Preface

> Workings of the world untie! You have a win to world!
>
> —The Cyborg International

Disparate times call for disparate methods. Let's just say that this is the end of pre-history, this moment when planetary constraints start really coming to bear on the ever-expanding universe of the commodification of everything. This is the worldview-changing realization that some now call the *Anthropocene*. Let's not despair. Some of the greatest accelerations in the life of our species-being have happened in moments of limit, if never before on such a scale.

The Anthropocene is the name Paul Crutzen and others give to this period of geological time upon which the planet has entered. Crutzen:

> About 30–50 percent of the planet's land surface is exploited by humans … More than half of all accessible fresh water is used by mankind. Fisheries remove more than 25 percent of the primary production in upwelling ocean regions … Energy use has grown sixteen-fold during the twentieth century … More nitrogen fertilizer is applied in agriculture than is fixed naturally in all terrestrial ecosystems.[1]

It's not the end of the world, but it is the end of pre-history. It is time to announce in the marketplace of social media that the God who still hid in the worldview of an ecology that was self-correcting, self-balancing and self-healing—is dead. "The Anthropocene represents a new phase in the history of the Earth, when natural forces and human forces became intertwined, so that the fate of one determines the fate of the other. Geologically, this is a remarkable episode in the history of the planet."[2] The human is no longer that figure in the foreground which pursues its self-interest against the background of a wholistic, organicist cycle that

the human might perturb but with which it can remain in balance and harmony, in the end, by simply *withdrawing* from certain excesses.

This is not the end of pre-history that the main currents of critical theory thought they would encounter. So perhaps we need some new critical theory. Or new-old, for it turns out that there was a powerful and original current of thought that was all but snuffed out in a previous, failed attempt to end pre-history. There may even be more than one. But the one I offer here in the first part of this book, "Labor and Nature," bears the names of two Russian Marxist writers, Alexander Bogdanov and Andrey Platonov.

Once we are equipped with this preterite thought, we can set it to work. In the second part, "Science and Utopia," we move from the cold and hunger of early Soviet Russia to the sunshine and plenty of California at the end of the twentieth century. The feminist science studies scholar Donna Haraway and the science fiction writer Kim Stanley Robinson are avatars of two approaches to thinking and writing at the end of this pre-history that echo and update Bogdanov and Platonov for our self-consciously Anthropocene times.

Common sense has it that the Cold War is over, that the Soviet Union lost and the United States won. While some would wish to hibernate in some "psychic soviet," the dominant mood is that regnant American-style capitalism won a global victory. The historic arc of *Molecular Red* is different. In this version, the collapse of the Soviet system merely prefigures the collapse of the American one. While the ruins of the first are real and poignant, the ruins of the latter have not quite been apprehended for what they are.[3]

A traveler among the antique ruins comes across the shattered visor of a rusting ship, half sunk in sand. Round the decay of this colossal wreck nothing beside remains; only desperation, boundless and bare. The name of this vessel has peeled off, but it might as well be named after Ozymandias, the fabled Egyptian king of Shelley's poem, and his challenge "Look on my works, ye Mighty, and despair!"

Beyond this rusting hull lies innumerable others. This is a modern ruin, mass-produced. And it is not just sand or time that ruined it. This dusted Martian landscape is one of the Seven Wonders of the World in negative. The vast and now gone waters that these ships once plied was the Aral Sea, which is less than a tenth of its former size.[4]

There were once pharaoh-sized statues here too. The Aral Sea is in what was once the Soviet Union, so perhaps the statues were of Lenin, pointing to a future rather remote from this one. But the ship itself is a wreck that recalls a power of a different kind: the capricious stubbornness of the natural world.

Cotton-growing actually began in this region when the American Civil War cut off Russia's cotton supply. After the revolution, Soviet engineers tapped the Amu Darya River that flowed into the Aral Sea as a water source for a cotton industry. The Soviets greatly expanded cotton production as an export crop after World War Two, and built vast irrigation projects to this end. Enormous quantities of water were an input, mixed with soil and seed and fertilizer, to grow cotton plants. The engineers knew the Aral Sea would disappear. Its fishing fleet was collateral damage, and so too perhaps were the many species of plant and animal now fossilizing here.

This is an example of what, after Marx, we might call *metabolic rift*.[5] Labor pounds and wheedles rocks and soil, plants and animals, extracting the molecular flows out of which our shared life is made and remade. But those molecular flows do not return from whence they came. The waters diverted from the Aral Sea to the cotton fields did not come back. As Marx knew, agriculture is a maker of deserts.

Marx's example of metabolic rift was the way nineteenth-century English farming extracted nutrients such as nitrates from the soil, which growing plants absorbed, which farmers harvested as crops, which workers in the cities ate to fuel their industrious labors, and who would then shit and piss the waste products out of their private metabolisms. Those waste products, including the nitrates, flow through run-off and sewers and pour out to sea. Whole industries for making artificial fertilizer would arise to address this rift—in turn causing further metabolic rifts elsewhere.[6]

The Anthropocene is a series of metabolic rifts, where one molecule after another is extracted by labor and technique to make things for humans, but the waste products don't return so that the cycle can renew itself. The soils deplete, the seas recede, the climate alters, the gyre widens: a world on fire. Earth, water, air: there is a metabolic rift where the molecules that are out of joint are potassium nitrate, as in Marx's farming example; or where they are dihydrogen-oxide as with the Aral sea; or where they are carbon dioxide, as in our current climate change scenario.

It used to seem as if exhausting the soil here or diverting water there were local problems. The Anthropocene is the recognition that some metabolic rifts are global in scope.[7] Nitrogen and carbon are on vacation from their old routines. Climate change already appears to be affecting the global distribution of water in profound ways. The Aral Sea experience of Soviet times is a microcosm of our now global experiment in metabolic rift. The draining of the Aral Sea was a kind of terraforming in reverse, making Earth into a Martian desert rather than Martian

deserts into a new Earth.[8]

Marx: "All that is solid melts into air."[9] That effervescent phrase suggests something different now. Of all the liberation movements of the eighteenth, nineteenth and twentieth centuries, one succeeded without limit. It did not liberate a nation, or a class, or a colony, or a gender, or a sexuality. What it freed was not the animals, and still less the cyborgs, although it was far from human. What it freed was chemical, an element: carbon. A central theme of the Anthropocene was and remains the story of the Carbon Liberation Front.

The Carbon Liberation Front seeks out all of past life that took the form of fossilized carbon, unearths it and burns it to release its energy. The Anthropocene runs on carbon.[10] It is a redistribution, not of wealth, or power, or recognition, but of molecules. Released into the atmosphere as carbon dioxide, these molecules trap heat, they change climates. The end of pre-history appears on the horizon as carbon bound within the earth becomes scarce, and liberated carbon pushes the climate into the red zone.[11]

Powerful interests still deny the existence of the Carbon Liberation Front.[12] Those authorities attentive to the evidence of this metabolic rift usually imagine four ways of mitigating its effects. One is that the market will take care of everything. Another proposes that all we need is new technology. A third imagines a social change in which we all become individually accountable for quantifying and limiting our own carbon "footprint." A fourth is a romantic turn away from the modern, from technology, as if the rift is made whole when a privileged few shop at the farmer's market for artisanal cheese.[13] None of these four solutions seems quite the thing.

The first task of critique is to point out the poverty of these options.[14] A second task might be to create the space within which very different kinds of knowledge and practice might meet. Economic, technical, political, and cultural transformations are all advisable, but at least part of the problem is their relation to each other. The liberation of carbon transforms the totality within which each of these specific modes of thinking and being could be practiced. That calls for new ways of organizing knowledge.

Hegel, that great systematizer of knowledge, thought the French Revolution was a world-historical moment, but from our vantage point in time he was mistaken.[15] A world-historical event of considerably more general significance is the discovery of the totality of effects of human activity on its material support, on what we now call the *biosphere*.[16] All the products of any labor process have to be factored back into it, and for all of them. That's a task beyond any master-

thinker or grand plan, beyond the magic of the market or computer modeling. How to think about designing the ad hoc practices for mitigating such a rift? *Molecular Red* sets itself the lowly task of gleaning some forgotten histories, neglected concepts, and minor stories that might usefully re-orient thought to such an agenda.

We are not short of big-picture stories, either about the fate of the October Revolution, or the grand epoch of unchallenged capitalism since the demise of the Soviet Union.[17] Here the left doesn't differ too much from the right. This is a drama of events that could be called the *molar*, where big-bodied entities clash, antagonist against protagonist. Meanwhile, the interesting processes might be more subtle and imperceptible—*molecular*. Felix Guattari: "The same elements existing in flows, strata and assemblages can be organized in a molar or a molecular mode. The molar order corresponds to signification that delimits objects, subjects, representations and their reference systems. Whereas the molecular order is that of flows, becomings, phase transitions and intensities."[18]

The molecular is less obvious but not more real than the molar. In the pores of those vast dramas of class and party, nation and history, there is another kind of story: the Carbon Liberation Front and the metabolic rift. It's a question of being able to perceive both molar drama and molecular gesture together, of not being too distracted by the stagecraft of the molar clash of embodied ideas.

How can knowledge and labor be organized to extract a *living* from nature when that very process produces secondary effects that undermine its own ongoing life? Taking on the Carbon Liberation Front requires not just actions of a number of different kinds but their integration. What we need is a kind of *low theory*, for designing integrated solutions on a collaborative basis, which includes many kinds of people's experience of the labors of the molecular.[19]

The unspeakable secret about climate change is that nobody really wants to think about it for too long.[20] It's just too depressing! Reading about it sometimes seems like helplessly watching some awful train derailment careen in slow motion. Rather, let's take this world-historical moment to be one in which to reimagine what the collective efforts of everyone who labors could make of the world, and as a world.

Here is the itinerary for *Molecular Red*: Our story begins with Alexander Bogdanov. Once Lenin's rival for the leadership of the Bolsheviks, he went on to elaborate and occasionally even try to implement a radical practice of knowledge. He took the core of Marxism to be the *labor point of view*. He thought that if labor was to organize the world, it needed to develop its own organization of knowledge, which he called *tektology*, and its own means of cultural development, or *proletkult*.

Bogdanov saw a positive role for ideologies as *worldviews* that overcome affective *resistance* to organizing the human side of collective labor. Drawing on the philosopher-scientist Ernst Mach, his own worldview is an *empiro-monism*, which took its metaphors from advanced labor practices, including the sciences, and refused all spiritual doubles to this world. He understood the emotional appeal of the spiritual and saw *utopia* as another way of motivating the needs and wants of labor in its collective tasks.

Bogdanov usefully delimits the category of *nature*. To him it specifies *that which labor encounters*. It's a focused yet open way to handle a term that can so quickly get out of hand. But Bogdanov still thought in terms of labor's domination over nature. Here we turn to Andrey Platonov, perhaps the greatest proletkult writer, but one who gave up writing in the worst years of the Russian Civil War to become an engineer. Nature appears as harsh and unforgiving in Platonov, and he grasps early on that as labor presses down on nature, nature presses down even harder on labor. Usually thought of as a fiction writer, I treat Platonov as a theorist not just of the point of view of labor, but the point of view of *comrades*.

For Platonov, we are comrades only when we face the same dangers. Those dangers start with famine and the struggle to produce an *infrastructure* that could undergird the grand projects of the early Soviet period. Platonov extends the idea of an organization of knowledge, by and for labor, into his vision of a *factory of literature*, able to collaboratively filter the everyday life of working people into an understanding of collective labor and its tasks.

Bogdanov was largely forgotten and Platonov mostly unknown to those who created postwar versions of Marxism as a critical theory, the best known of which center on philosophy, cultural critique or normative political thought. In Part II of *Molecular Red* I pick up the thread of those writers who, while having little else in common with Bogdanov and Platonov, at least worked as they did on the borders between culture and the *sciences*, and across both critical and fictional writing. My central examples are the Californian writers Donna Haraway and Kim Stanley Robinson. Our themes also change here, from *Labor and Nature*, to *Science and Utopia*.

The synthesis of Ernst Mach and Karl Marx attempted by Bogdanov has few inheritors. I begin Part II with one of Mach's defenders, Paul Feyerabend, who finds Mach far from a simple-minded "empiricist" and rather a practitioner of an art of discovery, in which philosophy's tendency to high theory is muted, but the experimental rerouting of concepts from one kind of scientific labor to another is part of a *dada* method. It's a way of keeping the rather extravagant tendencies of language-work oriented toward matters at hand.

The central node onto which Feyerabend and everyone else in Part II is grafted is the work of Donna Haraway, who gives the metaphoric potentials of language a freer hand, rather like Bogdanov did in his tektology, even though Haraway stays very close to the biological sciences. Haraway usefully updates Bogdanov's account of worldview as both means and limit to organizing the world, and she confronts his concept of the labor point of view not only with a *feminist standpoint*, but also with its porous boundaries with other organisms, and with technology, not least in her famous concept of the *cyborg*. The cyborg refigures the imaginative possibilities not only for critical but also for utopian thought, in these times inextricably entangled with *techno-science*.

Two other writers influenced in various ways by Haraway help flesh out the cyborg point of view within a world made over by techno-science. Karan Barad's close engagement with modern physics shows Mach's tactics for thinking scientific knowledge at work. She introduces to the labor, or rather cyborg, point of view a close attention to the *apparatus*, as that which makes the *cut* between labor and nature in the act of producing knowledge.

Paul Edwards extends this concept of apparatus to that of the *knowledge infrastructure* required to collaboratively produce a science of the Carbon Liberation Front and its climate-changing effects. Here we witness the collaborative labor of scientists and technical labor producing a new worldview and overcoming resistances, both technical and ideological, on a global scale.

In the age of the Carbon Liberation Front, even sunny California can seem like a vision haunted in advance by its own ruins. No wonder critical theorists are now turning to past-times, reading Saint Paul for instance, as if there was nothing for it as Rome burns but to day-trip in the City of God. This is why, to conclude *Molecular Red*, I turn to Kim Stanley Robinson, whose majestic *Mars Trilogy* science fiction novels revisit the utopian practice of Bogdanov for the age of techno-science. I read these books as theoretical works. Robinson offers a mode of writing that really does confront this era of metabolic rift with a renewal of utopian thought, in which, strangely enough, science fiction turns out to be a kind of realism of the possible.

Like Haraway, Robinson takes us always to be cyborg beings embedded in techno-science. Like Barad, he is attentive to how different apparatuses make cuts that produce different objects and subjects of knowledge. Like Platonov, Robinson asks how such different subjects engaged in different struggles in and against their object-worlds can yet be comrades. Like Bogdanov, he refuses an over-arching high theory in favor of a low theory of negotiating between different worldviews.

What Robinson offers is something like a *meta-utopia*, a kind of writerly

problem-solving practice for combining different visions of an endurable future. For at the end of the day, what Bogdanov and Platonov, Haraway and Robinson have in common is a critical and creative approach to the *selection* out of the past, into the future, of ways of life that know that only if our species-being endures can it be said to touch the real.

But now, a caveat: These are strictly amateur discussions of the languages of the sciences. They are not meant to settle disputes or provide an overarching philosophy, still less to proffer a humanist judgment on other modes of knowing. I take being a theorist writing about the sciences not to be a claim to any kind of authority but simply as permission to be wrong. Where these discussions of the sciences are wrong, the test is whether they can be *usefully* wrong, in providing metaphors or diagrams to test out in other fields of collective labor.

A theory for the Anthropocene can be about other things besides the melancholy paralysis that its contemplation too often produces. Here I think there's a place for what Platonov called *secondary ideas*. What can keep the larger project from becoming debilitating is getting to work on the kinds of knowledge practices that are useful in a particular domain. The particular secondary ideas that are the topic of *Molecular Red* are about selecting from within the archive those strands of Marxist theory for which the Anthropocene already appears as an object of thought and action in all but name.

Addressing the Anthropocene is not something to leave in the hands of those in charge, given just how badly the ruling class of our time has mishandled this end of pre-history, this firstly scientific and now belatedly cultural discovery that we all live in a biosphere in a state of advanced metabolic rift. The challenge then is to construct the *labor perspective* on the historical tasks of our time. What would it mean to see historical tasks from the point of view of working people of all kinds? How can everyday experiences, technical hacks and even utopian speculations combine in a common cause, where each is a check on certain tendencies of the other?

Technical knowledge checks the popular sentiment toward purely romantic visions of a world of harmony and butterflies—as if that was a viable plan for seven billion people. Folk knowledge from everyday experience checks the tendency of technical knowledge to imagine sweeping plans without thought for the particular consequences—like diverting the waters of the Aral Sea.[21] Utopian speculations are that secret heliotropism which orients action and invention toward a sun now regarded with more caution and respect than it once was. There is no other world, but it can't be this one.[22]

Most historical thought that takes ameliorating climate change seriously

assumes one of two big-picture narratives, the first of which is *capitalist realism*.[23] This insists that there is no alternative, and we just have to stick with the program. If it takes the planet down with it then so be it. The alternative narrative imagines a kind of non-technical, holistic and spiritual alternative, often drawing its images from a pre-capitalist landscape. But as was already clear to Marx, this is *capitalist romance*, a story constructed within capitalism itself as one of the byproducts of its own momentum.[24] It is a kind of capitalist realism in negative, where we all ride bamboo bicycles, but it rarely ventures beyond an ideological mirroring of capitalist realism.

What we need then is an alternative realism. One which sticks close to the collaborative labors of knowing and doing. One which opens toward plural narratives about how history can work out otherwise. A realism formed by past experience, but not confined to it. This requires something of a reorienting of critical thought away from certain dominating tendencies: rather than a speculative realism in philosophy, a speculative fiction that makes no claims to be a spokesmodel for the object world, let alone the absolute; rather than an obsession with all-powerful capital and the phantasm of a pure redeeming communism, a working knowledge of the ways labor and nature confront and confuse each other; rather than a totalizing critique of technology as the acme of Western metaphysics, a frank acknowledgment of the entangling of our cyborg bodies within the technical.

What the Carbon Liberation Front calls us to create in its molecular shadow is not yet another philosophy, but a poetics and technics for the organization of knowledge. As it turns out, that's exactly what Alexander Bogdanov tried to create. We could do worse than to pick up the thread of his efforts. So let's start with a version of his story, a bit of his life and times, a bit more about his concepts, from the point of view of the kind of past that labor might need now, as it confronts not only its old nemesis of capital, but also its molecular spawn—the Carbon Liberation Front. Here among the ruins, something living yet remains.

Endnotes

PREFACE

1 Paul Crutzen, "'Geology of Mankind," *Nature*, Vol. 415, No. 23, January 2002. The term Anthropocene was probably coined by Eugene Stoermer. See also Vaclav Smil, *Harvesting the Biosphere: What We Have Taken from Nature*, Cambridge, MA: MIT Press, 2013.

2 Jan Zalasiewicz, Mark Williams, Will Steffen, and Paul Crutzen, "'The New World of the Anthropocene," *Environmental Science and Technology Viewpoint*, Vol. 44, No. 7, 2010, pp. 2228–31.

3 Ian Svenonius, *Psychic Soviet*, Chicago, IL: Drag City, 2006. For a tour of the ruins of the twentieth-century West, see the Center for Land Use Interpretation, *Overlook: Exploring the Internal Fringes of America*, London: Thames & Hudson, 2006.

4 Tom Bissell, "'Eternal Winter," *Harpers Magazine*, April 2002, Vol. 304, No. 1823. See also Rob Ferguson, *The Devil and the Disappearing Sea*, Vancouver: Raincoast Books, 2003.

5 I am indebted to the work of John Bellamy Foster for the significance of Marx's thinking about metabolic rift. See John Bellamy Foster, *Marx's Ecology: Materialism and Nature*, New York: Monthly Review Press, 2000. See also the work of Jason Moore for a different elaboration of the concept.

6 See Esther Leslie, *Synthetic Worlds: Nature, Art and the Chemical Industry*, London: Reaktion Books, 2006, a terrific account of German romanticism, dada, and critical theory, in the context of early twentieth-century Germany's great contribution to modern capitalism: the chemical industry.

7 See John Bellamy Foster et al., *The Ecological Rift*, New York: Monthly Review Books, 2010. The rifts mentioned there include not only climate change but also ocean acidification, stratospheric ozone depletion, nitrogen and phosphorous cycles, fresh water shortages, loss of biodiversity and accumulated chemical pollution, which together might be described as the Anthropocene.

8 On terraforming, see Kim Stanley Robinson, *Red Mars*, New York: Bantam Books, 1993, to be discussed later in this book. See also M. M. Averner and R. D. MacElroy, *On the Habitability of Mars: An Approach to Planetary Ecosynthesis*, NASA SP-414, 1976.

9 Karl Marx and Friedrich Engels, "'Manifesto of the Communist Party," in Karl Marx, *The Revolutions of 1848*, London: Verso, 2010, p. 70. See also Marshall Berman, *All That Is Solid Melts Into Air: The Experience of Modernity*, New York: Penguin, 1988. Of course, much of the resonance of this phrase is an artifact of translation: "Alles Ständische und Stehende verdampft": All that stands steams into statements.

10 Elmar Altvater, *The Future of the Market*, London: Verso, 1993. Altvater is also useful in showing why the Soviet planning system could not compete against the West, without in the process becoming the latter's cheerleader. In both cases, the attempt to make labor more "'efficient" was fossil-fueled.

11 For a quick review, see Kerry Emmanuel, *What We Know About Climate Change*, Cambridge, MA: Boston Review Books, 2007, or the poignantly titled "'Summary for Policymakers" to the Intergovernmental Panel on Climate Change, *Climate Change 2013: The Physical Science Basis*, New York: Cambridge University Press, 2014, pp. 3–32. For some context, see Bill McKibben (ed.), *The Global Warming Reader*, New York: O/R Books, 2011. Naturally, the Carbon Liberation Front was articulated with other (non)social movements, methane liberation, for example. In the last chapter of *Gamer Theory*, Cambridge, MA: Harvard University Press, 2007, I use methane as the molecular fulcrum for a critical theory of the totality.

12 On climate deniers, see Naomi Oreskes, *Merchants of Doubt*, New York: Bloomsbury, 2011.

13 See Andrew Ross, *Bird On Fire*, Oxford: Oxford University Press, 2011, for an excellent case study on "green" politics and consumerism which spatially displaces problems onto the less powerful without solving them.

14 See John Bellamy Foster, *The Ecological Revolution*, New York: Monthly Review Press, 2009; Allan Stoekl's *Bataille's Peak: Energy, Religion, and Postsustainability*, Minneapolis: University of Minnesota Press, 2007, is particularly effective on the carbon footprint measuring obsession.

15 Rebecca Comay, *Mourning Sickness: Hegel and the French Revolution*, Stanford, CA: Stanford University Press, 2012. Or perhaps the revolution in Haiti: See Susan Buck-Morss, *Hegel, Haiti and Universal History*, Pittsburgh: Pittsburgh University Press, 2009.

16 Vladimir Vernadsky, *The Biosphere*, New York: Springer Verlag, 1998; Vaclav Smil, *The Earth's Biosphere: Evolution, Dynamics, and Change*, Cambridge, MA: MIT Press, 2003.

17 As an exemplar, see Eric Hobsbawm, *The Age of Empire*, New York: Vintage, 1987, and *The Age of Extremes*, New York: Vintage, 1994.

18 Félix Guattari, *The Anti-Oedipus Papers*, Los Angeles: Semiotext(e), 2006, p. 418. The molar and molecular concepts were adapted by Guattari and Gilles Deleuze from Gilbert Simondon. See also Félix Guattari, *Three Ecologies*, London: Continuum, 2008, for a succinct statement of Guattari's ecological post-politics; and Manuel DeLanda, *A Thousand Years of Non-Linear History*, New York: Zone Books, 2000, for a wonderfully literal-minded approach to the molecular.

19 On low theory see Judith Halberstam, *The Queer Art of Failure*, Durham, NC: Duke University Press, pp. 15–18.

20 Although I am grateful to some humanities scholars who have focused their attention on such things. See Dipesh Chakrabarty, "The Climate of History: Four Theses," *Critical Inquiry*, No. 35, Winter 2009; Nicholas Mirzoeff, "Visualizing the Anthropocene," *Public Culture*, Vol. 26, No. 2, 2014; Henry Sussman (ed.), *Impasses of the Post-Global: Theory in the Era of Climate Change*, Ann Arbor, MI: Open Humanities Press, 2012.

21 This would map both my agreement and disagreement with the "accelerationists." See Robin Mackay and Armen Avanessian (eds.), *#Accelerate: The Accelerationist Reader*, Falmouth: Urbanomic, 2014; *e-flux journal*, Vol. 46, June 2013, at e-flux.com; and Gean Moreno (ed.), *Dark Trajectories: Politics of the Outside*, Miami, FL: [NAME] Publications, 2013.

22 "There is another world, and it is this one," was a slogan much used in the anti-globalization movement. It probably comes from Paul Éluard, *Donner à voir*, published in 1939, which can be found in his *Oeuvres completes*, Vol. 1, Paris: Gallimard, 1968, p. 986.

23 Mark Fisher, *Capitalist Realism: Is There No Alternative?*, Winchester: Zero Books, 2009. The term could be traced back to German artists such as Sigmar Polke and others from the mid 1960s.

24 See Amy Wending, *Karl Marx on Technology and Alienation*, Basingstoke: Palgrave Macmillan, 2011.

1. Alexander Bogdanov

1 Robert Service, *Lenin: A Biography*, New York: Pan Macmillan, 2000, p. 190.

2 See Dominic Pettman, *Human Error: Species Being and Media Machines*, Minneapolis, MN: University of Minnesota Press, 2011, and Giorgio Agamben, *The Open: Man and Animal*, Stanford, CA: Stanford University Press, 2004. The concept of population, incidentally, is also handy for not making too