MOLECULAR COLONIALISM

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Consumption and Growth under Climate Austerity

The recent acquisition of Monsanto agrochemical and agricultural biotechnology corporation by Bayer chemical and pharmaceutical company is symbolic of a crucial moment in the course of planetary politics. The growing demand for food has allowed intensive agriculture to be promoted globally. These modes of food production take up methods of monocultural production that began in colonial regimes, and saw their growth intensified with the industrial revolution, in what was a planetary agroeconomical turn with a major impact.

Targeting key ingredients such as corn or soya that have a wide application in many derivative products used in the food industry, a handful of multinationals such as Monsanto jumped into the chain of the food industry and patented seeds, chemical herbicides, GMOs, and pesticides. These products intervene directly in cultivation methods to enhance crop production rates but signs of a cartel-type domination of the market have also begun to appear.[1] And as a result of this widespread genetic modification of key elements in the food chain these corporations are intervening directly in the natural cycles of life and ecosystems, thus implicating their genetically-modified seeds in the natural world and the causal interrelations of the food cycle.

The modes of intensive monoculture promoted by these corporations, such as the absence of crop rotation, cause an increase in the risk of pests and require aggressive pesticides (also produced by them) that in their turn exhaust the land and make soil infertile and profoundly destabilize agricultural rhythms.[2] Pesticides rich in nitrogen and phosphorus have accelerated the acidification of soil and the

oceans,[3] and have led to a loss of biodiversity over the past decades, while the use of neonicotinoid insecticides in corn plantations has also been associated with the decrease of the bee population.

Moreover, the implication of this agricultural regime has also created a debt economy for farmers related to the increase in GMO seed prices, despite the market domination by these corporations. In the case of countries such as India where most crops are still produced by small farmers and a big portion of the population is vegetarian, this was a tragic move, as it created major debt loops that deregulated the market and caused a regime of dependency that resulted in a major suicidal tendency among small farmers, as has been cautiously pointed out by environmental activist Vandana Shiva.[4]

The merge between the two giants, Monsanto and Bayer, makes explicit the relations between health care research, genetic patenting, and food consumption. With it, a top-down pyramid of biosovereignty is taking shape that stretches beyond the nation state and governs a macroeconomical panorama. In particular, it discloses an interrelated ecosystem of products that both create and offer remedies for contamination under the arch of the same company: quality control and environmental fitness assessment of food production, prevention, and healing of diseases, and research into future therapeutics.

Furthermore, multinationals like Bayer and Monsanto have over the last two decades become further empowered by international trade and investment agreements such as the NAFTA (North American Free Trade Agreement) signed in 1994 by the US, Canada, and Mexico; and more recently the TPPA (Trans Pacific Partnership Agreement)

signed in 2016 by twelve of the Pacific Rim countries, the CETA (Comprehensive Economic and Trade Agreement) signed in 2016 by Canada and the twenty-eight EU states, or the TTIP (Transatlantic Trade and Investment Partnership), which is currently under discussion between the EU and USA. The TTIP envisions the reduction of regulations for trade and big business in an unprecedented move that will allow corporations to sue governments over contract infringement and challenge national environmental policies, by putting forward market measures that go against the goals signed at the COP21 where nation states committed to a reduction of greenhouse gas emissions by 80 percent by 2050.[5]

In allowing the intensification of rapacious power structures between corporations and their host countries, the neocolonial intentions of such agreements become evident. Before, colonial regimes in the Western world were implicated in the notion of race and territoriality by their exchange of people as currency, and use of military control and cartographic knowledge of colonial territories to maintain their sovereign control on foreign land. Nowadays, the emerging power structures that take shape move beyond the horizon of the individual and the geographic into the infinitesimal domain of the gene and the molecule.

Body as Corporate Territory

At the present moment, bodies can no longer be understood as finite unities, but instead as distributed networks of corporate agency. The colonial influence of big business over populations extends its outreach beyond the limits of visibility, invading the chains of biological evolution

with its vampiric quality. Navigating through the breaches of law, capitalism transgresses the ethical limits of earth democracy while operating through a surveillance mode of action that ruthlessly infiltrates populations through policy-making lobbying. As patented GMO genes are absorbed into our bodies in a proprietary relationship of biological subjugation, the body itself becomes an expanded, multiple infrastructure, where intervention can happen at many different scales. Moving bodies become fluid cartographies that cross different juridical regimes.

The mechanisms of an administration of life have their roots in a history of implementation of pervasive measures, such as the regime of hygienization imposed over the colonies, demographic management such as birth control and one-child policies due to overpopulation fears, or the Global Vaccine Action Plan pushed forward by the World Health Organization (WHO).[6] In his detailed writings on the topic, Eugene Thacker recalls, after Foucault, that colonialism began the "biologization of the state" we currently live under,[7] a moment when statistical forms of knowledge are applied in monitoring the population, used in management and the prediction of evolutionary conditions, a period defined by "a significant move away from earlier notions of the state grounded in territory."[8] Bodies become expanded territories for sovereign intervention, where the managerial hand of the State has a say about the liability of one's biorhythms. If in Mark Fisher's *Capitalist Realism* population monitorization is associated with the regulation of affects and expectations, contributing to the suppression of difference and revolt under widespread neoliberal imposition,[9] Thacker's work on the politics of biometrics points to the fact that this

monitorization itself incites new forms of governance both at the molecular level, and through channels as vast as those of big data circulation. This wide scope then informs areas as different as jurisdiction or scientific predictions regarding the genetic evolution of life.

To this effect, the modes of collection, analysis, and distribution of information become just as relevant as the programming languages of the data megastructures that circumscribe the world, that should be also subjected to legal scrutiny. Along with the positivist predominance of statistical forms of knowledge, data provides the groundwork for a mode of governance that directly intervenes on the relation between information and matter. As Thacker argues, this happens precisely at a time when the field of ethics is extended to computer code, just as the public disclosure of DNA becomes the main basis for intervention into physical reality.

On Unprecedented Ground: The Financialization of the Molecule

The heyday of DNA study we currently live in allows not only for a wider medical understanding of disease helping explain morphogenetic reactions, but has unveiled an unprecedented ground for intervention into and transformations on the level of genetic encoding. Coincidently, the cracking and public dissemination of the genetic codes of humans, plants, and animals gave way to an exponential rise of biological patents, as currently "nearly 20 percent of the human genome is now privately owned,"[10] and an investment in a managerial viewpoint of bodily politics as a form of endocolonialization.[11]

At the same time, the methodologies of administration operation of finance have broadly invaded the spectre of the bios, with their modes of analytical and statistical treatment of reality, that deploy methods of computation as modes of assessment of performance, capability, and evolution of life.

The proprietary status of these patents originated from a supremacist framing of terrestrial ontologies, where the assumption of human speciesism is pivotal. Moreover, it is responding to a market logic that addresses life as a commodity to be manipulated and replicated under the volatility of market consumption.

The last century helped produce eighty thousand new molecules that were subsequently released into the ecosystem and whose behavior we can not fully predict. Scientists such as Giuseppe Longo are concerned with both the creation of anthromes, new molecules produced by man, and the circulation of GMOs and their effects; especially given that the endocrinal crisis that our systems are living with has increased rates of infertility and cancer development.[12] The interaction between hybrid agents such as anthromes and natural organisms was chain motivated in an unprecedented manner, leading to the unexpected behavior and evolution of the various components and an unpredictable turn out of its mutations.

A new arena of capitalizable potential is thus unravelled, bringing along with it a strategic cartography of intervention in forms of life. As large sums of transnational capital are allocated in the administration of planetary health, enzymatic reactions have become financialized spaces. But how can one address the intricacy of this managerial relation we have developed with matter without

bringing to the foreground the very aims beneath the tools that we operate with? This neoliberal approach to the natural realm as a potential platform for profit leads irrevocably to ethical controversy, in which life is handled as information: a language that can be coded and decrypted.

Indeterminacy in the Era of Algorithmic Dictatorship

Over the last decades, we have been witnessing the development of algorithmic forms of intelligence growing in parallel with genetic research, and often in its alliance. How has our comprehension of algorithmic thought evolved in recent times, and how does that encompass the complex, not to mention ethical problems, of intervening in the course of life and evolution having as its basis the language of computation?

The domain of the algorithmic sovereignty imposed in the study of evolution has gained exponential investment from the side of the technological gatekeepers and legislation enforcing agencies, giving unprecedented power to lobbyism and the business made over the administration of life. Furthermore, the fields of health care and food production have provided the necessary market for the further exploitation and the manipulation of nature, resulting in what is today a profit-oriented encoding of the cycles of the natural world. This may have no end in sight, unless we invest in an honest debate about the colonial relation of the human intervention in the natural sphere, question the forms of ethical and creative reasoning implicated in the tools that we use, and create spaces of dialogue between different epistemologies.

The integration of algorithms and big data analysis in the biological sphere brings with it a greater belief in

technopositivism and modes of statistical thought, regimes of assessment of the natural world, and a form of governance. These are essentially modes of prediction and analysis that treat matter as a finite and computable object. Here, mathematics also plays an essentially normative role that can be quasi-reductionist, as Giuseppe Longo has pointed out in his critical work on the synthesis function of mathematics. Furthermore in "the deluge of spurious correlations in big data" Longo addresses also the inclusion of indeterminacy in big data analysis, revealing how randomness is imminent in big databases: "Very large databases have to contain arbitrary correlations. These correlations appear only due to the size, not the nature, of data. They can be found in randomly generated, large enough databases, which as we will prove implies that most correlations are spurious. Too much information tends to behave like very little information."[13]

Concomitantly, algorithms inspired by the natural world, and ideas of natural selection and evolution have been developed; such is the case with the genetic algorithms, designed to evolve and further adapt to the environment, and problem-solve in this process of self-generation. Genetic algorithms are a subset of evolutionary algorithms that mimic actions inspired in biological operators, such as cells, seeking to optimize the responses to the problems of their environments by self-generating, and encompassing processes of mutation and natural selection. Yet, in the exercise a certain translation and mirroring of natural processes is assumed to be inherently good, often accompanied by the belief that everything is potentially computable and predictable. In the process what is rejected is the fact that life is itself an open system, non-linear, and exponentially chaotic.

The increasing integration of algorithmic models of computation for the management of life reveals an incomprehension about the adaptive potential of nature as an open system, incomputable as such, and that often eludes the predictive assessments that try to model living systems. Such models have to include indeterminacy at its core. Furthermore, I would argue that genetics, just as algorithms, must include "the probability of incomputability" similarly to how, in her analysis of algorhithmic architectures,[14] Luciana Parisi advocates for a probability which is indeterminate and does not respond only to finite problems nor to the direct adaptability to external stimuli,[15] but is increasingly entropic.

Life is in itself more incomputable than we are currently able to predict, and its propensity for constant mutation is incalculable as it stands, being a complex system. Any regulative approach based on mathematical synthesis negates nature's propensity to further bifurcate and complexify its evolution through hybrid paths. Our belief in genetic computability and its absolute control leads us to intervene in ecosystems in a manner that has lead us to a regime of conflicted biopolitical sovereignty. But how does one reject the colonizing force of algorithms and genetic predators as the subtext of all matter, if not by legally regulating programming and genetic intervention?

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Unexpected genetic deviations have proved the indeterminacy of matter and its mutations at alarming levels, biting back at the colonizing hand of man. Take for example the appearance of the the Zika virus in Latin America and the

worldwide wave of panic generated by it. First recorded in 1947, the Zika virus has since 2015 been reported by the WHO as spreading through the Americas in broad scale, having mutated into an apparently more complex form that causes microcephaly in newborns of infected mothers. The scientific community is still trying to search for the source of this mutation, however some as-yet unproven theories relate this outbreak to a GMO mosquito colony of infertile female mosquitos released to fight dengue in 2015, of which a small percentage may have still carried disease. The WHO has been researching the mutation of the mosquito and its link to a pesticide implemented by Sumitomo–Monsanto company, while others attribute the proliferation of the infected insect to a mutation of a hybridized infertile mosquito colony created in an attempt to regulate the dengue fever.[16] Despite the unproven nature of these allegations, Brazil reacted by spraying its citizens with more pesticides, and states such as Florida continue to ponder the insertion of a new type of genetically-modified mosquito to control the fertility rate of the Zika-carrying insect in their land,[17] the *Aedes aegypti*. While envisaged by health regulating agencies as an optimistic step, this decision seems nonetheless like it will contribute to the enlargement of the snowball effect, for which the end game is an infinite capitalization of its consequences.[18]

Are our constitutions strong enough to act preemptively, or are we allowing code developers, patentors, and laboratories to operate at the forefront of natural selection?

Notes

1. Ken Roseboro, "The GMO Seed Cartel," *The Organic and Non-GMO Report*, February 1, 2013. Accessed October 15, 2016, http://www.non-gmoreport.com/articles/february2013/the-gmo-seed-cartel.php.

2. Union of Concerned Scientists, "Expanding Monoculture, 8 Ways Monsanto Fails at Sustainable Agriculture: #4," *Union of Concerned Scientists*, January 9, 2012. Accessed October 15, 2016, http://www.ucsusa.org/food_and_agriculture/our-failing-food-system/genetic-engineering/expanding-monoculture.html#.WC-7NGXPzrc.

3. Will Steffen et al., "The Anthropocene: conceptual and historical perspectives," *Philosophic Transactions of the Royal Society A*, January 31, 2011. Accessed June 12, 2013, http://www.rsta.royalsocietypublishing.org/content/369/1938/842.

4. "Instead of controlling pests, Bt. Cotton has led to the emergence of new pests and a thirteen-fold increase in pesticide use. The farmers suffer twice over. Costly seeds and costly chemicals push them into debt trap, and debt pushes them to suicide. 200,000 farmers have committed suicide in India since 1997. Most of these suicides are concentrated in the cotton belt, and 95% of cotton is now Monsanto's Bt. Cotton." Vandana Shiva, "Making Peace with the Earth," *Sydney Peace Foundation*, November 3, 2010. Accessed October 10, 2016, http://sydneypeacefoundation.org.au/wp-content/uploads/2012/02/2010-SPP_Vandana-Shiva1.pdf: 8.

5. Arthur Nelsen, "Leaked TTIP energy proposal could 'sabotage' EU climate policy," *Guardian*, July 11, 2016. Accessed July 12, 2016, http://www.theguardian.com/environment/2016/jul/11/leaked-ttip-energy-proposal-could-sabotage-eu-climate-policy.

6. World Health Organization, "Global Vaccine Action Plan 2011–2020." Accessed October 8, 2016, http://www.who.int/immunization/global_vaccine_action_plan/en/.

7. Eugene Thacker, *The Global Genome: Biotechnology, Politics, and Culture* (Cambridge, MA: MIT Press, 2005) 151.

8. Ibid.

9. "In his book *The Selfish Capitalist*, Oliver James has convincingly posited a correlation between rising rates of mental distress and the neoliberal mode of capitalism practiced in countries like Britain, the USA and Australia. In line with James's claims, I want to argue that it is necessary to reframe the growing problem of stress (and distress) in capitalist societies. Instead of treating it as incumbent on individuals to resolve their own psychological distress, instead, that is, of accepting the vast privatization of stress that has taken place over the last thirty years, we need to ask: how has it become acceptable that so many people, and especially so many young people, are ill? The 'mental health plague' in capitalist societies would suggest that, instead of being the only social system that works, capitalism is inherently dysfunctional, and that the cost of it appearing to work is very high." Mark Fisher, *Capitalist Realism* (Winchester: Zero Books, 2009) 19.

10. "Over the past thirty years, more than 3,000 gene patents have been granted. Nearly 20 percent of the human genome is now privately owned. The U.S. Patent and Trademark Office has issued nearly 50,000 patents involving human genetic material. Patents have been granted for microorganisms, genetically modified plants and animals, stem cells, tissue and many other living things." David Bollier, "The Chakrabarty Case and the Ownership of Lifeforms," *David Bollier: News and perspectives on the commons* October 5, 2012. Accessed February 10, 2016, http://www.bollier.org/blog/chakrabarty-case-and-ownership-lifeforms.

11. "Biocolonialism is also a phenomenon within First World countries, where the pharmaceutical industry stands to gain the most returns. This 'endocolonization'—not only of the body but of medical practice itself—focuses on the ways in which the biological body can be turned into a value generator, either in drug development or through novel medical techniques such as gene therapy." Eugene Thacker, *The Global Genome: Biotechnology, Politics, and Culture* (Cambridge, MA: MIT Press, 2005) 157.

12. "The discrete-computational outlook has not helped us (or has not permited us) to detect the role of endocrine perturbators of the 80.000 (sic) artificial molecules that we produced in the twentieth century.

These were mostly presumed to be innocuous, below arbitrarily imposed individual thresholds, since not stereo-specific (not in exact physico-chemical-geometric correspondence) and thus unable to interfere with molecular-computational cascades, necessarily stereo-specific, going "from DNA to RNA to proteins" (the Central Dogma of molecular biology), and with hormonal pathways. It should be noted, indeed, that exact molecular stereo-specificity was deduced, against experimental evidence that were already available (since 1957, see Elowitz and Levine 2002; Raj and Oudernaaden 2008): it is 'necessary', as Monod (1972) puts it, for the transmission of computational information and for the genetic programme to function. Thus, negating the role of context in genetic expression and hormonal control, the consequences (direct and indirect) of the nite combinations of said 80.000 molecules on the organism and on the chemical ecosystem of the living have receded from view. Cancer incidence has grown in the last half century, across all age groups, jointly to the halving (sic) of the average density of human spermatozoa in Western countries (Diamanti-Kandarakis et al. 2009; Soto and Sonnenschein 1999, 2010). As for cancer, the failure of the y years old, DNA centered, molecular approach has been recently acknowledged even by one if its founding fathers, Weinberg (2014)." Giuseppe Longo, "Conceptual Analyses from a Grothendieckian Perspect e Reflections on Synthetic Philosophy of Contempora Mathematics by Fernando Zalamea," trans. Fabio Gironi, in *Speculations VI*, December 12, 2015. Accessed February 8, 2016, http://static1.1.sqspcdn.com/static/f/1181229/26726714/1449753798363/Speculations_VI_Longo.pdf?token=1xxfj1KQBowRiD8MmVxjMWv7W0Q%3D.

13. Giuseppe Longo and Cristian S. Calude, "The Deluge of Spurious Correlations in Big Data," in *Algorithmic Randomness*. Accessed November 30, 2016, http://www.academia.edu/23450804/The_Deluge_of_Spurious_Correlations_in_Big_Data in Objective and Epistemic Complexity in Biology: 1.

14. Luciana Parisi, *Contagious Architecture: Computation, Aesthetics and Space* (Cambridge, MA: MIT Press, 2013) 13.

15. "First-wave cybernetics followed traditional scientific protocols in considering observers to be outside the system they observe. [...] The second wave of cybernetics grew out of attempts to incorporate

reflexivity into the cybernetic paradigm at a fundamental level [...] The third wave swelled into existence when self-organization began to be understood not merely as the (re)production of internal organization but as the springboard to emergence." N. Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (Chicago: University of Chicago Press: 1999) 11.

16. Mike Adams, "Zika virus outbreak linked to release of genetically engineered mosquitoes ... disastrous unintended consequences now threaten life across the Americas," *Natural News*, February 1, 2016. Accessed September 20, 2016, http://www.naturalnews.com/052824_Zika_virus_genetically_engineered_mosquitoes_unintended_consequences.html.

17. Jessica Glenza, "Florida cleared to release genetically modified mosquitoes in Zika fight," *Guardian*, August 5, 2016. Accessed October 10, 2016, http://www.theguardian.com/world/2016/aug/05/florida-genetically-modified-mosquitoes-zika.

18. Bill Berkrot, "Zika vaccine race spurred by crisis and profit potential," *Reuters*, October 4, 2016. Accessed October 5, 2016, http://www.reuters.com/article/us-health-zika-vaccines-analysis-idUSKCN12409V.

Further References

Susan Schuppli, "Deadly Algorithms" in *Radical Philosophy* (September/October 2014). Accessed November 30, 2016. http://www.radicalphilosophy.com/commentary/deadly-algorithms.

Vandana Shiva, "The War against Earth," in *The State of Things*, ed. Marta Kuzma, Pablo Lafuente and Jaques Rancière (Oslo: Office for Contemporary Art, 2012).

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