 119–38.
- 21 Pani, 'Is There an Evolutionary Mismatch?', pp. 469 and 471.
- 22 Jason W. Moore, *Capitalism in the Web of Life* (London: Verso, 2015), pp. 114–18 and 171–73.
- 23 See, for example, A. C. Gore, R. T. Zoeller et al., 'EDC-2: The Endocrine Society's Second Scientific Statement on Endocrine-Disrupting Chemicals', *Endocrine Reviews* 36 (2015), pp. E1–E150.
- 24 On 'dopaminizing', see, for example, Gerald Moore, 'Dopaminizing and Disavowal: Addiction and Digital Capitalism', in Vanessa Bartlett and Henrietta Bowden-Jones (eds), *Are We All Addicts Now? Addiction and Digital Capitalism* (Liverpool: Liverpool University Press, 2017); Gerald Moore, 'The Pharmacology of Addiction', *Parrhesia* 29 (2017), pp. 190–211. On the 'globalization of addiction', see Alexander, *The Globalization of Addiction*, pp. 250–64.
- 25 David Graeber, 'Dead Zones of the Imagination: An Essay on Structural Stupidity', *The Utopia of Rules: On Technology, Stupidity, and the Secret Joys of Bureaucracy* (New York: Melville House, 2015).
- 26 Jason W. Moore, 'Anthropocene or Capitalocene? Nature, History, and the Crisis of Capitalism', in Jason W. Moore (ed.), *Anthropocene or Capitalocene: Nature, History and the Crisis of Capitalism* (Oakland: Kairos, 2016), p. 81.
- 27 See also Bernard Stiegler, *Qu'appelle-t-on panser? 2: La leçon de Greta Thunberg* (Paris: Les Liens qui Libèrent, 2020), pp. 108–11.
- 28 David T. Courtwright, 'Mr ATOD's Wild Ride: What Do Alcohol, Tobacco and Other Drugs Have in Common?', *Social History of Alcohol and Drugs* 20 (2005), p. 121. See also David T. Courtwright, *The Age of Addiction: How Bad Habits Became Big Business* (Cambridge, Massachusetts: Belknap, 2019), pp. 6–12.
- 29 See, for example, Sally Satel and Scott O. Lilienfeld, 'Addiction and the Brain-Disease Fallacy', *Frontiers in Psychiatry* 4 (2014), pp. 1–11.
- 30 Alexander, *The Globalization of Addiction*, p. 64.
- 31 Yuk Hui, *Recursivity and Contingency* (London and New York: Rowman & Littlefield, 2019).
- 32 See Lane Strathearn, 'Maternal Neglect: Oxytocin, Dopamine and the Neurobiology of Attachment', *Journal of Neuroendocrinology* 23 (2011), pp. 1054–65; see also Thomas R. Insel, 'Is Social

- Attachment an Addictive Disorder?', *Psychology & Behaviour* 79 (2013), pp. 351–57.
- 33 John Bowlby, *Attachment and Loss, Volume 1: Attachment* (London: Pimlico, 1997), pp. 27–28.
- 34 Strathearn, 'Maternal Neglect', p. 1060.
- 35 Ibid., p. 1058.
- 36 Insel, 'Is Social Attachment an Addictive Disorder?', p. 351.
- 37 Jesse Proudfoot, 'Drugs, Addiction, and the Social Bond', *Geography Compass* 11 (2017), p. 2.
- 38 Bernard Stiegler, *The Lost Spirit of Capitalism: Disbelief and Discredit, Volume 3*, trans. Daniel Ross (Cambridge: Polity Press, 2014), p. 86.
- 39 See Gerald Moore, 'Philosophy and Other Addictions: On Use and Abuse in the History of Life', in Oliver Davis and Colin Davis (eds), *Freedom and the Subject of Theory: Essays in Honour of Christina Howells* (Oxford: Legenda, 2019), p. 185.
- 40 Catherine Malabou, 'The Brain of History, or the Mentality of the Anthropocene', *South Atlantic Quarterly* 16 (2017), p. 47.
- 41 Eli Kintisch, *Hack the Planet: Science's Best Hope – or Worst Nightmare – for Averting Climate Catastrophe* (Hoboken: John Wiley & Sons, 2010), p. 9.
- 42 Fred H. Previc, *The Dopaminergic Mind in Human History and Evolution* (Cambridge: Cambridge University Press, 2009), pp. 149–50 and 162.
- 43 R. I. M. Dunbar, 'Coevolution of Neocortical Size, Group Size, and Language in Humans', *Behavioral and Brain Sciences* 16 (1993), pp. 681–735; Dieter Claessens, *Das Konkrete und das Abstrakte* (Frankfurt am Main: Surhkamp, 1993), pp. 93–144.
- 44 On the 'depersonalization of life', see Daniel Casriel, *A Scream Away from Happiness* (New York: Grosset & Dunlap, 1974), p. 126.
- 45 Monica L. Smith, *Cities: The First 6,000 Years* (London: Simon & Schuster, 2019), p. 8.
- 46 Peter Sloterdijk, *In the World Interior of Capital: Towards a Philosophical Theory of Globalization*, trans. Wieland Hoban (Cambridge: Polity Press, 2013), pp. 50–51 and 57–58.
- 47 Previc, *The Dopaminergic Mind in Human History and Evolution*, p. 150.

- 48 Thomas Armstrong, *The Power of Neurodiversity: Unleashing the Power of Your Differently Wired Brain* (Philadelphia: DaCapa, 2011), p. 36; see also Gerald Moore, 'De la neurodiversité à la noodiversité: Pour construire des niches numériques dans la ville stupéfiée', in Bernard Stiegler (ed.), *L'Intelligence des villes et la nouvelle révolution urbaine* (Paris: FYP, 2020).
- 49 Armstrong, *The Power of Neurodiversity*, pp. 41–42; see also Jaak Panskepp, 'Attention Deficit Hyperactivity Disorders, Psychostimulants, and Intolerance of Childhood Playfulness: A Tragedy in the Making?', *American Psychology Society* 7:3 (1998), pp. 91–92.
- 50 Georges Canguilhem, *The Normal and the Pathological*, trans. Carolyn R. Fawcett with Robert S. Cohen (New York: Zone Books, 1991), p. 197.
- 51 Jean-Pierre Couteron, 'Société et addiction', *Le Sociographe* 39 (2012), pp. 10–16.
- 52 Anne Case and Angus Deaton, 'Rising Morbidity and Mortality in Midlife among White Non-Hispanic Americans in the 21st Century', *PNAS* 112 (2015), pp. 15078–83.
- 53 United Nations Office on Drugs and Crime, *World Drug Report 2018*, 'Executive Summary: Conclusions and Policy Implications' (June 2018), available at: <https://www.unodc.org/wdr2018/pre-launch/WDR18_Booklet_1_EXSUM.pdf>, p. 1.
- 54 Frank Dikötter, Zhou Xun and Lars Laamann, *Narcotic Culture: A History of Drugs in China* (London: Hurst & Co., 2004), pp. 88–91.
- 55 Fredric Jameson, 'The Politics of Utopia', *New Left Review* 25 (2004), p. 52. See also Fredric Jameson, 'An American Utopia', in Slavoj Žižek (ed.), *An American Utopia: Dual Power and the Universal Army* (London: Verso, 2015), pp. 89–92.
- 56 Moore, 'Automations, Technological and Nervous', pp. 137–38; Moore, 'Philosophy and Other Addictions', p. 186.
- 57 Bernard Stiegler, *The Age of Disruption: Technology and Madness in Computational Capitalism*, trans. Daniel Ross (Cambridge: Polity Press, 2019), §8.
- 58 Courtwright, *The Age of Addiction*, pp. 226–27.
- 59 Previc, *The Dopaminergic Mind in Human History and Evolution*, p. 151.
- 60 Tina Rosenberg, 'Busting the Myth That Depression Doesn't Affect People in Poor Countries', *The Guardian* (30 April 2019), available at: <<https://www.theguardian.com/society/2019/apr/30/>>

busting-the-myth-that-depression-doesnt-affect-people-in-poor-countries>.

- 61 Jason Hickel, *The Divide: A Brief Guide to Global Inequality and Its Solutions* (London: Windmill, 2017), pp. 86–93.
- 62 Ibid., p. 76.
- 63 Ibid., pp. 150–53.
- 64 Courtwright, *The Age of Addiction*, pp. 98–99.
- 65 Susan Greenfield, *Mind Change: How Digital Technologies Are Leaving Their Mark on Our Brains* (London: Rider, 2014), p. 188.
- 66 Bruno Latour, *Down to Earth: Politics in the New Climatic Regime*, trans. Catherine Porter (Cambridge: Polity Press, 2018), p. 2.
- 67 Jacques Rancière, ‘Ten Theses on Politics’, trans. Rachel Bowlby and Davide Panagia, *Theory & Event* 5:3 (2001).
- 68 Eli Pariser, *The Filter Bubble: What the Internet is Hiding from You* (New York: Penguin, 2011).
- 69 Peter Sloterdijk, *Spheres, Volume 1: Bubbles. Microspherology*, trans. Wieland Hoban (Los Angeles: Semiotext(e), 2011), p. 72. See also Peter Sloterdijk, *Spheres, Volume 3: Foams. Plural Spherology*, trans. Wieland Hoban (South Pasadena: Semiotext(e), 2016).
- 70 Casriel, *A Scream Away from Happiness*, pp. 58 and 64. See also Claire D. Clark, *The Recovery Revolution: The Battle Over Addiction Treatment in the United States* (New York: Columbia University Press, 2017), p. 83.
- 71 Clark, *The Recovery Revolution*, p. 92.
- 72 Sherry Turkle, *Alone Together: Why We Expect More from Technology and Less from Each Other* (New York: Basic Books, 2010), p. 293.
- 73 See, for example, Michael Shellenberger and Ted Nordhaus, ‘Evolve: The Case for Modernization as the Road to Salvation’, in Michael Shellenberger and Ted Nordhaus (eds), *Love Your Monsters! Postenvironmentalism and the Anthropocene* (Washington, D.C.: Brookings Institute, 2011).
- 74 Alcoholics Anonymous, *Twelve Steps and Twelve Traditions* (New York: Alcoholics Anonymous World Services, 1953), p. 22.
- 75 Ibid. pp. 23–24.
- 76 Maia Szalavitz, *Unbroken Brain: A Revolutionary New Way of Understanding Addiction* (New York: St. Martin’s Press, 2016), pp. 180–82.

- 77 Lance Dodes and Zachary Dodes, *The Sober Truth: Debunking the Bad Science Behind 12 Step Programs and the Rehab Industry* (Boston: Beacon, 2014), p. 135.
- 78 See, for example, Allison McKim, *Race, Gender and Drugs in the Era of Mass Incarceration* (New Brunswick: Rutgers University Press, 2017), p. 13.
- 79 Szalavitz, *Unbroken Brain*, p. 183.
- 80 Robin Room, 'Alcoholics Anonymous as a Social Movement', in B. S. McCrady and W. R. Miller (eds), *Research on Alcoholics Anonymous: Opportunities and Alternatives* (New Brunswick: Rutgers Center of Alcohol Studies, 1993), pp. 167–87.
- 81 Martha Nussbaum, *Women and Human Development: The Capabilities Approach* (Cambridge: Cambridge University Press, 2000), p. 69.
- 82 Lev S. Vygotsky, 'The Collective as a Factor in the Development of the Abnormal Child', in Robert W. Rieber and Aaron S. Carton (eds), *The Collected Works of L. S. Vygotsky, Volume 2: The Fundamentals of Defectology*, trans. Jane E. Knox and Carol B. Stevens (New York: Kluwer/Plenum, 1993), p. 192.
- 83 Lev S. Vygotsky, 'Thinking and Speech', in Robert W. Rieber and Aaron S. Carton (eds), *The Collected Works of L. S. Vygotsky, Volume 1: The Problems of General Psychology*, trans. Norris Minick (New York and London: Plenum, 1987), p. 198.
- 84 Lev S. Vygotsky, *Mind in Society: The Development of Higher Psychological Practices* (Cambridge, Massachusetts: Harvard University Press, 1978), p. 102.
- 85 For a brief and not uncritical review of Newman and Holzman's work, see Morten Nissen, Erik Axel and Torben Bechmann Jensen, 'The Abstract Zone of Proximal Conditions', *Theory and Psychology* 9 (1999), pp. 417–26.
- 86 Fred Newman and Lois Holzman, *Lev Vygotsky: Revolutionary Scientist* (London: Routledge, 1993), p. 157.
- 87 Lois Holzman, "'Vygotskian-izing" Psychotherapy', *Mind, Culture, and Activity* 21:3 (2014), p. 188.
- 88 Dodes and Dodes, *The Sober Truth*, p. 79.
- 89 Fyodor Vasilyuk, *The Psychology of Experiencing: The Resolution of Life's Critical Situations* (New York: Harvester Wheatsheaf, 1991), pp. 6–7.
- 90 *Ibid.*, p. 35.
- 91 Colin G. DeYoung and Robert F. Krueger, 'A Cybernetic Theory of Psychopathology', *Psychological Inquiry* 29:3 (2018), p. 121.