The Laboratory Planet

Planetary Peasants

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Between 1961 and 2016, the number of people on Earth doubled, and the global area of cultivated land per capita was halved[1]. According to United Nations projections, the world's population is set to increase by 2 billion over the next 30 years, from 8 billion today to 9.7 billion in 2050[2]. In these new conditions, how can the Earth remain habitable for all?

Laboratories for habitable futures

In 2007, we created the journal The Laboratory Planet, based on the intuition that from a "factory planet" it was necessary to move on to the analysis of a "laboratory planet" – where "acceptable risk" is the adjustment variable for experiments on a scale of 1. We postulated that 1945 was the symbolic date of this transition, with the atomic bomb as marker and symptom. We were just beginning to hear talk of the "Great Acceleration" and the Anthropocene, but it was already clear that the construction of environmental monitoring, with its apparatus ranging from micro-sensors for terrestrial measurements to satellite observation, stemmed directly from the technologies and methodologies of Cold War nuclear deterrence. Without the deployment of this military-industrial complex, we now know that it would have been impossible to define either the Great Acceleration or the Anthropocene. The continuous monitoring of Earth System indicators is an indirect legacy, as are the institutions themselves, and the technocracy that accompanies them. Our aim is to highlight the "Anthropocene Bomb"[3] that exploded at the turn of the 1950s, and the "alien" character of computers' conquest of the Earth[4].

But as science historian Christophe Bonneuil points out, awareness of the "planetary turn" goes back much farther than the view of the Earth from the Moon, or the founding of the International Union for Conservation of Nature at the end of the Second World War. He reminds us that, while the historian community now concedes the existence of a "consciousness of globality" since at least the 16th century, "regimes of planetarity" remain largely unclear[5]. And as Gayatri Chakravorty Spivak wrote in 1999, "The globe is on our computers. Nobody lives on it"[6].

Since then, the Indian philosopher has been encouraging us to move away from the technicist vision of the "globe", perceived as invading and controlling the planet, towards a "planetary" gaze that would encounter this other that we inhabit, as well as the othernesses with whom we cohabit on Earth.

At a time when living conditions are deteriorating ever further, ecologically as well as socially and humanly, this is the direction we propose to take. In this issue, we imagine a peasant and neo-peasant future, invented by planetary peasants, organized in diverse territories, cultivating biotopes that are more heterogeneous, more democratic, and therefore more habitable than those of imperial cities. This issue opens up to a central section on the recent Soil Assembly initiative, and develops some of the experiences, reflections and surveys collected within this emerging network.

The futurism that guides us here – that of the peasants who have demonstrated their millennia-old ability to shape living landscapes, and that of the neo-peasants who are inventing new forms of agricultural, pedagogical and social arts – is in solidarity with the Earth and its destiny. It does not claim to accelerate the biosphere and living beings, as we accelerate the evolution of the technosphere with capital. Rather, it seeks to thicken the living, to densify beings, to increase their consistency.

This issue of La Planète Laboratoire is not leaving behind the dying Earth for the Moon or the stars, it is looking toward our soils, our hedgerows, our forests, our mountains, our deserts, our rivers, our seas and the teeming world that inhabits them.

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(1) It decreased from around 0.45 hectares per inhabitant in 1961 to 0.21 hectares per inhabitant in 2016 (FAO, Land use in agriculture by the numbers, 07 May 2020).

(2) https://www.un.org/fr/global-issues/population

(3) Ewen Chardronnet, "La Bombe Anthropocène", AOC, 28 March 2024.

(4) See previous issues of *The Laboratory Planet*.

(5) Christophe Bonneuil, "Der Historiker und der Planet. Planetaritätsregimes an der Schnittstelle von Welt-Ökologien, ökologischen Reflexivitäten und Geo-Mächten", in Frank Adloff et Sighard Neckel (dir.). *Gesellschaftstheorie im Anthropozän*, Frankfurt, Campus, 2020, pp. 55-92.

(6) Gayatri Chakravorty Spivak, I*mperatives to Re-Imagine the Planet* (Vienna: Passagen Verlag, 1999), 44. Cited in Jennifer Gabrys, "Becoming Planetary", *e-flux Architecture*, 2018.

Planetary Peasants

ALEXANDER KLOSE

Spring 2025 marks the 500th anniversary of the German Peasants' War. According to Marxist historiography it was the first revolution on German soil, the "climax of the early bourgeois revolution, [and] one of the greatest class battles in the age of feudalism"[1]. Consequently, this event played an important role in the political memory of the German Democratic Republic (GDR). The East German 5 Mark banknote showed a posthumous portrait of Thomas Müntzer (1489-1525)[2], the reformist preacher and militant antipode to Martin Luther, whose sermons, writings and deeds are closely identified with the Peasants' War. Other types of revolutions have reshaped the world since, though, namely socio-technological ones. In industrialized regions, both the peasantry and their agricultural labours have dramatically declined in importance, both in terms of the numbers of people involved and in terms of their political representation.

Scholars from Marx/Engels onward have predicted the death of peasantry. The categorical distinction between city and countryside, each sphere traditionally with its own rights and ways of being, has been eaten up by the dynamics of planetary urbanization. Yet, the primary materials for food are still produced on agricultural sites, and the planet's current condition of multiple ecological crises was manufactured in urban-industrial agglomerations and infrastructures, as well as on farms and fields, through the accumulation of the doings of modern machines and human beings, animals and plants[3].

At the same time, peasants around the globe, though operating under very different conditions, are currently struggling for their rights — to earn a living, to continue traditions, to stay on their lands. The following text tries to string together some of those diverse and partly contradictory ties that define this complex situation.

In the self-mythologization of the early GDR, the "land reform" of 1945 — i.e., the expropriation of large landowners and (alleged) collaborators of the Nazi-regime and the redistribution of their land among small farmers — and the subsequent collectivization of land and work in agricultural production cooperatives (LPG: Landwirtschaftliche Produktionsgenossenschaft) was presented as the completion of the Peasant's War: "Via defeats and victories in the class struggle, the peasants' path through the centuries has led to socialism. The oppressed class of feudal farmers became the socialist class of cooperative farmers under the leadership and alongside the working class in the GDR."[4]

After the end of the GDR in 1990, many of the LPG's vast agricultural lands were bought by multinational agribusinesses and, more recently, bypassing existing laws that are intended to prevent this, by real estate speculators. Seen from today, the period of "actually existing socialism" in agriculture turned out to be a rationalisation measure that prepared the land for total neoliberal plundering by real existing capitalism[5]. This was a dialectical dynamics somewhat comparable to the historical role of the German Peasants' War as a trailblazer for early capitalism and a punitive counter-reformation: in its aftermath, the peasants, freed from serfdom, were now in possession of themselves and their labour power, but not much more (except for a tighter grip on their wives and children as a result of extended property rights); at the same time, they were deprived of their traditional rights to common property as well as traditional entitlements to community services provided by the landlords[6].

Allstedt Castle, an important Müntzer location,
surrounded by fields with energy, plants, traces of mining, and windmills.

Technical and scientific revolutions

Parallel to political and socio-economical turns, a potentially even more profound revolutionary dynamic has transformed things around the globe, on all political sides: the development of modern agronomy and the mechanization, industrialization and "chemicalization"[7] of agriculture. A key figure was the doctor and agriculture researcher Albrecht Daniel Thaer (1752 – 1828), who is considered the originator of the science of agronomy. He began to work for the Prussian state in 1804, founding agricultural research and teaching facilities north and east of Berlin. In 1809 he published the first of four volumes of his seminal *Principles of Rational Agriculture* (*Grundsätze der rationellen Landwirtschaft*). Another key figure was the economist, agronomist and farmer Johann Heinrich von Thünen (1783 - 1850), one of Thaer's first pupils, who pioneered principles of business administration in agriculture. Later, the centre of agronomical research in Germany moved south, to the fertile grounds of the Prussian province of Saxony (which is also where Thomas Müntzer came from, and where the Werkleitz festival 2025 *Planetary Peasants* is focused). Here, Julius Kühn (1825-1910) worked as the founding professor at the institute for agronomy at Martin Luther University Halle. His experiments on the monocultural cultivation of crops, which he called "eternal rye", and which started in 1862, continues to this day.

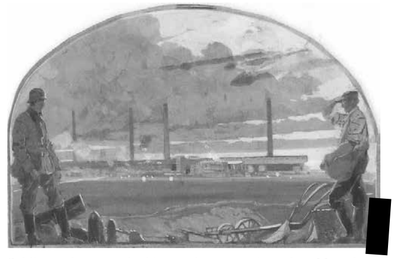
In the mid 19th century, the region between Magdeburg to the North, the Harz mountains to the West, Merseburg to the South, and the Saale river to the East had become one of the world's leading regions for sugar production refined from sugar beets. The world market price for sugar was determined at sugar boards in London and Magdeburg — an encounter of colonial and continental productive economies. What used to be one of the most important colonial commodities (and a luxurious one for most) — sugar made from cane grown on slave-operated plantations in tropical regions — was turned into a kind of staple food. Production exceeded demand, so new demands had to be created to normalise an ever-increasing sugar consumption. For some time, sugar was the most important export of the newly found German Empire. Prussian Saxony went through a phase of agriculture-led industrialization. The implementation of the infrastructure needed to produce sugar, namely mills and refineries and the machines used in them, attracted a saccharine geography of factories for the production of specialized agricultural machines and for food production (bread, cakes, chocolate). This economic success in competing with the colonial economies and breaking free from the dependency on their main goods, such as sugar, rubber or saltpetre, developed into an important trope in the self-historization of the "belated nation" of Germany.

Without significant access to the colonial production regions, it had to apply principles of an "inner colonization": intensified agriculture, industrialized production and innovation. Popular publicists, including the non-fiction author and early Nazi propagandist Karl Aloys Schenzinger, repeated this trope time and again, especially with regard to the historical development and significance of the chemical industry[8].

The rendering of an "agricultural biological chemistry" and the development of the first artificial phosphate fertilizer by the chemist Justus von Liebig (1803-1873) in the 1840s, who taught and lived in Gießen in the state of Hesse-Darmstadt and later in Munich, were a pillar of the emerging chemical industries of Germany and other nations. When the new "Badische Anilin und Soda Fabrik" (BASF) Ammonia Synthesis Factory Merseburg opened in 1916, as the first in a network of chemical production plants later known as the "chemical triangle" formed by Bitterfeld/Wolfen, Leuna and Buna, its production was directed towards ammunition for the ongoing war (replacing the saltpetre from Chile that was no longer accessible because of the British Naval Blockade) and towards artificial fertilizers for an intensified agriculture.

From *Gerechtigkeyt* to Climate Justice

The invention and large-scale deployment of artificial fertilizers, together with the mechanization and industrialization of work, instigated by far the most profound changes in agriculture since its invention. Following tractor tracks and artificial fertilizer traces of phosphor, potash and nitrogen leads us to regions around the globe and across political borders. The same machines were put to work, the same substances used, even in the strictly politically divided countries on both sides of the "iron curtain". The tracks and traces of agriculture's industrialization lead to fields of maximized productivity, as well as to exhausted and eroded soils and to areas of excessive accumulation akin to the dead zones that result from the over-nitrification of runoff water close to ocean estuaries around the globe. Today's planetary condition is to a significant degree defined by such—human-made, intended or unintended—migration of organic and inorganic substances linked to agricultural activities: plants and animals, but also, and mainly, chemical compounds such as CO2 or ammonium-nitrates and their accumulation in the Earth's ecosystems.



Soldier and peasant looking at the ammonium plant Merseburg, Fritz Bersch 1917-18.

Today, agricultural machines in the former LPG plantations of Müntzer's homeland are tracked and controlled by GPS, and the yield of local fields is sold at international stock exchanges such as the Chicago Board of Trade. Peasantry, like the working class, seems to have dissolved into milieus. So, the question might be, what do our present and future have in common with the causes of the Peasants' War? Seen from a planetary perspective, it quickly becomes clear that the adversities of peasant labour have only shifted — whether to the exploitation of seasonal workers, very often migrant workers without passports and legal rights, who are still made necessary in many agricultural processes, despite all mechanizations and automatizations, or to regions of the world where crop failures and extreme weather events continue to be existentially threatening. Besides, the end of serfdom in European countries was paralleled by the enslavement and forced migration of millions of people to work on plantations in the American and Asian colonies. Their insurgencies and anti-colonial struggles carry many of the aspects of the European peasants' wars, both in their contents and in their outcomes. The "Plantationocene" holds up under post-colonial conditions[9]. The question of justice today must be considered not only on the level of classes or strata of one society, but also between the populations of rich and poor countries. The concept of climate justice, as it is discussed and demanded today, emphasizes how much people within and between societies benefit from industrialization, and the price they pay for it: pollution, devastation, or the loss of habitats due to climate change.

Feeding the world-to-come in a fairer way still requires revolutionary action, or so it seems. Given the expansion of capitalist conditions in the development of the world system in the last 500 years, but especially in the last decades, many ecological thinkers and activists around the globe interpret the rule of ownership and capital as being at the core of all environmental problems. The question of agricultural land for a steadily growing world population is still decisive for territorial conflicts and geopolitics, and will increasingly become so in the climate-changed future. The expansion of plantations reduces rainforests and displaces human communities. On the other hand, the growth of settlements, industries and infrastructures is destroying agricultural land worldwide. These circumstances, as well as the expansion of markets, the ongoing industrialization of agriculture, and the threat to rural areas due to changing climate conditions, have resulted in a massive increase of migratory movements of people leaving soils that don't feed them anymore. In order to end the destructive dynamic of this age of "capitalist realism" and open up perspectives for sustainable, post-capitalist, post-profit maximizing future societies, as advocated by the Japanese neo-marxist Kohei Saito[10], we must once again turn to the agrarian sphere and its modes of (re)production as a main source of inspiration, energy, and revolutionary dynamics.

This text is an overworked and extended version of the initial concept for the Werkleitz festival 2025 exhibition Planetary Peasants by Daniel Herrmann, artistic director of Werkleitz, and Alexander Klose at Kunstmuseum Moritzburg, Halle. For more information on the exhibition see: https://werkleitz.de/en/planetarische-bauern-ausstellung. It is part of the state exhibition of Saxony-Anhalt/Germany in 2025, titled Gerechtigkeyt – Thomas Müntzer & 500 Jahre Bauernkrieg (Justice – Thomas Müntzer & 500 years of Peasants' War).

(1) Manfred Bachmann, „Zum Geleit", in: Staatliche Kunstsammlungen Dresden (ed.), *Der Bauer und seine Befreiung. Ausstellung aus Anlaß des 450. Jahrestages des deutschen Bauernkrieges und des 30. Jahrestages der Bodenreform [The peasant and his liberation. Exhibition on the occasion of the 450th anniversary of the German Peasants' War and the 30th anniversary of the land reform]*, Dresden 1975, p.7; translation by authors.

(2) The idea was to show an ascending line of important individuals in a revolutionary history, starting with Müntzer on the 5 Mark note and culminating in Lenin on the 500 Mark bill.

(3) For an analysis of agriculture as the initial force that led into today's anthropocenic condition, see: David R. Montgomery, *Dirt: The Erosion of Civilizations*, Oakland 2012.

(4) From the concept of the Committee of the Council of Ministers of the GDR for the 1975 exhibition on the German Peasants' War and land reform in Dresden, quoted after Bachmann, ibid.; translation by author.

(5) see Ramona Bunkus and Insa Theesfeld, *Land Grabbing in Europe? Socio-Cultural Externalities of Large-Scale Land Acquisitions in East Germany*, in: *Land* 2018, 7, 98.

(6) Silvia Federici, *Caliban and the Witch. Women, the Body, and Primitive Accumulation*, Brooklyn/New York 2004; Eva von Redecker, *Revolution für das Leben. Philosophie der neuen Protestformen*, Frankfurt/Main 2023.

(7) „Chemisierung" is the German neologism used to describe the application of chemically produced substances to enhance productivity and reliability in agricultural production.

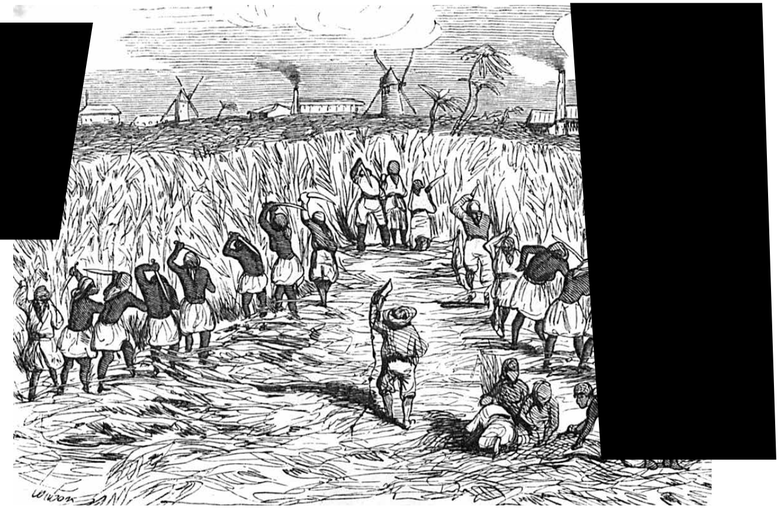
(8) His books *Anilin* (1936) and *Bei IG Farben* (1951), about the advent of the German chemical industry, sold a million copies during the NS-time and in post-war West Germany.

(9) see Maan Barua, *Plantationocene: A Vegetal Geography*, in: *Annals of the American Association of Geographers*, 0(0) 2022, pp. 1–17.

(10) See Kohei Saito, *Marx in the Anthropocene. Towards the Idea of Degrowth Communism*, Cambridge, New York, Melbourne 2022.

Plantation Planet

FEDERICO LUISETTI



Slaves cutting cane in the French colonies, engraving published in 1842. From *Les français peints par eux-mêmes: le Nègre* (Page 321).

The most enduring planetary laboratory is the Plantation, an institution and mode of existence that took hold of the Earth during colonial times and is still shaping soils, bodies, and minds across continents. As of today, the planet – in particular the Global South – is occupied by large-scale industrial monocrops for agro-fuels, animal feed and textiles, by palm oil and eucalyptus plantations, by tropical cash crops and monocultures of corn, soybeans, wheat, rice of a limited variety of genotypes, farmed by heavy machinery on chemically-engineered soils[1].

We may not live in the Anthropocene, as recently decided by the Subcommission on Quaternary Stratigraphy of The International Union of Geological Sciences[2], but we certainly inhabit the Plantationocene, a neologism introduced in 2015 by Donna Haraway[3], at the culmination of decades of postcolonial histories of the agro-political world-order of plantation societies, which spread across the Atlantic and then in the rest of the world through a combination of monocultures and slavery[4]. The source of the Earth's "colonial inhabitation"[5] is the coerced labor of humans, plants, animals, and microbes in the plantations, the radical simplification of living natures, and the relocation of the genomes of breeding plants and animals across continents. Forced labor in the plantation has designed a planetary matrix of land grabs, massacres, land clearing, and the exploitation of reproductive forces of the living – instead of regenerative practices of farming and forestry, accelerated and forced reproduction of some species and the extermination of others[6].

Terricide

The Spanish term used by activists of the *Movimiento de Mujeres Indigenas por el Buen Vivir* (Indigenous Women's Movement for Good Living) to describe the effects of the Plantationocene is *terricidio* ("terricide"), a constellation of "epistemicides, genocides, ecocides, culturicides, femicides that have occurred throughout the history and the colonial present": "With the word terricide we name our pain and the devastation suffered by the territories, our spirituality and our bodies, because in it all the ways of murdering life that the Western system has are encrypted."[7] For the ecofeminist activist Vandana Shiva, agribusiness and knowledge-based monocultures are one and the same, since ecocides and epistemicides go hand in hand, and "dominant knowledge destroys the very 'conditions' for existence of alternatives, just as the introduction of monocultures destroys the very conditions for existence of different species."[8] The plantation economy is inseparable from a "monoculture of the mind," a one-dimensional system of thought based on Western principles of human exceptionalism and psycho-biological individuality, which the Jamaican philosopher Sylvia Wynter calls a "monohumanist conception of the human."[9]

At the origin of the Plantationocene's monohumanism is the ancient separation of persons and things, a poisonous gift of Greek philosophy, Roman law, and Christianity, ingrained in the fabric of European slave societies[10]. Western personhood has detached the *persona* from the *res*, with the goal of conflating humanity and ownership, personhood and mastery over slaves and their bodies, reduced to objecthood. Appropriation of something – that thus becomes a *res* – by someone who claims to be a subject – a *persona* – is the foundation of modern Western legal and political thought. In the Americas, the proprietorial *persona* has stripped Black, Native, and non-white people of their land and humanity, reducing an entire continent into *terra nullius*.

The legal history of the Western persona reinforces the analytics of New World slavery laid out by Black and decolonial studies. For Saidiya Hartman, the order of knowledge to which personhood belongs is "enabled by proprietorial notions of the self: humanity and individuality acted to tether, bind, and oppress."[11] The archetype of this view is John Locke's theory of property. A beneficiary of the slave trade and the founding father of liberalism, Locke co-authored *The Fundamental Constitutions for the Government of Carolina* (1669) as secretary to the Earl of Shaftesbury, one of the Lords Proprietors of Carolina, and he actively justified the link between individual personhood and private ownership. According to Locke, land cultivated in common by Amerindians cannot be considered appropriated until it is enclosed by the individual[12]. Personhood as a center of experience is inseparable from the juridico-political connotations of being an individual possessor who alienates other humans and non-humans from this essential freedom. In his *Essay Concerning Human Understanding* (1689), Locke is straightforward: "Person … is a Forensic Term appropriating Actions and their Merit; and so belongs to intelligent Agents capable of Law, and Happiness and Misery."[13] Where decolonial activists see terricides, Locke perceives intelligent legal persons capable of law and happiness for themselves, and misery for others.

Soil Insurgency

Over the course of the nineteenth century, the monohumanist conception of personhood denounced by Sylvia Wynter has produced a biologized and economized account of the human, a bio-economic compound. Framed within Malthusian resource scarcity and Darwinian natural selection, "Western and Westernized global selves"[14] functioned simultaneously as subjects of natural history and political economy. Through "biological liberalism," a colonial constellation of scientific, legal, and cultural practices managed to produce what Maurizio Meloni portrays as an "unprecedented technology of isolation, privatization and protection of the body that makes of its inner milieu a source of freedom and individuality in the face of mutating external environments."[15] The biological rearticulation of liberal political philosophy has constituted a "threshold of biological individuality"[16] that separates the modern Western body and its internal regulating system from an Outside that has become the Environment, the Non-Body of the Earth.

Against this monoculture of the mind, Sylvia Wynter advocates for a return to the teachings of Frantz Fanon, who contested "liberal humanism's biocentric premise of the human as a natural organism and autonomous subject."[17] Fanon's decolonial overcoming of Western humanism converges with multispecies ecologies, which politicize the awareness that biological life is not an autonomous kingdom of competing species surrounded by dull matter. Biologically, we have never been individuals. As Anna Tsing puts it, "human nature is an interspecies relationship," life is animated by subtle relations that cross the inorganic conditions of human existence, soils, fungi, plants, and animals. Geochemical processes, co-evolution, and multiple involutions of species constantly dissolve biological boundaries and individualities.

Despite centuries of monohumanism and plantations, the body-territory of the Earth has not been fully reduced to bioeconomic units. As an alternative to the Plantationocene, decolonial activists embrace the forces harboured in the pluriversal bodies of the Earth, the modes of existence of non-human subjects, of earth-beings unencumbered by the biocentric normativity of monohumanism[18]. The protagonist of the decisive struggle for re-existence in the Plantationocene is soil, the cradle and grave of organic life, where bodies and inorganic matter meet and exchange their properties, nurturing and destroying each other in a restless process of decay and regeneration[19]. Populated by beings of all kinds – stones and leaves, insects, roots, water, air – soil is the stage on which the planetary drama of life and nonlife has been unfolding for the last 450 million years.

When soil is not destroyed by chemical agriculture and plantations, earthworms act as geo-activists and earth-designers, as was already clear to Charles Darwin, who dedicated his last published work to these crawling, digging, and swallowing earth-beings: "All the vegetable mould over the whole country has passed many times through, and will again pass many times through, the intestinal canals of worms."[20] Thanks to the digestion of earthworms and their "mental power"[21], the planet is not a pure geological being of crystalline rocks. Organic matter and stones flow downwards, decomposed by earthworms into nutrients for life. Whereas Charles Darwin celebrated the subjectivity of earthworms after observing pots that he kept in his home near London, Vandana Shiva places soil care at the core of Navdanya farm, an agroecological research and activism hub in Uttarakhand in the foothills of the Himalayas. In her decades-long battle against the Green Revolution, Vandana Shiva has allied with a "soil community" of "over one thousand species of invertebrates that may be found in a single m2 of forest soils" and "millions of individuals and several thousand species of bacteria" that dwell in a single gram of lively soil[22].

In Karl Marx's reflections on the colonization of Irish soil[23] and Amilcar Cabral's political agronomy in Guinea-Bissau[24], in contemporary agroecologies and food sovereignty movements, it is a soil insurgency that liberates the Earth from Western and Westernized global selves.

Credit: Movimiento de Mujeres Indígenas por el buen vivir

Federico Luisetti is a philosopher and Professor of Italian Studies and Environmental Humanities at the University of St. Gallen (Switzerland).

(1) Monocultures cover 80% of the world's 1.5 billion hectares of arable land.

(2) quaternary.stratigraphy.org/working-groups/anthropocene/

(3) D. Haraway, N. Ishikawa, S. F. Gilbert, K. Olwig, A. L. Tsing & N. Bubandt, "Anthropologists Are Talking – About the Anthropocene" *Ethnos*, 2015.

(4) See E. Williams, *Capitalism and Slavery*, University of North Carolina Press, 1944 and G. Beckford, *Persistent Poverty: Underdevelopment in Plantation Economies of the Third World*, Oxford University Press, 1972.

(5) M. Ferdinand, *Decolonial Ecology: Thinking from the Caribbean World*, Polity, 2022.

(6) A. Hopes & L. Perry, *Reflections on the Plantationocene: A Conversation with Donna Haraway and Anna Tsing, Edge Effects Magazine*, Nelson Institute, University of Wisconsin–Madison, 2019.

(7) *Campamento Climático: Pueblos contra el Terricidio organizado por el Movimiento de Mujeres Indigenas por el Buen Vivir*, in "Deliberó en el Lof Mapuche Pillán Mahuiza el Campamento Climático Pueblos contra el Terricidio", *Revista Resistencias*, 18 feb 2020 (translation by Arturo Escobar). Latin American indigenous and feminist movements speak of Cuerpo-territorio ("body-territory"), an indissoluble assemblage of individual and collective, physico-affective bodies.

(8) V. Shiva, *Monocultures of the Mind: Perspectives on Biodiversity and Biotechnology*, Zed Books, 1993.

(9) *Sylvia Wynter: On Being Human as Praxis*, ed. K. McKittrick, Duke University Press, 2015, 21. My understanding of the connection between monohumanism, terricide, and pluriversal ontologies owes to the work of Arturo Escobar, in particular to his forthcoming article entitled *Planetary Universalisms / Planetary Terricide: A Pluriversal Perspective.*

(10) R. Esposito, *Persons and Things: From the Body's Point of View*, John Wiley & Sons, 2015.

(11) S. Hartman, *Scenes of Subjections. Terror, Slavery, and Self-Making in Nineteenth-Century America*, Oxford University Press, 1997, 5–6.

(12) B. Arneil, "*John Locke and America: The Defence of English Colonialism*", Oxford University Press, 1996, 141.

(13) J. Locke, *An Essay Concerning Human Understanding*, Thomas Basset, 1690, II. Xxvii, 26.

(14) *Sylvia Wynter: On Being Human as Praxis*, 67

(15) M. Meloni, "*Provincializing Metabolism*", Somatosphere, January 18, 2020.

(16) Ibid.

(17) S. Wynter, *1492: A New World View*. In V. Lawrence Hyatt and R. Nettleford, eds., *Race, Discourse and the Origins of the Americas*, Smithsonian Institution Press, 1996, 44.

(18) See F. Luisetti, *Nonhuman Subjects. An Ecology of Earth-Beings*, Cambridge University Press, 2023.

(19) See J. F. Salazar, C. Granjou, M. Kearne, A. Krzywoszynska, M. Tironi, eds. *Thinking with Soils: Material Politics and Social Theory*, Bloomsbury Academic, 2020.

(20) C. Darwin, *The Formation of Vegetable Mould through the Action of Worms, with Observations on their Habits*, John Murray, 1881, 4.

(21) Ibid. 3.

(22) V. Shiva, *Agroecology and Regenerative Agriculture: Sustainable Solutions for Hunger, Poverty, and Climate Change*, Synergetic Press, 2022, 105.

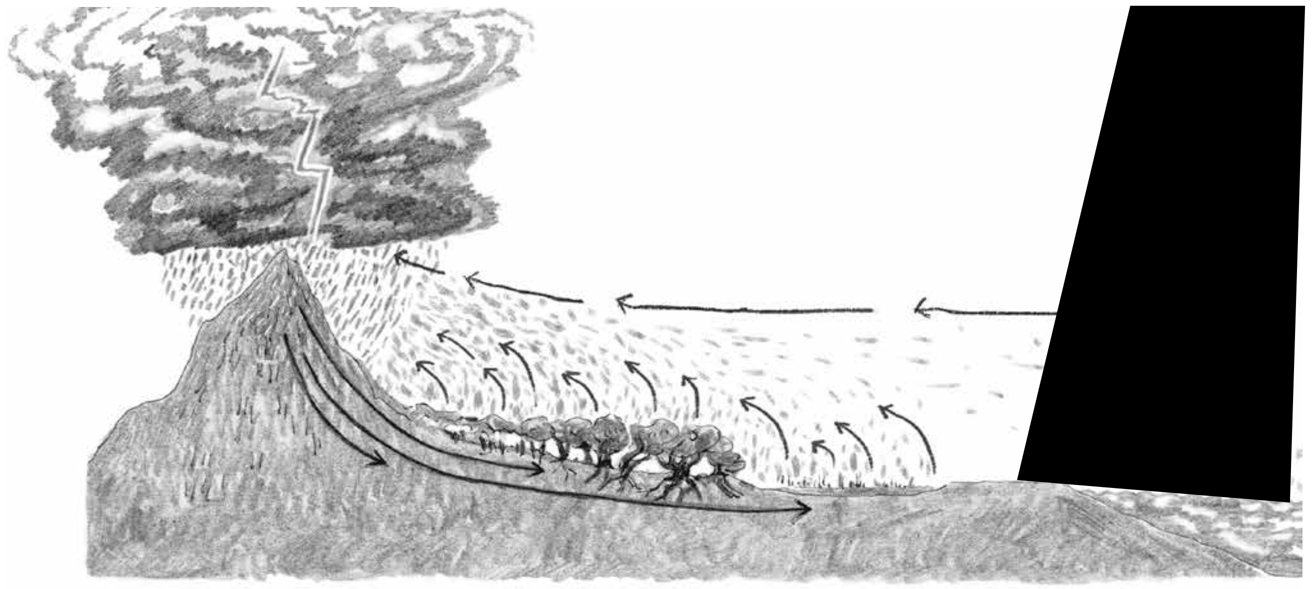
(23) E. Slater, "Marx on the Colonization of Irish soil" (MUSSI Working Paper No. 3), Maynooth University Social Sciences Institute, 2018.

(24) F.M. Carreira da Silva & M. Brito Vieira, "Amilcar Cabral, Colonial Soil and the Politics of Insubmission," *Theory, Culture & Society*, 2024.

Soil, Plants and Thunderstorms

JULIAN CHOLLET

Soil is not only the foundation of life for all land-based organisms, it has an astounding influence on the climate. The general narrative on climate change is slowly transitioning from an almost exclusive focus on greenhouse gasses, to a more holistic perspective that includes the active role of ecosystems. Millán M. Millán's in-depth research into changes in land use on water cycles in the western Mediterranean encourages us to not only transform agricultural practices, but to regenerate landscapes and reimagine society.



Depiction of a typical western Mediterranean water cycle. The arrows show the evaporation of water from the sea, swamps and forests, the wind carrying the vapor into the mountains and the returning flow of water back into the soils and swamps.

(Illustration by Akvilė Paukštytė based on a drawing by Millán M. Millán)

Today, most of the Iberian Peninsula is severely threatened by desertification, and especially its southern regions are extremely dry. But it has not always been like that. The eastern coastal lowlands were once characterized by swamps, the hills and mountain ridges by open forest. Let's look at the formation of summer storms in such a landscape: with a gentle morning breeze, moist air sweeps in from the sea, rises on the slopes of the mountains and forms dark clouds that eventually give birth to a thunderstorm. Yet, this meteorological ballet is not solely orchestrated by physics and geology - biology also plays a pivotal role. "Soil is the womb and the vegetation the midwife," Millán Millán said about his decades-long research on these water cycles. The generation of rain clouds depends on the vitality of the land. First of all, additional water is needed. It is pumped up from the soil by the plants and evaporates on the surface of their leaves. A single tree can charge the clouds with several hundred liters of water per day. The other ingredients for a proper thunderstorm are 'seed crystals': tiny organic particles such as pollen, fungal spores and bacteria that allow water vapor to form droplets or ice crystals. Energetically speaking, it's an open system – heat can escape into higher strata of the atmosphere – but when it comes to the water, it is cyclical, meaning that most of it returns to the soil and sea.

Although the Romans had already started draining swamps and cutting trees, the land stayed green and lush until the advent of large-scale "development" in the 20th century. Nowadays, the shorelines of Spain are crowded with cities, towns and beach resorts, while further inland, the native woodland and most of the traditional farming systems have been replaced by industrial agriculture. As a direct consequence of this shift in land use, thunderstorms have become rare. When they occur, the sudden deluge poses a significant challenge. Because sparse vegetation is unable to absorb sufficient water and already degraded soil is vulnerable to erosion, the impacts are profound. This "second leg of human-induced climate change", as Millán calls it, should not be underestimated. Changes in land use lead to major disruptions of local weather patterns, but they also exaggerate climate anomalies elsewhere. While the Iberian Peninsula dries out, the water vapor travels far into the continent and can eventually induce floods in central Europe. Lack of sweet-water influx furthermore increases ocean salinity and affects the so-called "Atlantic- Mediterranean salinity valve" at the Strait of Gibraltar, which in turn can change the formation of low-pressure systems and storms on a much larger scale.

The western Mediterranean water cycle is a great example of the interconnectedness of soil, ecosystems and climate. Similar dynamics unfold across the globe, from central Chile to California and western Australia. All these regions are severely affected by land degradation - catalyzed by urbanization and industrial agriculture - which leads to a downward spiral of erosion, desertification and extreme weather events. Millán's research shows how the current focus on greenhouse gasses limits our understanding of climate change. Even if we could stop all emissions today and restore the atmosphere to pre-industrial CO2 levels, this would not revive previous water cycles and climate systems. It's not enough to transition to 'green' energy and organic agriculture. What we really need is to regenerate landscapes on a large-scale. Then as a side effect, these ecosystems would absorb CO2 and store it in the soil.

Fortunately, powerful strategies and methods already exist - especially agroforestry in all its forms. Adapted to the local soil and climate, integrating trees within fields and meadows creates some of the most productive and ecologically valuable landscapes worldwide. Silvopastoral systems, which utilize livestock grazing between trees, were developed thousands of years ago, and in some places they are still around. In Spain these mosaic landscapes are known as Dehesa (in Portugal as Montado) and although in decline, they still occupy around 3.5 - 4 million hectares of land in the southern Iberian Peninsula. Most styles of agroforestry not only provide food and wildlife habitat, but also wood for construction and heating. At the same time, they stop erosion, retain humidity in the soil, increase humus and fuel local water cycles. Instead of degrading the land, these systems grow more productive and resilient every year. With each new millimeter of humus, the soil's capacity to absorb and store water increases; microorganisms build their complex networks of nutrient recycling and distribution; fungal hyphae weave their webs between plants and extend their tentacles into the depths.

This shift requires policies that support and protect small-scale local agrarianism, access to land and resources for people who are willing to build these systems. It requires an education that teaches us to cultivate the necessary skills. And above all, it requires a different way of thinking, new virtues and values. Imagine a society where almost everyone is involved in growing food. Humans once again become a part of the ecosystem, and nature transcends the confines of designated conservation areas. Such a society gives rise to entirely different landscapes - where monocultures fade into obscurity, trees and shrubs proliferate, and the soil recovers. These landscapes create a livable climate, birth their own thunderstorms, cycle the water, and at the same time nourish their inhabitants.

"A common argument against agroforestry is that it requires more manual work than industrial agriculture. This might be true for all sustainable food systems, especially for the most productive and ecologically valuable. But once established, a food forest needs less maintenance than almost all other types of farming. Indeed, the meaning of 'work' changes: from performing externally determined tasks to a creative flow that synchronizes your activities with those of your family, friends, neighbors and the larger community. This kind of work can help us find meaning in our lives. It might even catalyze profound societal change. Food forests, community-supported agriculture and local distribution networks have the potential to transform not only our landscapes, but our relationship with the natural world, with our food, and with one another.

Julian Chollet is a (no)mad scientist, curious student and informal teacher with a background in molecular biology.

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Projects

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https://sarsarale.org

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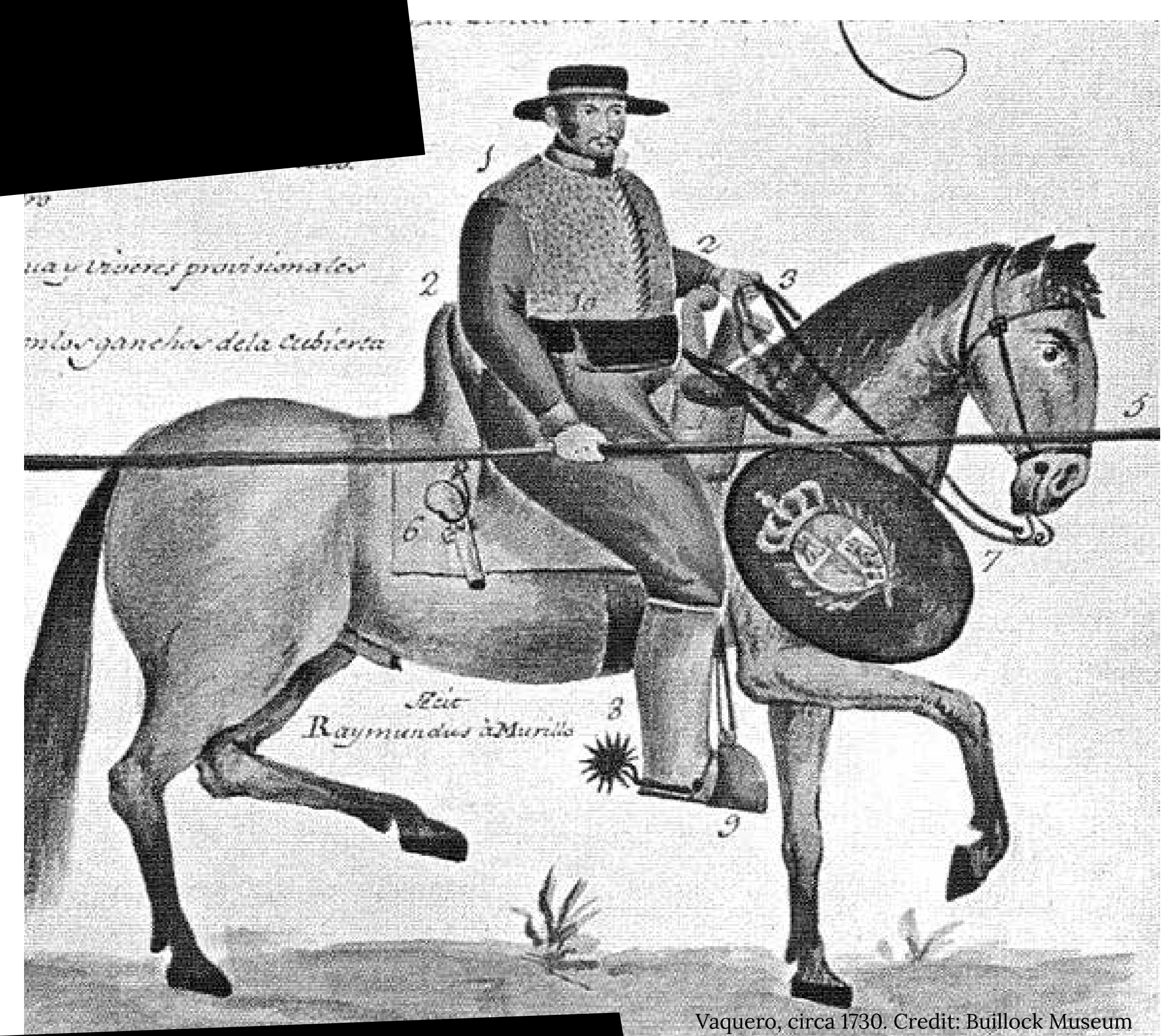
https://bio4climate.org

The Longhorn, from Spanish Colonists to Texan Cowboys

Using extensive pasture as a biotechnology of conquest

EWEN CHARDRONNET

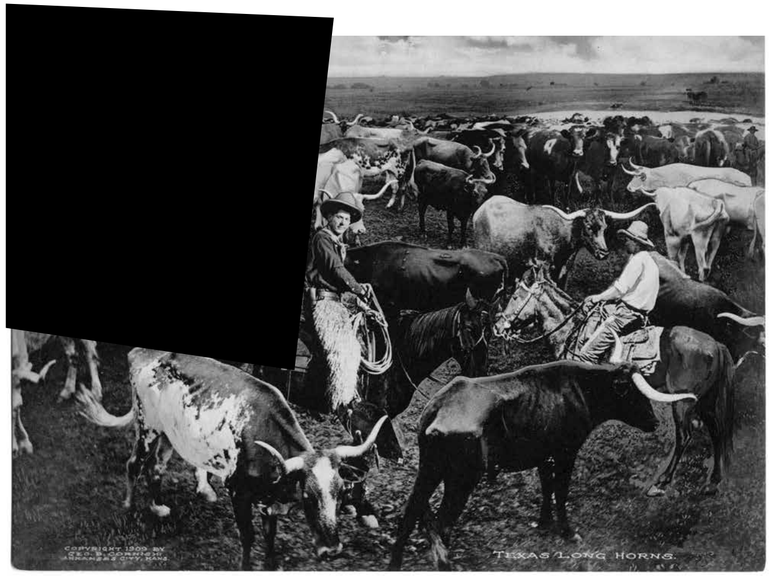
Texas Longhorn cattle, whose trophies are displayed as a state symbol, originated from Spanish colonization[1]. Gradually colonizing the Americas from Patagonia to Missouri with the help of horses and oxen, Spain practiced "cattle release" to the feral state and then implemented its extensive farming methods in territories that had never before known livestock. Cattle, in particular, provided invaluable assistance to the European conquest, but also had dramatic consequences for native populations and ecosystems: "They spread so rapidly that they sometimes preceded the occupation of the land, ahead of the conquerors: Cattle often constituted the 'pioneer fringe'; herds of cattle disrupted fragile indigenous societies, shaking up their way of life and their ancient economy, which was purely agricultural or based on simple gathering; above all, they provided inexpensive food for the new arrivals, who would have had difficulty finding sufficient and suitable food in these empty lands. Sometimes cattle were the decisive factor in the conquest; in certain regions, they were released to repel the natives, as was done against the barbaric Chichimecas of northern Mexico."[2]



Vaquero, circa 1730. Credit: Buillock Museum

In the 16th century, as Spanish colonies expanded in Mexico, Iberian cattle arrived in greater numbers and multiplied. The Spaniards moved to the far north of the territory, motivated in particular by their quest for the legendary Cities of Gold. They reached present-day California, then the Grand Canyon and Zuñi territories, the Rio Grande, and even the Wichita territories near present-day Kansas City in the 1540s. In 1598, Don Juan de Oñate led a new expedition north of the Rio Grande, this time claiming the territory in the name of the Spanish Crown as New Mexico. Sadly remembered for having massacred some 1,000 Pueblo Acoma Indians (Áak'u in the Keres language) a few months later, he also allowed 7,000 heads of Iberian cattle to cross the Rio Grande.

The Longhorn's Iberian ancestors adapted particularly well to the harsh climate of Texas's vast drylands. The species had the great advantage of being very self-sufficient for extensive breeding, with little or no need for human intervention. They reproduced in a quasi-feral state, caring for their young themselves in the pastures. They could use their long horns to defend themselves from wolves. Ranchers approved - and even encouraged - cross-breeding and adaptations of the Longhorn, seeing the species as a kind of technology (or biotechnology, in evolutionary terms) ideally suited to the territory for its assigned function of transforming grass into beef[3], the staple diet of the settlers. Thus, it continued to assume its role as a technology of conquest, providing food security for the European colonies that were progressively encroaching on native lands. In 1680, Texas officially became a Spanish colony – at least on paper. The colonized territory remained



George Bancroft Cornish (1867-1946), Texas Long Horns, 1909, 101 Ranch and Burroum Ranch, Del Rio, Val Verde County, Texas. Source: DeGolyer Library, Southern Methodist University

that of the Apaches, Comanche, Tonkawas or Karankawas, and the colonial settlement served more as a large buffer zone between the Spaniards and the French of Louisiana. Barely 1,000 *Tejanos* lived there in 1762, when Louisiana was annexed by Spain. By the end of the century, Spain had claimed the current western half of the United States, from the Canadian border to Baja California, from St. Louis to New Orleans. However, seeking to populate the vast drylands of Texas, Spain encouraged new settlers by offering them the title of *hidalgo* or financial benefits, and also allowed Anglo-Saxons to settle there as well. The latter were recruited by agents known as *empresarios*, such as Moses Austin and his son Stephen, who later gave their name to the capital of Texas.

In 1821, when Mexico gained independence from Spain, there were nearly 3.5 million long-horned oxen in what is now Texas. The species had adapted into what can be considered the Texas Longhorn we know today. After Spanish rule ended and ranchers had departed the land, the herds were left in a feral state. The territory attracted even more English-speakers seeking fortune by capturing this neglected manna, which could then be considered game. Texas Ranger, Texas Senate member and Confederate Colonel John Salmon Ford described the country between Laredo and Corpus Christi as inhabited by "innumerable herds of mustangs and ... of wild cattle ... abandoned by the Mexicans when they were ordered to evacuate the country between the Nueces and the Rio Grande by General Valentin Canalizo ... the abandoned horses and cattle caused the Texans to raid this territory."[4] The Anglo-Saxons became the majority in the territory, and after ten years of latent conflict with Mexico, the Anglo-Saxon settlers and their Tejano allies rose up and won independence in 1836. Another ten years later, Texas was finally annexed by the United States in 1845. During this period, Longhorns continued to roam the land. By the 1860s, an estimated 5 to 6 million feral cattle were roaming the state of Texas.

After the Civil War, many discharged soldiers turned to Texas Longhorn cattle to earn a living. War veterans rounded up unbranded cattle and branded them as their own. Thus was born another Texas breed: the Texas cowboy. The ensuing cattle drives helped revive the state's economy and became the driving force behind the legend of Anglo-Saxon cowboys and the trails they followed, which in turn served to consolidate the new American hold on these territories. And yet, contrary to popular belief, Tejano and Mexican vaqueros made up a good quarter of these cowboys, and Black cowboys - usually former slaves or children of former slaves - also accounted for another quarter of cattle workers between the 1860s and 1880s.

Cattle also existed in the eastern U.S., but they were relatively few, and their meat was expensive. Land and fodder were expensive, and during the Civil War, the Union army had greatly depleted the region's agricultural resources. By contrast, Texas cattle had spent the war doing what they had been doing for centuries - fending for themselves and reproducing. The herd had exploded. But the federal blockade of the Mississippi River during the war had prohibited exporting cattle to the North, where prices were much more attractive than in the South[5].

In the post-war years, Longhorns, which could endure long journeys without water, were rounded up and driven by cowboys along various Texas trails to Kansas City, where they were loaded onto railcars and shipped to Chicago. This soon gave way to a vast mass-slaughtering industry, correlated with a distribution system allowing refrigerated beef to be sold throughout the nation. Between 1867 and 1880, an estimated 10 million cattle were driven north. They were sometimes fattened for a winter in Colorado or Wyoming, then marketed, loaded onto trains and shipped to St. Louis and Chicago. In 1884 alone, for example, 625,000 Longhorns were shipped to markets in Chicago, St. Louis and elsewhere, while a further 300,000 were taken directly to northern ranchers for fattening[6]. The species played a crucial role in Texas' recovery from the Civil War.
After reaching its peak in the late 1880s, the Longhorn population nearly became extinct. The barbed-wire enclosure of ranches encouraged ranchers to turn to European breeds that were more suited to supervised breeding and the market. Breeds such as the Angus, Hereford and Shorthorn replaced the species that had made the pre-industrial livestock market such a success. What remained of the Longhorn was exploited for leather until the species almost disappeared from the Texas plains. It was restored in the 1920s, however, as an icon of Texan culture.

Ewen Chardronnet is a journalist, author, curator and artist, co-founder of The Laboratory Planet.

(1) A study of the species' genetic heritage conducted by the University of Texas in Austin in 2013, shows that they are direct descendants of the first cattle brought by Christopher Columbus on his second voyage in 1493. The study also describes the complex ancestry of the descendants of cattle from the Iberian Peninsula. Around 85% of the Longhorn genome is "taurine", i.e. derived from the ancient domestication of wild aurochs that took place in the Middle East between 8,000 and 10,000 years ago. The remaining 15% of the genome is inherited from zebus, which come from the other ancient domestication of aurochs, in India. These bos taurus indicus, which often feature a characteristic hump on the back of the neck, spread to Africa and from there to the Iberian Peninsula during the Al-Andalus period between the 8th and 13th centuries. Emily Jane McTavish et al., New World cattle show ancestry from multiple independent domestication events. PNAS, March 25, 2013.

(2) Pierre Deffontaines, "L'introduction du bétail en Amérique Latine", *Cahiers d'outre-mer*. N° 37 - 10e année, Janvier-mars 1957. p. 11

(3) Joshua Specht, The Rise, Fall, and Rebirth of the Texas Longhorn: An Evolutionary History, *Environmental History* 2016, 21:2, 343-363

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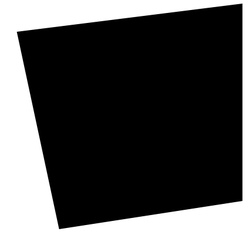
The Nutmeg's Curse, a story of biopolitical wars, terraformation and extermination

Interview with Amitav Ghosh

PAULINE BRIAND



Amitav Ghosh is a fiction and non-fiction writer from India. In his *Ibis* trilogy, he used opium trade and opium war to address the worldwide impact of colonialism and globalization. He revisits this topic in his latest essay *Smoke and Ashes, Opium's Hidden Histories* (2024), in which the opium poppy is granted its own agency. Ghosh's work focuses on capitalism in the common narrative about climate change and the extinction crisis, in order to delve into their often less visible and more pervasive causes – colonialism and imperialism. From book to book, since *The Great Derangement: Climate Change and the Unthinkable* (2016), Ghosh has created new narratives that provoke readers to think about these crises from a radically different perspective. With *The Nutmeg's Curse, Parable for a Planet in Crisis* (2021), the author examines the resource curse, anchoring it in the 17th century Banda Islands and retracing its path from the Indian Ocean to the Americas and Europe.

P.auline Briand: How would you define the resource curse?

Amitav Ghosh: To understand this we must first ask ourselves what is a 'resource'? This is a conception that grows out of a certain kind of extractive economy. Before the 16th and 17th centuries, even in Europe people didn't think of their products as mere resources that existed only to be bought and sold. Everything was deeply connected to ways of life, and they were invested with meaning. Even today, products are not necessarily regarded as mere 'resources' that can be reproduced everywhere, as was the case in the colonial world. The Dutch, for example, would never have said to themselves: 'Well, down in Tuscany they make some nice wines, which could be very profitable. So why don't we just go down there and kill all the people and grab their land and their grapes?' This would not have occurred to them because they would have understood that the wines of Tuscany would not have been what they were if not for the specific properties of the land, and the technical knowledge of the people who lived on and cultivated the terrain.

It is important to recall that many, if not most of the Earth's products were once thought of in the way that we now think of the wines of Tuscany or the cheeses of Parma. Take the nutmeg tree, which produces both nutmeg and mace. Historically the nutmeg tree was found only on the Banda archipelago, which is tiny and very remote. But nutmegs and mace had been circulating around Eurasia and Africa since antiquity, and they had made the Bandanese a prosperous and flourishing community. Over millennia the Banda Islands attracted traders from many distant places: China, India, the Arab world and Africa. Many of those traders spent years living in the Bandas, and they would have been perfectly familiar with the techniques for cultivating nutmeg trees; nor would it have been at all difficult for them to smuggle out seeds and seedlings, to grow in their own countries. Yet none of them ever did that. Instead, for centuries, they undertook the difficult and dangerous journey across the Indian Ocean to the Banda Islands. The reason for this was simply that a nutmeg wasn't a nutmeg unless it was from the vicinity of the Banda Islands, grown or processed by the Bandanese, just as the wines of Tuscany cannot be considered Chianti unless they are grown by people who are intimately connected with the land and its products.

It is exactly these connections that came to be ruptured by colonialism, as it evolved after the conquest of the Americas. Suddenly everything in the world was up for grabs – botanical species, minerals, and, of course, people as well. So the Dutch decided that they could simply kill or enslave all the Bandanese and take over the nutmeg trade, which is what they proceeded to do in 1621. This was conceivable for them because similar things were happening at the other end of the Dutch Empire, in North-eastern America, where indigenous populations were also being subjected to exterminatory violence. It is in this context that everything in the world is suddenly available for extraction – botanical species, minerals, and, of course, people as well. The nutmeg tree becomes a profit-generating machine to be planted wherever the colonizer pleases, and the people who have nurtured it over centuries become completely expendable. So the nutmeg tree, which had brought great blessings on the people of the Bandas, ultimately became a curse, leading to their elimination from the land. In that sense, the Bandanese were among the first to suffer the 'resource curse', and today's planetary crisis is nothing other than the unfolding of that curse on a planetary scale. In the Andes, millions of indigenous people were killed in silver mines; in the Amazon, similarly thousands died in order to produce rubber for European colonizers. Today many parts of the world that produce oil or gas have been virtually destroyed because they possessed resources – this has happened in the Middle East and in West Africa. In a way, they have all been through the process that destroyed the Banda Islands hundreds of years ago. That was why I centered the book on the nutmeg tree: because this story condenses a much wider history.

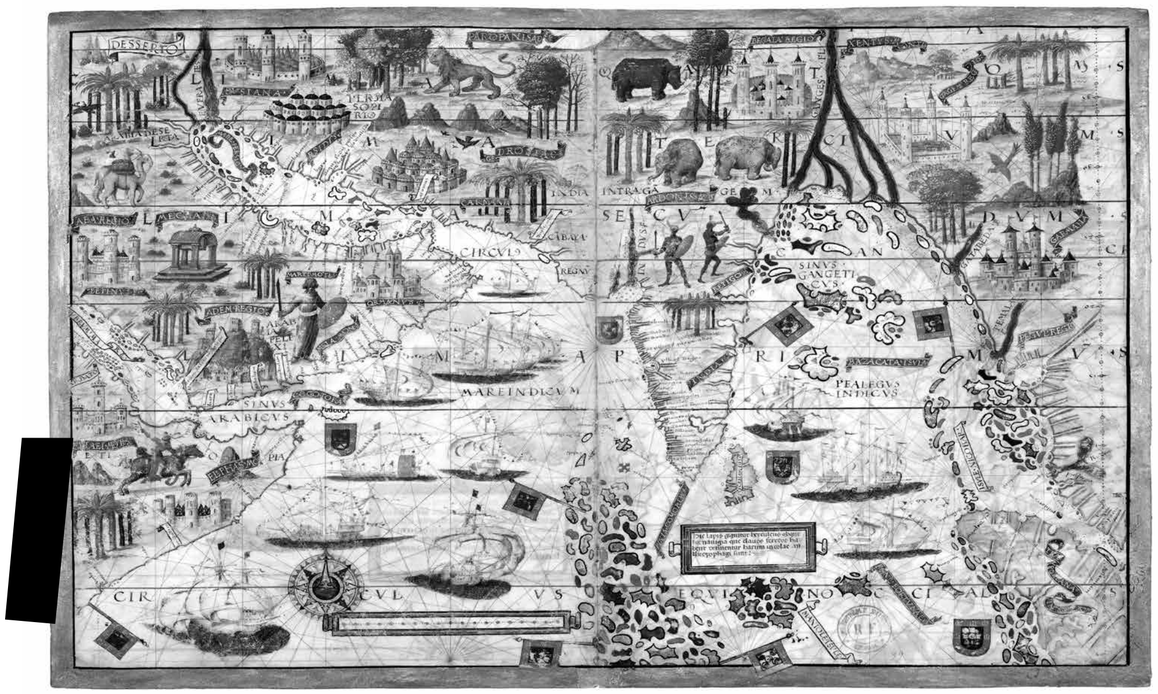
Why is it important to give voice to the agencies of the nutmeg tree, nutmeg and mace?

Over the last few years, I have come to be more and more interested in the idea of 'botanical agency'. My most recent book, Smoke and Ashes is about the history of the opium poppy. With this plant especially it is difficult to completely ignore the feeling that a certain kind of intelligence is at work. In fact, the opium poppy has managed to evade every human attempt to contain and limit it. In Afghanistan, the American army – the mightiest military machine in human history – was essentially defeated by a very humble-looking flower. And of course, fossil fuels, which are nothing other than

fossilized botanical matter, have also established a stranglehold on human societies. Stories are quintessentially the domain of human imaginative life in which non-humans once had voices, and where non-human agency was fully recognized and even celebrated. To make this leap may be difficult in other, more prosaic domains of thought, but it was by no means a stretch in the world of storytelling, where anything is possible. We cannot, after all, expect economists or historians to tell stories in which non-humans are accorded personhood or agency; this is simply not possible within the framework of their disciplines – or, indeed, any academic discipline. But, storytellers uniquely have since antiquity been given a license by society to imagine non-human agency. *The Odyssey*, *Iliad*, *Ramayana* and so on are all replete with many forms of non-human agency. This license has continued into modern times. Melville's *Moby Dick* is a story of non-human agency. Similarly, Carlo Collodi's *Pinocchio* is basically an imagining of diverse forms of non-human agency. In *The Nutmeg's Curse*, I describe how the Dutch writer Louis Couperus represents all kinds of non-human 'hidden forces' in his novel. Considering that he was writing for a readership which was, even then, extremely rationalist and materialist, you would imagine that his book would not have been taken seriously. But instead, his novel was celebrated and came to be regarded as a classic. This is one example of how the license to represent non-human agency enables storytellers to imagine various forms of agency. Something similar is at work in popular culture even today. If you look at bestselling books and popular movies, you will see that many of them are about zombies, extraterrestrials, vampires etc. – all kinds of non-humans. However, in the course of the 20th century, the literary world essentially rejected the amazing license it had been given and came to focus almost exclusively on human subjectivity. The consequent erasure of non-human voices from 'serious' literature has played no small part in creating that blindness to other beings that is so marked a feature of official modernity. It follows, then, that if those non-human voices are to be restored to their proper place, then it must be, in the first instance, through the medium of stories.

You establish a continuity between the spice trade routes in the Indian Ocean of the 17th century and the "carbon-capitalism" world that we now live in. Do you think this dimension is overlooked by social-science analysts?

As I see it, the central idea of Anthropocentrism – that the Earth is an inert repository of resources that exists primarily to be exploited by (some) humans – had its origins neither in 'Nature', nor in mechanistic philosophies, nor in certain scriptural traditions, as is sometimes argued. Its origins lie, in my view, in the apocalyptic violence that was unleashed by Europeans against their human Others in the Americas and Africa. In particular, it was the violent 'subduing' of the people of the Americas that made it possible for elite Europeans to think of everything on the planet as being available for conquest, enslavement and even extermination, as happened in the Banda Islands. In other words, the same violence that made it possible for elite Europeans to think of their human Others as purely material beings, lacking in reason, thought and agency ('half-devil and half-child' in Kipling's words) also made it possible for them to think of the Earth and its gifts in the same way. Both non-humans and human Others were represented as being fit to be 'subdued' (a word that recurs often in colonial texts). It is important to remember that this kind of violence was also directed at European peasants, who, like farmers everywhere, had many kinds of vitalist beliefs. These ideas were as repugnant to elite European men as the so-called 'paganism' that they encountered outside Europe, and they waged a very bloody war against these beliefs in the form of the crusade against witches (who were, of course, overwhelmingly women). The same kind of repression continued for centuries, being directed at various peasant movements that insisted upon the sacrality of the land and of the rural communities



The Miller Atlas was created in 1519 for the Portuguese King Manuel, the same year that Ferdinand Magellan and his Armada de Moluccas set off on their voyage around the world. These were the first maps to depict the Spice Routes. The atlas is the joint work of cartographers Pedro and Jorge Reinel, Lopo Homem and the miniaturist António de Holanda. It was acquired by the Bibliothèque nationale de France in 1897 by the librarian Emmanuel Miller, and has been named after him ever since.

that lived on it. Nor have these vitalist currents disappeared from Europe. As scholars such as Ernesto di Martino and Jeanne Favret-Saada have shown, they are still very much alive in rural communities – it's just that they are now carefully hidden.

In your book, the concept of terraformation is central to the colonial project. Why is it still relevant today?

'Terraforming' was a very important aspect of the colonization of the 'New World'. When the Europeans saw North America, especially in the beginning, the forests, the swamps, were perceived as hideous. They thought of this land as ugly and unkempt, and they wanted to transform it completely. Very early on, ecological transformation became a very important part of colonialism.

From the 17th century onwards, the English, especially, wanted to transform American landscapes. Within two generations, they managed to make this land into a kind of second England. But what we are seeing today is the unraveling of landscapes that have been terraformed. It's the parts of North America that have been most extensively engineered to resemble European models that are the worst affected by climate change. If you look at California, or southern Texas around Houston and most of the Mississippi River Delta, these are the places where the landscape is literally unraveling. It's clear from the fires sweeping through California that what in fact a sort of profound provocation of the landscape. The same could be said of the southeastern Australian state of Victoria. Many places that were subjected to colonial terraforming are now being devastated by terrible heatwaves and wildfires.

[redacted]

Your book introduced me to the concepts of "slow violence" and "biopolitical wars". Can you tell us about these processes and the many non-obvious actors who play a part in them?

Ah, yes, welcome to the messy, intricate web of our world. It's thrilling, isn't it, to discover these new ways of seeing? Let's untangle the threads a bit.
Slow violence is a concept invented by Rob Nixon. It refers to the insidious kind of violence that creeps in almost unnoticed, like rising sea levels or the slow poisoning of a landscape by industrial waste. It's the violence of neglect, of a system that prioritizes profit over people and planet. We often miss it because it unfolds over decades, even centuries. But the damage it inflicts is profound. Biopolitical warfare is the kind of conflict that occurred during the European colonization of the Americas. A lot of the conquest was actually done through livestock and pathogens, which were sometimes propagated quite deliberately. And that whole thing is very far from over. Those wars of ecological transformation are still going on in Amazonia, because what is at stake is the attempt to turn all of Amazonia into a kind of Midwest. In a sense, climate change can be seen as an extension of the colonial biopolitical wars – it's now a war of the rich against the poor. It's very striking how American billionaires seem to believe that climate change will work in much the same way that terraforming did – that is, it will destroy the lands and livelihoods of non-Westerners. But I think they are mistaken. In an earlier era, colonists were able to control various forces, but this is no longer the case. The atmosphere and the Earth itself isn't taking sides any more – they are striking out against everyone, across the planet.

You quote Ben Ehrenreich: "Only once we imagined the world as dead could we dedicate ourselves to making it so." Could vitalism be a viable response to the crises we are now facing?

All around the world today we see the emergence of movements that reject mechanistic and extractivist conceptions of the relationship between humans and other living beings. It has even been said that the fastest growing religions of today are 'Earth-centered' faiths and practices. As the historian Prasenjit Duara has shown in his book *The Crisis of Global Modernity: Asian Traditions and a Sustainable Future*, there are countless such movements in the Global South, and especially in Asia. Yet, it is probably true that many, if not most earth-centered movements are based in the West, and the reason for that is that things have, in a sense, come full-circle: while the elites of formerly colonized countries such as India and Indonesia are racing to embrace settler-colonial practices and policies (which is none other than neoliberalism shorn of the fancy language), many younger Westerners have come to understand that those practices are leading the world – and especially their generation – to disaster.

This awakening owes a great deal, of course, to the activism of those who have historically borne the brunt of the suffering inflicted by European colonialism – that is, Indigenous and Black people. It is heartening to see what a tremendous effect the Standing Rock movement has had, for instance. Particularly heartening for me is that these movements are not just narrowly political; they also advocate different ways of thinking about humanity's relationship to the Earth. They envision the non-human world as being filled with vitality and agency. There is, I think, increasingly a recognition that the mechanistic philosophies that reigned in the West during the centuries of colonization are really nothing other than ideologies of conquest.

***The Nutmeg's Curse* reminds me of the economist Joan Martinez Allier's book *The Environmentalism of the Poor*, in which he shows how in the Global South, social conflicts often come with environmental conflicts, and that social and environmental justice are intertwined. Is reducing inequality a key priority to address the climate crisis ?**

Reducing inequality is not just a priority, it's the cornerstone of addressing the climate crisis. As you point out, Joan Martinez Allier brilliantly illuminates this connection in *The Environmentalism of the Poor*. The truth is, the brunt of the climate crisis isn't borne equally. The wealthy, who've profited most from the very systems causing ecological devastation, often escape the worst consequences. Meanwhile, the most vulnerable – indigenous communities, subsistence farmers in the Global South – face the very real threat of displacement, food insecurity, and rising sea levels.

This isn't simply a matter of geography. It's about power. Inequality creates a system where the wealthy have a stranglehold on resources and decision-making. They exploit environments with impunity, leaving the poorest to grapple with the fallout. Think of it like a house built on a crumbling foundation. The cracks might first appear in the most neglected rooms, but eventually, the whole structure weakens. Environmental degradation and social injustice are not separate issues; they're two sides of the same coin. When those most affected by environmental destruction fight back, they're not just fighting for clean water or fertile land. They're fighting for a more just and equitable world. The Chipko movement in India, where villagers hugged trees to prevent deforestation, is a powerful example.

These are the voices we need to amplify. Reducing inequality doesn't just mean evening the economic playing field. It means recognizing the inherent value of those who've been marginalized – the knowledge systems of indigenous communities, the sustainable practices of small-scale farmers. We need a fundamental shift in perspective, a move away from the exploitative, extractive model of development that has gotten us here.

So, yes, reducing inequality is absolutely key. It's about building a more resilient world, one where everyone has a stake in its well-being. It's about recognizing the interconnectedness of all things, and understanding that a future ravaged by climate change will leave no one unscathed. The fight for climate justice is, at its core, a fight for a more equitable world.

[redacted]

Pauline Briand is a journalist and author specializing in environmental issues.

Birth Chart of the Anthropocene

Bureau d'études, 2024

Cosmos

Deep space
Deep time
Primordial world

Earth

Biophysical contradictions and inefficiencies

Climate change

Soil is alive. Soil is considered a natural formation, akin to a biological environment and the result of its own dynamics.

Oceans
Atmosphere
lands

Animals
Livelihoods
Plants
Knowledge and technics

Animal breeds are numerous. Farms are small. Herds are generally small. The animals work.

Animal knowledge
Plant knowledge
Black knowledge
Indigenous knowledge
Peasant knowledge
Women's knowledge
Spirit knowledge
Cosmic knowledge

Rats
Blats

Interspecies solidarity
Subsistance struggle
Reproductive Freedom
Communalism
Comrades' love
Comrade objects
People as infrastructure

Ecuador
Antilles
Brazil

1921
Peasants' Revolts
Landless Rural Workers' Movement

Peasants, indigenous people, Blacks, women

1848

Indigenous peoples in settler states
Polynesian Panthers
One billion mountain people
Concealed communities
Persistently ignored minorities
State-repelling societies
475 million farms under 2 ha worldwide

Communities
Fourth world
Third world

Chiapas
Hmong
Siletz people

Indigenous peoples revolts
1533 1550 1712 1740 1963 2013
Women's revolts

1922
1962
1945 1960
1947
1822 1956
1811
Decolonization struggle
1964
Anti-colonial struggle
Slave revolts
1887
1685
Racial-sexual difference
1984

China
Sub-Saharan Africa
Europa
Enslavement
shatter zone
Rural exodus
Urbanization
Dust Bowl
Spatial confinement

Loss of biodiversity
Vaccination, antibiotics
Sugar colonialism
Mining colonialism
Dam construction, pipelines
Transportation, logistics colonialism
Toxic waste
Nuclear colonialism
Petroleum colonialism

Papua New Guinea
Mongolia
Yonggom people

Transpacific supply chains
Eurasian Trans-Continental Land Transport Corridors
Roads
Railways
Ports

Church Rock, New Mexico, July 16, 1979
Navajo, New Mexico
Aboriginal communities, Arnhem Land Area
Plowshare movement
Pohnpei Charter
1978
United States
Australia
Niger
Gabon
1979
1986
2010
1989

Space mining

Corporate-led, external-input plantation agriculture

Climate exile

Livestock

Chicken
Poultry
Fishes
Cows
Pigs

Animals are tradable goods. Some breeds are chosen over others. Agricultural engineers select the most efficient bulls. Particular attention is paid to the quantity of meat in the carcass. In dairy systems, the focus is on the quantity of milk produced.

Zoonoses are on the increase: avian flu, swine flu, HIV, Ebola, Q fever, Covid 19 ... These diseases are spread from animals to humans, in particular through agriculture, which plays an important role in their transmission.

Plantation

Cotton
GM soybeans
Meadows
Olive oil
Cacao
Sugar
Coffee
Tobacco
Banana
Papaver somniferum

Mechanization

Tractors
Steel plows

Chemicals

Chlordecone
Endosulfan
Fertilizers
Cancer

Land grabbing

Land is tradable capital. Plots must be large to facilitate the use of agricultural machinery. Soil is a "production factor", a neutral medium through which mineral elements, including chemical fertilizers, transit.

Work

Forced marriage
Housewives
Wage labor
Chattel slavery
Unemployment
Forced labour

Raw materials

Rocks
Mercury
Water
Rare earth
Steel

Energy

Coal
Petroleum
Uranium

Imperialism
Tax resistance
Annexation of Space
Annexation of humanhood
Annexation of the past
non-capitalist temporalities
long temporal horizons
Short-term temporality
Neoliberalism
Economic liberalism

State

Regulation and public policy
Taxes and duties

Knowledge and technics

Simplification
Standardization
Homogenization

Natural phenomena are standardized by science, technology and regulations. Technical progress is seen as the condition for human progress: status and "dignity" of the farmer, income and integration into society.
The importance of nature's complexity is reduced by biological simplification, standardization and homogenization. Biological processes are controlled by inputs.

Paleontology
Archeology
Geology
1807

Capital

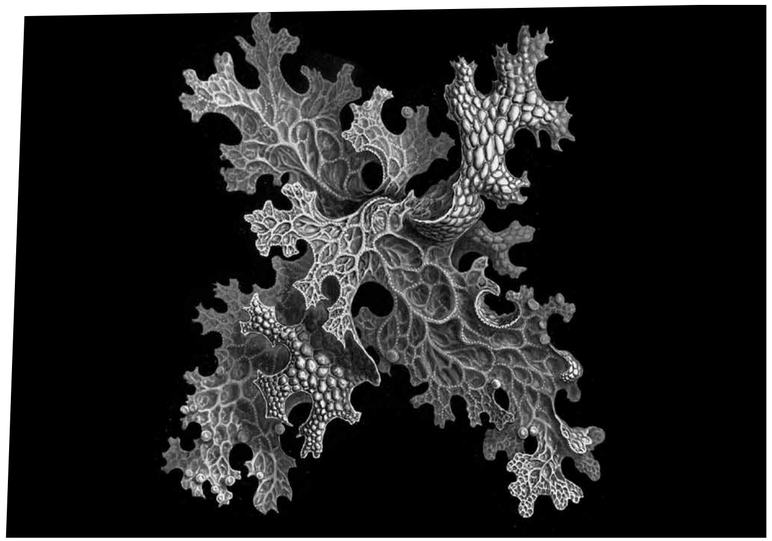
Transnational corporate elites
Market-based system
Property
economies of scale

Transformation of living beings
(1) into goods,
(2) into exploitable resources,
(3) into capital,
(4) into measurable entities,
(5) into scenery

Globe

The Politics of Symbiosis

EWEN CHARDRONNET



Kunstformen der Natur (1904), plate 83: Lichenes - Ernst Haeckel

Under Carl von Linné and up until the 19th century, certain so-called lower animal species were still placed in a special category called “zoophytes” (etymologically, animal-plants). In his 1802 classification, Gottfried Treviranus distinguished two classes: the *Zoophyta* class, including corals, jellyfish, sea anemones, hydras, sea urchins and starfish; and the *Phytozoa* class for “plant-animals”, including fungi, lichens, moss, ferns and water plants, filamentous algae and fucus, and so on. Things gradually evolved in the 19th century. Christian Ehrenberg coined the word bacterium in 1838[1], examined euglena, diatoms, radiolarians and identified corals. Henri Lacaze-Duthiers studied corals in Algeria and published a “natural history” of them in 1864[2]. In 1865, Addison Verrill created the phylum of cnidarians (corals, anemones, jellyfish, etc). In 1866, Ernst Haeckel proposed the kingdom of protists to categorize unclassifiable species with both animal and plant characteristics.

The description of these species already hinted at animal-plant symbiotic relationships, but it was the study of the dual fungus-algae nature of lichen[3] that really opened up new perspectives and established the vocabulary[4]. Several biologists went on to describe lichen: Heinrich Anton de Bary from the University of Halle in Germany, the Swiss Simon Schwendener[5], and the Russians Andrei Famintsyn and Ósip Baranetsky, who in 1867 succeeded in cultivating algae outside the thallus, or body, of the lichen[6]. But the relationship was initially understood in terms of parasitism, notably for Schwendener, for whom the fungus was a parasite of the algae and the lichen association “a community between a master fungus and a colony of slave algae that the fungus holds in perpetual captivity, in order to provide it with food”[7]. The notion was challenged, however, by De Bary, Famintsyn and Baranetsky, as well as by the Belgian zoologist Pierre-Joseph van Beneden, who in 1875 referred to other interspecific relationships as “commensalism” and “mutualism”: “The commensal does not live at the expense of its host in the sense that this dependence would create an unfavorable situation for the host, a diminution of its life, but it depends on it all the same to keep itself alive.”[8] The commensal “is received at his neighbor’s table”[9].

In 1877, Karl Möbius published in Berlin *Die Austern und die Austernwirtschaft* (the oyster and its industry), in which he introduced the term “biocenosis” in order to “account for all species living in the same environment”[10]. That same year, Albert-Bernhardt Frank, another lichen specialist from the University of Leipzig, proposed the word “symbiotismus” to move away from analysis centered on parasitism, which carried an anthropocentric bias: “Wherever there is a common internal or external habitat between two separate species, we need a broader term; whatever role the two partners play, we still don’t take it into account. In any case, we will base our observation on them simply ‘living together’, and this is why we can recommend designating these cases under the term *symbiotismus*.”[11] Finally in 1878, following Franck and in a now-famous presentation, De Bary proposed the general word “symbiosis” to describe different organisms living together[12]. As epistemologist Olivier Perru points out, “in defining symbiosis, the aim is neither to privilege mutualism nor to emphasize antagonism. Furthermore, unity aims for a common economy, which does not necessarily mean mutual benefit”[13].

Consociation

It’s interesting to note that the use of the term symbiotic in the organization of social relations predates its use in the field of biology. Indeed, as Frédéric Lordon remarked in 2015 in his *Imperium, Structures et affects des corps politiques*[14], “symbiotic” appears as early as the 17th century in the work of jurist and political philosopher Johannes Althusius. As Lordon points out, Althusius is often mentioned as a precursor of confederalism or libertarian anarchism. In his *Politica methodice digesta et exemplis sacris et profanis illustrata*, published in 1603, this Calvinist trained in civil and ecclesiastical law in Basel considers that “before being subjects of any sovereign, individuals are ‘symbiotes’”. Lordon stresses that “it is the immanence of their common life that must be the starting point of all political thought,” referring us to works written a decade ago by Gaëlle Demelemestre, which helped disseminate Althusius’s thoughts in France[15]. In the first paragraph of his *Politica*, Althusius writes: “Politics is the art of establishing, cultivating and preserving among men the social life that must unite them. This is called symbiotics. The subject of politics is thus consociation[16], by intentional or tacit pact, by which symbionts reciprocally bind each other to the mutual communication of things that are useful and necessary for participating in social life. The objective of the symbiotic policy developed by mankind is sacred, just, appropriate and happy symbiosis, ensuring that nothing necessary or useful to life is missing.”[17]

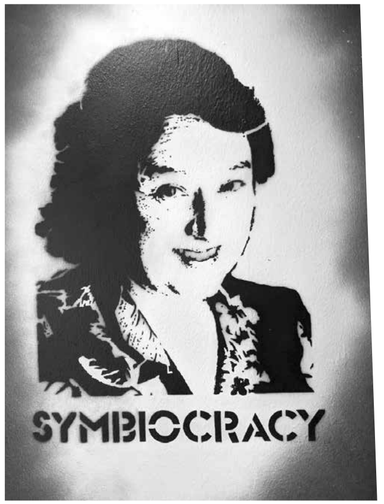
Note that Althusius’s *Politica methodice digesta* was published 40 years before British philosopher Thomas Hobbes’s *De Cive* (On the Citizen), which introduces the notion of *bellum omnium contra omnes* (war of all against all), based on the age-old motto of homo homini lupus, man is a wolf to man[18]. So it seems that it was Hobbes’s image of man as inherently violent in his natural state, an individualist with an insatiable desire for power, that endured right up to the 19th century. This image informed the poet Lord Tennyson’s “nature red in tooth and claw”[19], as well as Herbert Spencer’s[20] and Charles Darwin’s “survival of the fittest”. Hobbes repeatedly proclaimed that he was the first to establish - with Leviathan in particular - an authentic and scientifically founded doctrine of human affairs, the first to make a science of morality and politics. We prefer Althusius, who before Hobbes described the human being as a “civil animal ardently aspiring to association”. For Althusius, symbiosis (living together) implies more than mere common existence; it “indicates a quality of mutual sharing and communication”[21] without which society is not possible.

From symbiosis to mutual aid

The expression “survival of the fittest” was first introduced by Herbert Spencer in his *Principles of Biology* published in 1864, five years after Darwin’s *Origin of Species*. A rare best-selling author of his time, Spencer significantly contributed to developing a social Darwinism that paved the way for scientific racism. This reading of Darwinism had already been roundly mocked by Karl Marx and Friedrich Engels. But in the late 1870s, when symbiosis theories were emerging, anarchist authors were keen to nurture a perspective of mutual aid between living beings to counter the conservative appropriation of Darwin’s theses. Such was the case of Elisée Reclus in Geneva, with his article “Evolution and Revolution” in Piotr Kropotkin’s journal *Le Révolté* in 1880, and of Emile Gautier with his pamphlet *Social Darwinism*[22], published in Paris the same year. For Gautier, the permanent “struggle for life” implied by the “law of natural selection” becomes less intense as social institutions develop. Mutual assistance and social solidarity are the motors of human progress, and constitute the true content of “social Darwinism”, much more than the struggle and victory of the “fittest”. In 1883, Gautier was sentenced to five years of prison alongside Kropotkin and others in the famous trial of the 66 anarchists in Lyon.

After being released from prison in 1886, Kropotkin went to Edinburgh to meet the biologist and urban planner Patrick Geddes – a close associate of Reclus and specialized in marine animal-algae symbioses, Roscoff worms, anemones and sea hydras, which he had studied under Lacaze-Duthiers. Geddes believed that natural selection was not the primary force of evolution, the result of survival of the fittest, but rather a brake on evolutionary tendencies, the pruning tool that enabled a better development of the plant or organism; he considered cooperation to be more important for the evolution of all life forms and saw the Earth as a cooperative planet[23]. Geddes inspired Kropotkin to write “Mutual aid among animals”, the first in a series of articles originally published between 1890 and 1896 in the British periodical *The Nineteenth Century*, exploring the role of cooperation and mutual aid in the animal kingdom and in human societies past and present[24]. In it, Kropotkin shows - in Darwin’s own playing field - that mutual aid has pragmatic advantages for the survival of human and animal communities, and that it has been favored by natural selection in the same way as consciousness.

In Russia, Famintsyn worked tirelessly to describe the acquisition of symbionts by the host and to demonstrate the new (advantageous) characteristics that this acquisition conferred on the host from an evolutionary point of view. In probing the various connections between symbiotic theory and Darwinist theory, his first objective was to identify the real causes of change from one species to another, in interaction with the environment. Indeed, while Darwin was the first to base evolution on the postulate of the struggle for life, he was also the first to give a scientific account of the development of harmony between living beings and the natural environment. For Famintsyn, due to both the efficient nature of natural selection (of the fittest individuals) and the variation of the fittest (in the case of symbiosis), it is not possible to consider evolution in terms of finalism. Famintsyn locates the unification of living things in the interaction and complementarity of elementary forms. His re-reading of Darwin led him to emphasize the driving role of mutualistic and symbiotic interactions as sources of innovations that selection will retain throughout the course of evolution[25].



Stencil of Lynn Margulis. With her endosymiotic theory of evolution, Margulis opposed competition-oriented views of evolution, stressing the importance of symbiotic or cooperative relationships between species.

(1) Christian Gottfried Ehrenberg, *Die Infusionsthierchen als vollkommene Organismen*, Verlag L. Loss, Leipzig, 1838, p. 75.

(2) Henri Lacaze-Duthiers, *Histoire naturelle du corail*, Baillère et fils, Académie impériale de médecine, 1864.

(3) Heinrich Anton de Bary, *Morphologie und Physiologie der Pilze, Flechten und Myxomyceten* (Morphology and physiology of fungi, lichens and myxomycetes), Verlag W. Engelmann, Leipzig, 1866.

(4) Olivier Perru, "Aux origines des recherches sur la symbiose vers 1868-1883", *Revue d'histoire des sciences*, 2006/1 (Tome 59), p. 5-27. Olivier Perru is the author of *De la société à la symbiose. Une histoire des découvertes sur les associations chez les êtres vivants* published by the Interdisciplinary Institute of Epistemological Studies (2003 and 2007).

(5) Simon Schwendener, Untersuchungen über den Flechtenthallus, *Beiträge zur wissenschaftliche Botanik*, VI (1868), 195-207 & IDie Algentypen der Flechten Gonidien, Programm für die Rektorsfeier der Universität Basel, IV (1869), 1-42. ; Perru, op. cit. in n.4.

(6) Dans Liya Nikholaïevna Khakhina, Concepts of symbiogenesis (Yale : Yale Univ. Press, 1992) ; Perru, op. cit. in n.4.

(7) Margalith Galun, Lichen research : An overview with somemphases, in *Endocytobiology* IV (Paris :inra,1990), 161-168 ; Perru, op. cit. in n.4.

(8) Perru, op. cit. in n.4.

(9) Pierre-Joseph Van Beneden, *Les Commensaux et les parasites dans le règne animal*, 2nde éd. (Paris : Baillière, 1878 ; Ire éd., 1875) ; Perru, op. cit. in n.4.

(10) Jean-Marc Drouin, *L'Écologie et son histoire* (Paris: Flammarion, 1991), 87 ; Perru, op. cit. in n.4.

(11) Albert-Bernhardt Frank, "Über die biologischen Verhältnisse des Thallus einiger Krustenflechten" (On the biological conditions of the thallus of some crustaceous lichens), *Beiträge zur Biologie der Pflanzen*, II (1877), 123-200. Frank is also credited with the term *mycorhiza* in 1885.

(12) "Die Erscheinung der Symbiose", published in French as "De la symbiose", *Revue internationale des sciences*, Paris, O. Doin, (1878-1879) , pp. 301-309.

(13) Perru, op. cit. in n.4.

(14) Frédéric Lordon, *Imperium, Structures et affects des corps politiques*, La Fabrique, 2015.

(15) See Gaëlle Demelemestre, *Les Deux Souverainetés et leur destin. Le tournant Bodin-Althusius*, Éditions du Cerf, 2011; and *Introduction à la "Politica methodice digesta" de Johannes Althusius*, Éditions du Cerf, 2012. Cité par Lordon, n.15.

(16) Consociationalism or democracy of concordance of governance is studied since the 1960s in countries such as Switzerland, Belgium and Lebanon.

(17) Gaëlle Demelemestre, op. cit., p. 51, *Politica* 1, paragraph 1.

(18) Its first known occurrence is in *La Comédie des ânes* by Plautus in 3 B.C.

(19) The expression comes from the “Dinosaur cantos” or “dinosaur sections” of Alfred Lord Tennyson’s *In Memoriam A. H. H.* (1850).

(20) Herbert Spencer, *Principles of Biology*, 1864, vol. 1, p. 444 .

(21) Althusius, *Politica*, 1.3, 1.6 and Althusius, *Politica*, 3.33. Cited by Nico Vorster, “Symbiotic Anthropology and Politics in a Postmodern Age: Rethinking the Political Philosophy of Johannes Althusius (1557–1638)”, North-West University, South Africa, *Renaissance and Reformation* 38.2, spring 2015, p.27.

(22) Emile Gautier, *Le Darwinisme social*, Derveaux, Paris, 1880.

(23) Helen Meller, Patrick Geddes, *Social Evolutionist and City Planner*, Routledge, 1990, p.27.

(24) Piotr Kropotkine, *Mutual Aid: A Factor of Evolution*, London, 1902.

(25) Perru, op. cit. in n.4., p.24 In general, this text owes a lot to Olivier Perru’s work.

Feral Living through Poetic Immersion in the Satoyama

LEILA CHAKROUN

It's 6:30 a.m. A Japanese voice crackles out of the loudspeakers, intermingling with the morning songs of cicadas and bush warblers, and with the metal clang of pots and pans in the kitchen. Sunlight warms the walls of the house, which had remained cool all night, thanks to an informed choice of materials: raw earth, bales of straw and charred wood. A dense forest of Japanese cypress (*hinoki*) invaded by bamboo surrounds the dwellings, leaving part of the rooms in shade.

The smell of curry announces the start of breakfast. The small community, a sort of chosen family, sits down and chants a little prayer addressed to the Earth and earthly creatures, human and non-human, who together have made possible this savory blend of flavors and textures, being present here this morning, allowing our bodies to remain in motion. Almost everything is produced on site: vegetables, rice and spices (coriander, ginger, turmeric). Rapeseed oil and cheese were exchanged with a neighboring farm, located further down the valley, not far from a former metropolis, now depopulated.

Each person speaks in turn, sketching out the plan for the day little by little. There is no fixed leader here, as we experiment with horizontal governance and fluid work management by temporary leaders. Today is the day we harvest the rice. In addition to planning the different stages, equipment and storage, we also need to organize our work to include the people from a neighboring village who will come to lend a helping hand. We experience this seasonal repetition of common gestures as a celebration of a way of life that is still possible, despite everything. Despite the demographic decline, where some houses no longer light up after nightfall. Despite the exhaustion from working on steep terrain and during increasingly frequent heatwaves, even in early autumn. Despite the large population of monkeys, wild boars and deer, with whom farmers must share the harvest, whether they like it or not. Despite the soil, which, even after being cultivated for decades using natural farming practices, still retains traces of toxic clouds and excessive chemical fertilizers. But each morning, the rural soundscape reminds us that it's possible to resist and survive the cacophonic frenzy of the big cities. If rurality persists, it will surely be through perpetuated and reinvented "musical scores" of gestures[1].

Musical scores of common gestures and multispecies landscapes

These multi-sensory and multi-species scores are at the heart of the Japanese philosophy of satoyama. The now-ecological term "satoyama" originally designated mixed landscapes, composed of small mountain village communities and the adjacent forest that they cultivated for subsistence. The Japanese concept 里山 is composed of the kanji 山 *yama* (mountain), and 里 *sato* (village). The play on words dates back to the 18th century Edo period, when the kanji for 山里 *yamazato* (mountain village) were inverted.

Satoyama literally designates the mountain of the village, or perhaps more poetically, "the village mountain" – thus reversing the proprietary logic by subsuming the human settlement to the ecosystem that hosts it. It's a forested mountain that lives through and with "its" humans. In a progressive semantic shift, satoyama now designates forested farmlands on the outskirts of villages in the mountains or countryside. The concept wasn't a part of common Japanese vocabulary until the early 1960s, when it was proposed by Shidei Tsunahide, a forestry ecologist who wanted to give a name to these landscapes that he saw "silently" disappearing.

Satoyama landscapes have been deeply affected by the social, territorial and economic dynamics that followed Japan's modernization – beginning with the Meiji restoration in 1861, then even more dramatically after World War II. The nation became largely urban, structured around metropolises, to the point that today, 92% of Japan's population of 126 million lives in cities (2024). With fewer people living in rural areas, there are also fewer farmers – only 2% of the working population is involved in agricultural production. This net loss of the workforce and of the community ties that once maintained satoyama is exacerbated by the lack of renewal and subsequent aging population of rural regions.

The disintegration of satoyama highlights a particular understanding of agrarian and agroforestry landscapes, which diverges from the patrimonial and backward-looking vision that has underlain discourses on environmental protection. It is indeed the collapse of community dynamics and the absence of human residents that has accelerated the demise of these landscapes and many of the non-human creatures that populated them. Satoyama have become the symbol of a possible coexistence between humans and non-humans, in Japan and internationally[2], the living proof of a terrestrial future that does not exclude humanity, but rather carries it through an ethos and praxis of care. Several studies have identified the biocenosis that constitutes the satoyama, i.e., the multi-species agroforestry community, which includes 350 species of trees and plants living in forests, rivers and fields, fungi such as the (too) much-loved matsutake, fish, frogs, ducks and herons, as well as small rodents and their predators (hawks, sparrowhawks)[3].

Today, satoyama stand to benefit not only from their traditional countryside esthetics – dense forest, village hamlet, terraced rice paddies – but as physical and territorialized manifestations of what some have called the "bioregional hypothesis"[4]. Etymologically, the bioregion refers to a "territory of life" – not only the place that we occupy during our lives, but a place that hosts various forms of life and interactions among them.

These manifestations are buried in the interstices of territories, whose liminality allows room for experimentation and divergence. Satoyama can be seen as these interstices in a number of ways: they are located on the edges, far from major urban centers, intermingle the essences of plant and animal, forest and farm, thus blurring the boundaries between wild, cultivated and inhabited spaces. The abandonment of these landscapes and the lack of human intervention have only reinforced the fluidity of these boundaries. Currently in the process of being de-domesticated and re-wilded, satoyama have become living examples of feral life, which we must urgently learn to inhabit[5]. They teach us that, in the face of extractivism and desertification, becoming feral is the best thing that can happen to us, if not the only possible condition for our humanity. It is precisely because these socio-agro-ecosystemic dynamics are partially "liberated" from industrial farming practices and culturally dominant esthetic standards, that they support budding precious liminal spaces to imagine, collectively and corporeally, novel lifestyles and renewed connections with ourselves and with others, human and non-human.

Becoming feral opens, even forces, new possibilities. As daily gestures are performed in a multi-species community[6], new landscapes emerge, and with them existential and political nourishment to subsist and resist within the entanglements and sympoieses of the Chthulucene[7]. In the shadows of these depopulated countrysides, we can see the light of other cosmologies.

Toward a neopeasant, agroecological, bioregional and multispecies future

In Japan, satoyama have spearheaded a form of sustainability that embraces human existence, along with the landscapes that accompany it and give it meaning. Considering the plethora of actors, permaculture and natural agriculture movements are among the few to venture beyond the discourse of coexistence to truly experiment with possible ways of inhabiting these landscapes – by allowing themselves to transform them, and perhaps taint some of their romanticized clichés.

In addition to re-inhabiting the spaces, these actors rehabilitate them through public events. In 2019, Permaculture Center Pamimomi and Satoken Association organized a public meeting under the slogan "Satoyama Repair" to discuss potential methods for repairing and caring for satoyama using permaculture design and natural farming techniques. Among the proposed social and ecological innovations was a workshop given by Pamimomi on their rice fields. The paddies are entirely cultivated – or precisely "not cultivated" (耕さない田んぼ *tagayasanai tanbo*) – according to Fukuoka Masanobu's principles of non-action: the soil is not turned over or limed dry, no fertilizers or chemicals are applied, the rice grains come from the previous year's harvests, transplanting is done by hand, submersion of the rice fields is limited in time to encourage tillering, harvesting is done collectively and with a sickle, bunches are tied with straw and dried on structures made of local bamboo, then the grains are separated from the ears of rice using a pedal threshing machine (千把扱き *senbokoki*), activated by continuous foot movement. Through these gestures, which resonate with both tradition and new ecological demands, it becomes possible to "repair" the satoyama. This is less about returning it to a previous state than a novel experiment in neo-peasant, multi-species and agro-ecological subsistence.

If only the nurturing, landscape-based philosophy of the satoyama could infuse our imaginations and narratives, it could set in motion the impetus for a neo-peasant future. Instead of patrimonializing and replicating traditional Japanese agrarian landscapes, we could irrigate contemporary agro-ecological gestures and landscapes with the past, infra-, intra-, inter- and trans-species convivialities that have enabled earthly creatures, including humans, to subsist until now.

Satoyama teach us what it can mean to "coexist" in the context of imminent collapses and limited resources, while at the same time urging humility and creativity, stratagems and poetry. A haiku written by a woman from the Pamimomi collective sets the tone:

パミモミは (*pamimomi wa*)
世界を変える (*sekai o kaeru*)
秘密其地 (*himitsu kichi*)

Pamimomi is
a secret hideaway
that changes the world

Leila Chakroun holds a PhD in environmental sciences (environmental humanities) on the permaculture movement in Switzerland and Japan.

(1) The idea of using a musical "score" to qualify a succession of gardening gestures is borrowed from Joanne Clavel and Lucile Wittersheim (2023), *Gestes sonores: enquête au cœur de la récolte maraîchère*, Galaad Edizioni, pp.121-134.

(2) As demonstrated by the *International Partnership for Satoyama Initiative* in 2010, which aimed to increase the value of "socio-ecological production landscapes".

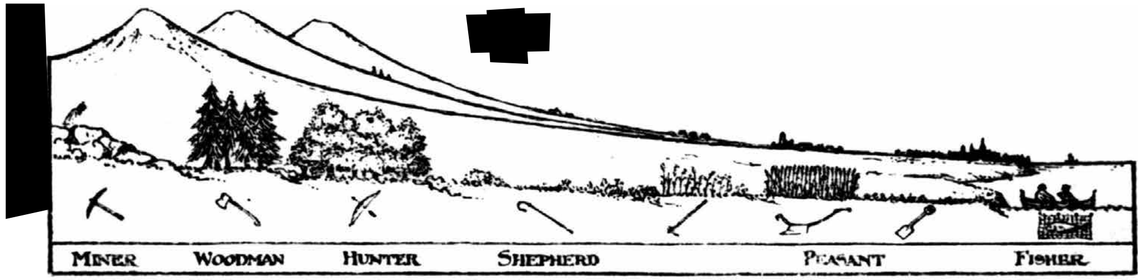
(3) Kuramoto N, Sonoda Y. 2003. "*Biological diversity in satoyama landscapes*". In: Takeuchi K, Brown RD, Washitani I, Tsunekawa A, Yokohari M, editors. *Satoyama: the traditional rural landscape of Japan*. Tokyo: Springer-Verlag ; p. 81–109

(4) Mathias Rollot, (2018), *Les territoires du vivant: un manifeste biorégionaliste*.

(5) Anna L. Tsing, Jennifer Deger, Alder Keleman Saxena and Feifei Zhou, (2021), *Feral Atlas, The More-Than-Human Anthropocene*, Stanford University.

(6) Centemeri, L. (2018). *Commons and the new environmentalism of everyday life. Alternative value practices and multispecies commoning in the permaculture movement*. Rassegna italiana di Sociologia, 64(2), 289-313.

(7) Donna Haraway, (2016), *Le Manifeste Chthulucène de Santa Cruz*, La Planète Laboratoire N°5, 2015.



Valley Section, 1909 version

“It takes the whole region to make the city”

EWEN CHARDRONNET

As battles for water converge (the Soulèvements de la Terre ecological resistance network[1], indigenous uprisings against the appropriation of water for lithium extraction in the region of South American salars[2]), as rivers obtain the status of “legal person” (Whanganui River in New Zealand and Rio Atrato in Colombia in 2017, Magpie in Quebec in 2021), and as official bodies associated with watersheds have since been established (Loire Parliament[3], Diplomatic Watershed Council in Geneva[4]), calls to create new spaces for bioregional knowledge are increasing. In this respect, biologist and urbanist Patrick Geddes has attracted new interest as a precursor in educating about the relationships between regions, ecosystems and human societies. He tackles it from a historical perspective that differs from the more recent American school of bioregionalism, which is often criticized for its essentialist misanthropy[5].

Geddes is also cited in the *Dictionnaire de la pensée écologique* by Dominique Bourg and Alain Papaux, who describe him as one of the pioneers of regional planning and, along with Elisée Reclus and Piotr Kroptokine, someone who has consistently promoted reintroducing the countryside in the heart of cities (through outdoor and indoor gardens)[6]. Geddes’s most famous contribution to the city-countryside conflict is the simple diagram of the *Valley Section*, presented for the first time in 1905 at a meeting of the London Sociological Society[7]. The diagram unites city and countryside through the idea of a “regional valley”. The *Valley Section* is a longitudinal section that follows a river from its source in the mountains to where it flows into the sea. For Bourg & Paillot, it’s “an intellectual tool for regional studies, which should take into account the concept of river basins, from the viewpoint of the relationship between environmental and human history, as well as the relationship between the city and its surrounding region”[8]. In his first study, Geddes writes: “By descending from source to sea we follow the development of civilisation from its simple origins to its complex resultants; nor can any element of this be omitted. (...) In short, then, it takes the whole region to make the city. As the river carries down contributions from its whole course, so each complex community, as we descend, is modified by its predecessors. The converse is no doubt true also, but commonly in less degree.”[9] The version of the *Valley Section* published in 1909 combines physical conditions, represented in the drawing by plants, with so-called natural or basic occupations, represented by tools, and social organizations represented by the silhouettes of cities, villages and individual houses. Moreover, in reality the “regional valley” includes several valleys and an agricultural plain that extends from the base of the mountains to the coast. The *Valley Section* shows how the physical conditions of the environment influence plant life and determine human occupations and their societal organization. It helps us understand “how far nature can be shown to have determined man” and “how far the given type of man has reacted, or may yet react, upon his environment.”[10].

Thinking Machines

Geddes’s diagram was part of his series of “thinking machines”, a visual method of presenting and correlating facts and ideas in order to facilitate reflection and teaching. In conceiving and deploying the *Valley Section*, he took inspiration from great researchers in biogeography, such as Alexander von Humboldt and Aimé Bonpland. But he was also inspired, perhaps more specifically, by the methodology he learned from Thomas Huxley - under whom he studied biology in the late 1870s - and by the phytogeography research on the relationships between plant species done by his friend Charles Flahault - whom he met during his studies and a residency at the Biological Station in Roscoff, France. Nicknamed Darwin’s bulldog, Huxley had little appreciation for Darwinism applied to human societies, as promoted by Herbert Spencer, who used it to justify the social exploitation and oppression of marginalized classes. He emphasized the importance of science to elucidate social issues, but he opposed using biology to justify inequitable social policies. He therefore taught lucidity to counter excessive simplifications in describing the relationships between organisms and their environment, between biology and physiography, and in revealing the complex factors leading to natural evolution. Two of his most famous manuals, *Elementary Instruction in Practical Biology* (1875) and *Physiography: an Introduction to the Study of Nature* (1877) were published during the time that Geddes was his student. In *Physiography*, he introduces the book by studying a particular region, the Thames watershed. And in the republications near the end of his life, he expanded the theme of watershed beyond the Thames to any river.

Since the years when Geddes and Flahault studied in Roscoff, Flahault had founded the Botanical Institute in Montpellier[11] and was studying phytosociology, or plant associations that were cooperative and mutually beneficial, in a way the premises for permaculture[12]. By crossing phytogeography and Flahault’s phytosociology using Huxley’s strict methodology, Geddes’s *Valley Section* also falls in line with the hydrographic basin model as developed by Elisée Reclus in his *History of a Stream*[13]. Reclus systematically used the hydrographic basin as a criterion for regional division, most notably in his *Nouvelle Géographie Universelle*. He was one of the first to recognize the intrinsic link between the geographical characteristics of a region and the lifestyles of its inhabitants.

Summer Meetings of Art and Science

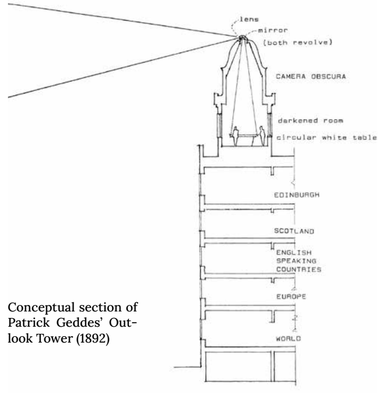
Geddes had read extensively and developed a friendship with Elisée Reclus, 25 years his senior. He had hosted him twice in Edinburgh during the Summer Meetings of Art and Science, which he organized with his wife Anna from 1883 to 1899. This summer school, inspired by the Arts & Crafts movement and John Ruskin, combined educational programs in natural sciences, botanical or vegetable gardening, observing biodiversity, arts and crafts, biology, geography, economics and politics, based on Geddes’s own “thinking machines”: “Starting from the familiar idea of working from the concrete to the abstract, from the senses toward the intellect, it is attempted in each subject of study (1) to freshen the student’s mind by a wealth of impressions; (2) to introduce him to the advancing literature of the subject; (3) to supply him with the means of summarizing, arranging and more clearly thinking out these accumulations of observation and reading. Hence (1) the insistence on demonstrations, experiment and field excursions; (2) the introduction in several subjects of the seminar, which, with its guidance to the world of books and activity in using them, is so marked a strength of the German university; (3) the extended use of graphic methods.”[14] Geddes sought to mobilize “hand, heart and head”. He was also behind the slogans “learning by doing” and “think global, act local”. Many students, artists, as well as famous theorists and researchers from various countries participated in the Summer Meetings, from the biologist Ernst Haeckel to Piotr Kropotkine.

Reclus came to the Summer Meetings in 1893 and in 1895. It was in this context that he published “The Evolution of Cities” in *The Contemporary Review*[15]. The article advocated reconciling constantly expanding cities, which were “engulfing year by year fresh colonies of immigrants, and running out their suckers, like giant octopuses, into the surrounding country”, with the countrymen, which could come to cities to amuse and educate themselves. He concludes: “Thus this type of the ancient town, sharply outlined by walls and fosses, tends more and more to disappear. While the countryman becomes more and more a citizen in thought and mode of life, the citizen turns his face to the country and aspires to be a countryman. By virtue of its very growth, the modern town loses its isolated existence and tends to merge itself with other towns, and to recover the original relation that united the rising market-place with the country from which it sprang. Man must have the double advantage of access to the delights of the town, with its solidarity of thought and interest, its opportunities of study and the pursuit of art, and, with this, the liberty that lives in the liberty of nature and finds scope in the range of her ample horizon.”

For Geddes, every “town arises and renews itself from country; and this not only in blood and in temperament but in tendencies, aptitudes, activities, in qualities and defects; in short in character, individual and social.”[16] Thus, he defines the idea that both conurbation and the constantly expanding city emerge from the countryside and return to it as the highest expression of the country’s inherent possibilities. He gives a lot of importance to artisanal occupations, inspired in particular by the notion of mutual aid advanced by Kropotkine, who saw medieval Europe as the best example of human cooperative society, culminating in the medieval city structured around occupational guilds. Geddes had hosted Kropotkine in Edinburgh in 1886, just after he was released from three years of prison in Lyon. In *Fields, Factories and Workshops* published in London in 1898, Kropotkine imagined the future city-countryside relationship made up of decentralized units - either in “the factory in the middle of the fields” or in industrial villages. He projected that new, small power plants could make his decentralized, self-determined mode of production possible, even in existing large industrial cities.

Bioregional Learning Centers

In conclusion, we are reminded that in order to study the “city region”, it was necessary for Geddes to begin with an associated Regional Survey; hence, establishing stable and permanent learning centers was essential. Such was his intention in founding his Outlook Tower museum-school in Edinburgh, as well as his Collège des Ecossais in Montpellier: “Hence Education, if real, begins with a Regional Survey, as action with a regional usefulness. Hence such a regional type-museum and school of reference has to be not only geographic, but geotechnical. In the very difficulties of coping with the vast and perplexing division of labour, alike in science and in practical life, it finds its necessity and its justification as at least an attempted clearing-house of education, in which all specialists may again meet.”[17] These same ideas can be found in the principle of Bioregional Learning Centers proposed in 1982 by Donella Meadows, principal author of *The Limits to Growth* for the Club de Rome in 1972, which were later developed: “Out of that combination came a vision of a number of centers where information and models about resources and the environment are housed. There would need to be many of these centers, all over the world, each one responsible for a discrete bioregion. They would contain people with excellent minds and tools, but they would not be walled off, as scientific centers so often are, either from the lives of ordinary people or from the realities of political processes. The people in these centers would be at home with farmers, miners, planners, and heads of state and they would be able both to listen to and talk to all of them. The job of these centers is basically to enhance that capacity... to solve problems in ways that are consistent with the culture and the environment. The centers collect, make sense of, and disseminate information about the resources of their bioregions, and about the welfare of the people and of the ecosystems. They are partly data repositories, partly publishing and broadcasting and teaching centers, partly experiment stations and extension agents. They know about the latest technologies, and the traditional ones, and about which ones work best under what conditions. They are able, insofar as the state of knowledge permits, to see things whole, to look at long-term consequences, and to tell the truth. They are also able to perceive and admit freely where the boundaries of the state of knowledge are and what is not known.”[18]



Conceptual section of Patrick Geddes’ Outlook Tower (1892)

(1) https://lessoulevementsdelaterre.org

(2) Alfarcito Gathering, January 14-15, 2023, in San Francisco del Alfarcito, Jujuy, Argentina: https://aerocene.org/salinas-grandes-eng

(3) https://www.parlementdeloire.org

(4) David gé Bartoli, Sophie Gosselin, Marin Schaffner and Stefan Kristensen, “Pour un Conseil Diplomatique des Bassins Versants”, on *Terrestres.org*, April 12, 2024.

(5) Antoine Dubiau, “Faire l’histoire intellectuelle du biorégionalisme”, 28 février 2022, *métropolitiques.eu*. Antoine Dubiau is the author of *Écofascismes* published by Grevis (2023).

(6) Lewis Mumford referenced and further extended the research initiated by Patrick Geddes in *La Cité à travers l’Histoire* (1961).

(7) P.Geddes (1905), “Civics: as applied sociology”, Part I, *Sociological papers*, (ed.) V.V.Branford London: Macmillan, pp. 105-6.

(8) Dominique Bourg and Alain Papaux, under “Patrick Geddes (1854-1932)” in *Dictionnaire de la pensée écologique*, PUF, 2015, pp. 462-464.

(9) Ibid. note 7.

(10) Patrick Geddes, “The Influence of Geographical Conditions on Social Development”, *Geographical Journal* 12 (1898), p. 581. Cited in Volker M. Welter, *Biopolis*, MIT Press, 2002, p.62.

(11) Geddes settled in Montpellier in 1924, where he founded the Collège des Écossais and lived the rest of his life.

(12) The notion of “permanent agriculture” appears around the same time, in 1910, in Cyril G. Hopkins’s *Soil Fertility and Permanent Agriculture*.

(13) Elisée Reclus, *Histoire d’une montagne. Histoire d’un ruisseau*, Libertalia, 2023.

(14) Cited in Helen Meller, Patrick Geddes, *Social Evolutionist and City Planner*, Routledge, 1990, p.67.

(15) Elisée Reclus, “The Evolution of Cities”, *The Contemporary Review*, v. 67, January-June 1895, Isbister and Company Ltd.

(16) Patrick Geddes, *City Surveys for Town Planning* (Edinburgh and Chelsea: Geddes and Colleagues, 1911). Cited in *Biopolis*, p. 75

(17) Ibid. note 10.`

(18) Bioregional Essays: Bioregional Centres - Donella Meadows’ Vision for Deep Local Change. Statement to the Belaton Group, 1982.

For Œgrowth

A growth that tends to produce more energy-matter[1] than it consumes

RICHARD LOIRET

A good government must be based, as Physiocracy emphasized in its time, on the recognized utility, managed as such, of the humus (an energy-matter complex) accumulated in fertile soils, the true engine of the economic machine. But, as Marx will observe, throughout the industrial revolution, the liberal classes would instead engage in the "plunder" of this humus, the secret of their primitive capital accumulation. And their unquenchable thirst continues to this day, through the ever-increasing extraction of new, ever more productive energies, drawn more widely and deeply from the Earth (fossil fuels, ...), in ever greater quantities, to power ever more machines[2]. But the corollary was inevitable: the more these energy stocks transformed into capital, the more the carbon it contains dissipates into CO2, giving us this curious and all too real "chemiconomic" equation: Carbon = Capital + CO2

Of course, we would be tempted to simply reverse the terms of the equation[3], to see the emergence of a form of economy in which we would accumulate "carbon-energy"[4] by recycling both CO2 and capital. This, as suggested by this model of non-punitive ecology, an Eco-tax "allocated" to CO2 recycling[5], which, among other virtues, financed organic agriculture. But this alternative to growth, while initiating the concept of "Carbon balance," collided head-on with the logic of the system and ignored the question of Life, which itself encounters, as we will see later, a conceptual and radical barrier.

Œgrowth aims to address this question. This term, because its prefix "œ" refers us to œconomia, the Greek economy of the ecumene (οἰκουμένη)[6], from a time when the City was not separated from the Oïkos by a radical political barrier, which transformed it into chrematistics, the monetary economy at the origin of capitalism. In French, the two short words, "œuf" and "œil" (egg and eye) stem from it, not to mention "œuvre" (work), and potentially "cœur" (heart). So this prefix also refers to the notions of organic sphere, gestation, inner growth, and the full expression of life. It is finally found in the French term “œcuménisme”, (ecumenism) which directs us toward a common action engaged by various currents of thought, despite their doctrinal differences. Furthermore, as it is pronounced "eu", this prefix is also full of promises. It comes from the Greek "eú" which means good, well, true, and is represented by the letter "ø" (phi, the golden ratio). In common language, we have eukaryote (true nucleus), euphony (related to harmony), eutrophy (good nutrition), euphoria (of the well-being), etc., although eugenics, which aims to improve human existence, may lend itself to interpretations. Thus, this term can be written indifferently as "Œgrowth" or "Eugrowth" [7].

Simply defined, and for any territory of determined perimeter where there exists a comparable relationship between the production and consumption of carbon-energy (from family property to national economy until the entire Earth), Œgrowth results from a joint Human-Nature work whose net yield (production minus consumption) under the "Ecological Balance"[8] of this territory (Ecological Assets minus Ecological Liabilities), tends to become greater than 0.

Conceived in this way, this principle was long applied, at least intuitively, in the local economy of ancient communities’ ecumene, such as the cultivated forests of the Amazon (domesticated landscapes), which an increasing number of researchers are studying (William Balée, Clark L. Erickson,...). Œgrowth would be increasingly applied today in territories adopting organic farming, permaculture, edible forests, etc.

However, Œgrowth becomes more complex when, beginning with carbon-energy and its well-established measurement, its scope of intervention expands to the question of Life, to biodiversity and the biological processes associated with it. This then becomes what is called "biogeochemical" energy, which raises the question of an entropy of life that is said to be "negative", and opposite to entropy, typically understood as positive. Here, with the "thermodynamic" version of the ecological balance[9], we encounter a notion of "fertility," of ecological regeneration, far more extensive than just the recycling of CO2. This production-consumption system, from the most local scale to the entire planet, seeks to accumulate, jointly with Nature, and through its overall metabolism, at least as much if not more negative entropy (in the form of energy-matter) than it consumes.

Nevertheless, this concept of growth faces a fundamental barrier in the history of sciences.

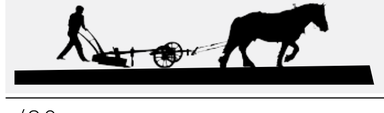
An "impossible" energy accumulation

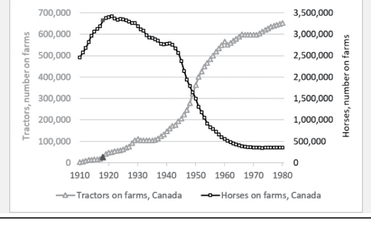
Around 1880, the Ukrainian scientist Sergeï Podolinsky's "Theory of Energy Accumulation" drew a lot of attention with its "seminal" concept of synergies from a "joint work" of Man and Nature, and his luminous demonstration of its cumulative surplus effects, based on the translation of agricultural resources into energy (see below).

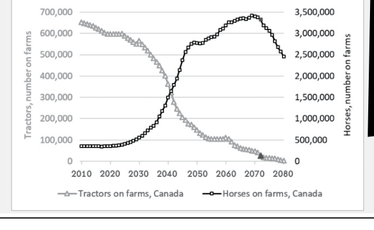
Engels and Marx greatly appreciated this theory. But more recently, it was challenged by the underlying threat of the "second principle" of thermodynamics, which Arthur Eddington universalized in his "Arrow of Time". Here, he marries Darwin's randomness with Clausius' entropy to translate the irreversibly entropic nature of evolution, adding that: “The law that entropy always increases - the second law of thermodynamics - holds, I believe, the supreme position among the laws of nature. If one discovers that any of your theories are in conflict with the second law of thermodynamics, I can offer you no hope; there is nothing for it but to collapse in deepest humiliation”. Such a powerful threat to the intelligentsia, that since then, throughout the physics of the 20th century, it has implicitly assumed that negative entropy does not exist[10]. For Marx and Engels, even if it was the implicit assertion that life and all its expressions did not exist, or at best, that they were meaningless and uninteresting in the grand scheme of the universe, and even if Marx had decrypted the secret of capital accumulation, it was feared that the increasing entropy of industrial metabolism would contradict Podolinsky's theory.

a projection into

the future of draught power







Energy accumulation and productivity of joint labor between nature, humans, and machines

Comparative evolution, between 1870 and 1970, of production and energy productivity in French agriculture	Yield Qtl/ha	kcal/ha: A - Energy production (a) Total harvest (hay or grain + straw)	kcal/ha: (b) Energy surplus compared to natural grassland	kcal/ha: (c) Energy consumption (human - animal - machine)	kcal prod. / kcal conso.: B - Energy productivity (a)/(c) Total productivity	kcal prod. / kcal conso.: B - Energy productivity (b)/(c) Surplus productivity
1870 *Source : Theory of energy accumulation, Serguei Podolinsky (1880)*						
1 - Natural grassland	25	6 375 000	0	0	∞	∞
2 - Traditional artificial grassland	31	7 905 000	1 530 000	37 450	211,08	40,85
3 - Traditional wheat cultivation	8	8 100 000	1 725 000	77 500	104,52	22,26
1970 *Sources : Leach (1973), Bel et al. (1978), CNEEMA (1979)*						
4 - Mechano-chemical artificial grassland	50	12 660 000	6 285 000	2 260 000	5,60	2,78
5 - Mechano-chemical wheat cultivation	50	32 750 000	26 375 000	4 000 000	8,19	6,59
6 - Mechano-biological wheat cultivation	40	26 200 000	19 825 000	1 330 000	19,70	14,91

Commentary: In 1870, the energy production of a natural area (A1) is enhanced by human and animal labor (A2,3). It is significantly improved by 1970 with the introduction of mechano-chemical methods (A4,5,6). However, only energy productivity (production / consumption) is capable of generating energy accumulation in the biosphere. It is entirely positive for natural areas (B1), and remains very high in 1870 with human and animal labor (B2,3), at the same time that production (A2,3) increased. But by 1970, while energy production has greatly increased, mechano-chemical methods have simultaneously generated more entropy, causing energy productivity to drastically decrease (B4,5); although organic farming has marginally improved it (B6).

Which indeed proved to be the case in the 20th century (see above).

As they couldn’t measure this entropy, and moreover considered that there was no bridge between use and exchange values, Engels and Marx feared collapsing, as Eddington would say, "in deepest humiliation," and rejected this theory, sending Podolinsky back to his origins. This same principle has since influenced all ideas about alternatives to growth. Examples include Nicholas Georgescu Roegen (*The Entropy Law and the Economic Process*, 1971) with "Degrowth" [11], as well as its radical counterpart, which could be called "Overgrowth" because it seeks to push the dissipative expression of the economy to the apex of its "cosmic" direction (Raine, Foster, and Potts, The new entropy law and the economic process, 2007). To the extent that Ignacy Sachs, co-designer with Maurice Strong of "Ecodevelopment," this beautiful promise from the time when they jointly led the 1972 UNCED, could be confused with "Sustainable Development," which they would later champion while directing the 1992 UNCED. This continues today with the concept of "Ecological Footprint," which has not been able to resolve this issue, as its creators have acknowledged[12].

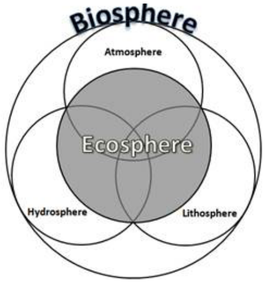
The "Ecological Balance" initially addressed this question of entropy, drawing in particular on the work of W. Vernadsky, the father of the Biosphere (13), and further that of biodiversity and the measurement of living energy, with the crucial problem of Information Theory, which measures only positive entropy. The concept of œgrowth could therefore be envisaged; it implied an economy that would reverse both the effects of neguentropic pillaging of the Biosphere and the Ecosphere (14), as well as those of the Anthroposphere. This would occur through a "biogrowth" (see note 2) that would one day involve not only plants and animals but also human ethics and poetics.
Although its formal measurement, already complex in its understanding, would undoubtedly be even more so in its implementation, and even more so in scaling up the territorial levels of our societies, the preliminary method exists! Would the game of its implementation therefore be worth the candle?

Richard Loiret is Agronomist and Thermician, and holds à PhD. in Ecological Economics. With the participation of Paul-Emmanuel Loiret, Architect, Prof. for this article.

(1) Here, "energy-matter" bears some similarities to the mass-energy "E" of Einstein's equation (E=MC2), in the sense that it relates energy to mass. However, here it is a "living" mass, illustrating the essential participation of life in the biosphere's energy accumulation function, when it transforms free energy into energy mass. Throughout its transformations, the variation in energy density (or pressure, in joules/m3) of living matter and its variation in mass density (in kg/m3) are indeed strictly correlated (See (8), Table No.7, p 195). Energy-matter thus refers, like the notion of "exergy," but in a more (thermo)dynamic way, to the energy embodied in all forms of matter produced by the action of autotrophic organisms. This includes living matter (and organisms) as well as inert matter, known as biogenic matter, directly derived from life (dead wood, humus, limestone, etc.), or indirectly (oxygen, spring water, sediments, etc.) - see (13) for more details - and as found everywhere in the biosphere "and" the ecosphere (14). Thus, the economy is nourished almost entirely by energy-matter, with a scope much broader than carbon-energy (4).

(2) From this, we can deduce that current growth (of global GDP) is nothing but "necrogrowth," or even better, "abiogrowth," as opposed to "biogrowth", because it certainly feeds on life and its energy (as living beings do), but in a system that does not regenerate it and gradually suffocates it, resulting in ever-widening destruction of the planet, beyond just climate change. Note: The concepts above in quotation marks were conceived by Paul-Emmanuel Loiret, to juxtapose financial growth of a materialistic economy with living growth.

(3) Of course, this refers to the well-known chemical equation concerning the transformation of carbon : CH2O + O2 = energy + CO2 + H2O



(4) Carbon energy refers to the energy contained solely within the organic carbon of wood, crops, fossil fuels, etc. It is now accurately measured in the "carbon balance sheets" proposed by the ADEME.

(5) Loiret, R., Une écotaxe "affectée" au développement durable de l'agriculture et des territoires (Un principe d'écologie non punitive), 1994. https://hal.science/hal-04488636

(6) Berque, A. ÉCOUMÈNE. Introduction à l'étude des milieux humains. Ed. Belin, Paris, 1987.

(7) The two novel terms, Œgrowth and Eugrowth (in their French translation), along with their shared definition, have been trademarked. This is not to prevent you from freely sharing the concept, but primarily to prevent individuals with malicious intent from appropriating and/or misusing, whether knowingly or ignorantly, both their names and their associated definitions and content for their own gain or otherwise. This is a precaution we take due to frequent observations of such occurrences.

(8) Loiret, R, Le Bilan écologique. 2016 (NNT : 2016SACLV001) https://hal.science/tel-01306180, Doctoral thesis in which all concepts related to Œgrowth are extensively studied and explained.

(9) In its thermodynamic version, this balance (8) provides us with the Distance to Equilibrium (negentropy minus entropy) of life, which specialists will note tha it represents the other possible facet of Clausius balance when, in his 1865 article (“Sur diverses formes facilement applicables qu'on peut donner aux équations fondamentales de la théorie mécanique de la chaleur”), he deduced, in the pure logic of the dominant paradigm of the time, that the entropy (positive) of the universe tends towards a maximum.

(10)This was as big a mistake as Einstein's when, introducing the cosmological constant into his equations of general relativity, he "neglected" a remark in 1918 by Erwin Schrödinger, who considered that this constant implied the existence of negative pressure contrary to gravity, and that therefore an "additional component" had to be added to the content of the universe. Einstein had missed the expansion of the universe (Françoise Combes, Collège de France, La constante cosmologique : la plus grande erreur d'Einstein). Schrödinger later added another layer to this remark in What is Life?, where he extensively discusses negentropy, this "component" of the universe, and at least of Earth, which was "neglected" by Arthur Eddington. Moreover, would this component, seen from a different angle, be of the same nature as the first?

(11) Georgescu-Roegen, N. La décroissance. Entropie-Ecologie-Economie. 1979. Electronic edition.

(12) Wackernagel, M. Thesis. Ecological Footprint and Appropriated Carrying Capacity: A tool for planning toward sustainability. The University of British Columbia, 1994.

(13) Loiret, R., La Biosphère selon Vernadsky. Contradiction du principe de Carnot. 2012: https://hal.science/hal-00911684

(14) While the concepts of Biosphere and Ecosphere are often confused, their semantic distinction (see (13)), which notably distinguishes carbon energy from the energy of life, proves fundamental for the proper functional understanding of planetary ecology.

Far from the State: a Peasant Notion of Public Order

XAVIER FOURT

Democracy, the republic and the public exercise of reason are neither urban phenomena, nor phenomena whose necessary corollary is the development of trade or the spirit of the Enlightenment. Peasants precociously developed systems of self-government[1]. German philosopher and sociologist Jürgen Habermas admits to having underestimated rural public space[2]. In the Middle Ages and during the European Renaissance, thousands of villages had an assembly of inhabitants where collective decisions were made concerning the community.

Historically, peasant culture established a certain type of public order, a way of forming society, a certain way of establishing the future. This rural peasant public order, located far from towns and cities, was transformed with the intrusion of the modern nation-state. Thus, a peasant public order (peasant republics of peasant public spaces) and an urban public space became separate. But the separation of one from the other was not so marked, because, as historian Georges Lefebvre points out, the exodus of rural communities, gradually deserting the countryside to concentrate in towns from 1850 onwards, transferred peasant communalist culture to urban and industrial areas. It was a transfer of peasant ethics to the new urban working class world, with the rural community providing the roots of the urban socialist demand for equality[3].

The notion of public order

The confusion surrounding the state's definition of public order is evident in the dual use of the term "police", which refers both to government activity and to the political community (polis). In French law, the term "ordre public" first appeared in the 17th century[4]. But the notion of "ordre public" is coextensive with that of an ordered political community, without judging the mode and regime of ordering. The adjective "public" in "ordre public" refers to the word "people". It should be distinguished from "state" or "public institutions". In Latin, publicus refers first and foremost to the civic function of populus. But the word "public" also designates a structured, discursive, deliberative or dialogical assembly of those with rights (Habermas), a group of people who worry, question, investigate, experiment and discuss in order to define a problem that concerns them (Dewey). A public order is the institutional realization of a community of humans that sets rules for itself, with or without a state – that orders beings and things to establish peace, in other words, a just order (kosmos). There are public orders without a state, and legal orders without a state, which are not necessarily anti-state, but which seek to circumscribe the state's authority, spheres of action and prerogatives. Nation-states have claimed the right to define what is "public" and "public order", in the name of defending the general interest.

We can point to the existence of public orders without a state, and move away from the division, inherited from Greek political philosophy, between private (family, tribal) and public. The exercise of public action does not, in principle, presuppose an absence of attachments, particularly in local public spaces. The modern division between private and public makes the public the fundamental basis for legitimizing state sovereignty, and public law a set of legal rules governing the political, administrative and financial organization and functioning of the state. However, public law can exist without a state, as can a local legal order. We won't dwell on these aspects, which would require specific investigations. However, based on the distinction between imperium and dominium, between administration of a territory and possession of a territory, it is conceivable that a cultural territory could establish a social order without a state, accompanied by a local law without a state, a judicial system, fiscal and budgetary authorities, a currency, and appoint civil servants, etc[5].

Historically, in France, it is not easy to account for this public order far from the state, that is to say, far from the towns, weakly or not constrained by it, as legal writing only appeared later on and only very slowly made its way into the countryside. So, there existed a public order that was not regulated by the written word. This public order was gradually overtaken by the market and the state, which changed social relations and, more generally, the relationship with "invariable matter, such as water, woods, harvests, vines, animals... and everything that the earth bears in its bosom or on its surface"[6].

Public order in the towns and public order in the fields and woods

Describing this public order without or far from the state implies investigating a culture - peasant culture - which defines it, and which gradually evolved with the intrusion of the market and the state.

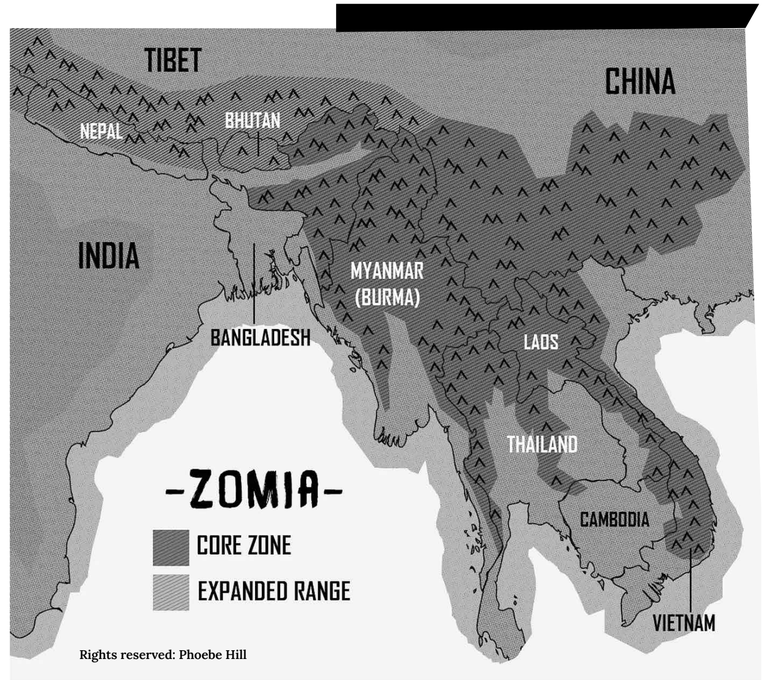
At the beginning of the 20th century, the peasant-writer Émile Guillaumin again contrasted the "bounhoummes" or "laborers", and "those of the bourg", the bourgeois[7]. He also distinguishes between those of free peasant or family communities and those of large bourgeois farms with their sharecroppers. But he also contrasts these two with those of the village community: farm boys and village boys. The two communities don't frequent the same inns. The former are quiet, while the latter know how to talk, have been to school, and fare better under questioning by the local town court after a village brawl, because they are less impressionable and express themselves more easily[8]. Another distinction could be made between people from the plains and people from the hills, the "easy" land of the lower country, along the river, and the "difficult" land of the upper country, the land of cereal crops and the land of livestock.

This public order of fields, woods and fallow land, this public order of "sunken paths" accessible only on foot or by mule, is a society far removed from the state. The muddy paths predate the state's paved roads, connecting inhabited islands surrounded by cultivated or grazed areas.

On the prairies, hamlets and farms are "islands of land", each with its own environment, like oases cut off from other lands by deserts. An "island of land" establishes a certain moral economy: each farm is surrounded by a small sea of pastures, fields or woods, which isolates it from its neighbors, singling each one out and developing an agricultural "organism" that is both special and monotonous. But here, the "island of culture" is not, as the geographer Émile Gautier[9] said of the Saharan oases, a penal colony. Each isolated world is not a prison: "Island peoples are more inclined to freedom than peoples on the continent," said Montesquieu[10]. It's a place conducive to self-government: as Aristotle says, there's a relationship between the size of the population and the system of laws: "The ideal limit for a state is the greatest possible extension of the population compatible with a self-sufficient life, and which can be easily embraced at a single glance."[11]

By settling on these islands of land, the new urban dwellers who take up permanent residence in the countryside will gradually adapt to the specific culture based on its socio-spatial determinations, embracing these forms and the habitus that shape them: a landscape is a culture, a set of values that will gradually impose themselves, reviving rural public orders.

To speak of poor land, unproductive land or a backward region is an economic notion of the territory, an agronomist's notion, or a farmer's notion subject to the constraints of the market. It implies being able to compare the yields of different territories, and wanting to make the most of the land, not depending on it for subsistence. Land must be "of good or bad value", a bourgeois vision that is certainly not that of a peasant subject to the constraints of self-subsistence... Poor lands that nobody wants, that are weakly controlled, weakly productive, serve as a refuge for dissidents and rebels who wish to live without a master, in the manner of the "Zomia" described by anthropologist James C. Scott[12]: poor land is a moral and social fact.



In his book published in 2009, *The Art of Not Being Governed: An Anarchist History of Upland Southeast Asia*, James C. Scott examines how for two thousand years, the disparate groups that now reside in Zomia (a mountainous region of 2.5 million km² that comprises portions of seven Asian countries) have fled the projects—slavery, conscription, taxes, corvée labor, epidemics, and warfare—of the nation-state societies that surround them.

(1) Moriceau, Jean-Marc, *Terres mouvantes. Les campagnes françaises du féodalisme à la mondialisation* :1150-1850, Paris, Fayard, 2002 & Bloch, Marc, *Les caractères originaux de l'histoire rurale française*, Paris, Armand Colin, [1931], 1976.

(2) Habermas, *L'Espace public. Archéologie de la publicité comme dimension constitutive de la societé bourgeoise* (1962), Paris, Payot, 1993, p. VI–VII & Boucheron, Patrick et Offenstadt, Nicolas, dir., *L'espace public au Moyen Age. Débats autour de Jürgen Habermas*, Coll. Le Noeud Gordien, Presses Universitaires de France, 2011.

(3) Lefebvre, Georges, *Etudes sur la Révolution Française*, Paris, Presses Universitaires de France, 1963, p.349.

(4) Forlen, Antonin, La dimension historique de la notion d'ordre public. XVIe-XIXe siècle, Thèse de l'Université de Strasbourg, Ecole doctorale 101, 2016, p.16.

(5) Chaumette, Anne-Laure, "Les administrations internationales de territoires au Kosovo et au Timor : expérimentation de la fabrication d'un État", *Jus Politicum*, n° 13, december 2014.

(6) Jean-François Fournel, *Les lois rurales rangées dans leur ordre naturel* (1808).

(7) "Les habitants du bourg apparaissent souvent comme des privilégiés par rapport aux paysans des écarts" ("Town dwellers often appear as privileged compared to peasants in the outlying areas.") (Bergerat Alain, "La Société Rurale du Bourbonnais à l'époque du Père Tiennon ". In: *Cahiers de Fontenay*, n°24-25, 1981. Représentations du peuple. pp. 21-4).

(8) Guillaumin, Émile, *La vie d'un simple*, Paris, Stock, 1943:103

(9) cité dans Febvre, Lucien, *La Terre et l'évolution humaine. Introduction géographique à l'histoire*, Albin Michel, Paris, [1922], 1970

(10) Montesquieu cité dans Febvre, Lucien, *La Terre et l'évolution humaine. Introduction géographique à l'histoire*, Albin Michel, Paris, [1922], 1970, p. 224.

(11) Aristote, *Éthique à Nicomaque*, IX, 10, 1326b

(12) James C. Scott, *The Art of Not Being Governed: An Anarchist History of Upland Southeast* Asia, 2009.

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https://laboratoryplanet.org Contact >> lab@makery.info

Future Peasants

BUREAU D'ÉTUDES

If one day the Moon becomes a host for agriculture, it will be in containers, managed by robots. The ancestor of these containers is the plantation. Modern plantation agriculture was foreshadowed in the late Middle Ages around the Mediterranean, in Cyprus, Crete, Sicily, southern Spain and Madeira. These were plantations of olives, vineyards, sugar and fruit, run by Arabs, Venetian and Genoese merchants. This plantation system spread around the world with the expansion of trade in the 16th century and the centuries that followed, right up to the present day, proletarianizing living beings – humans, animals, plants, microbes – all over the planet.

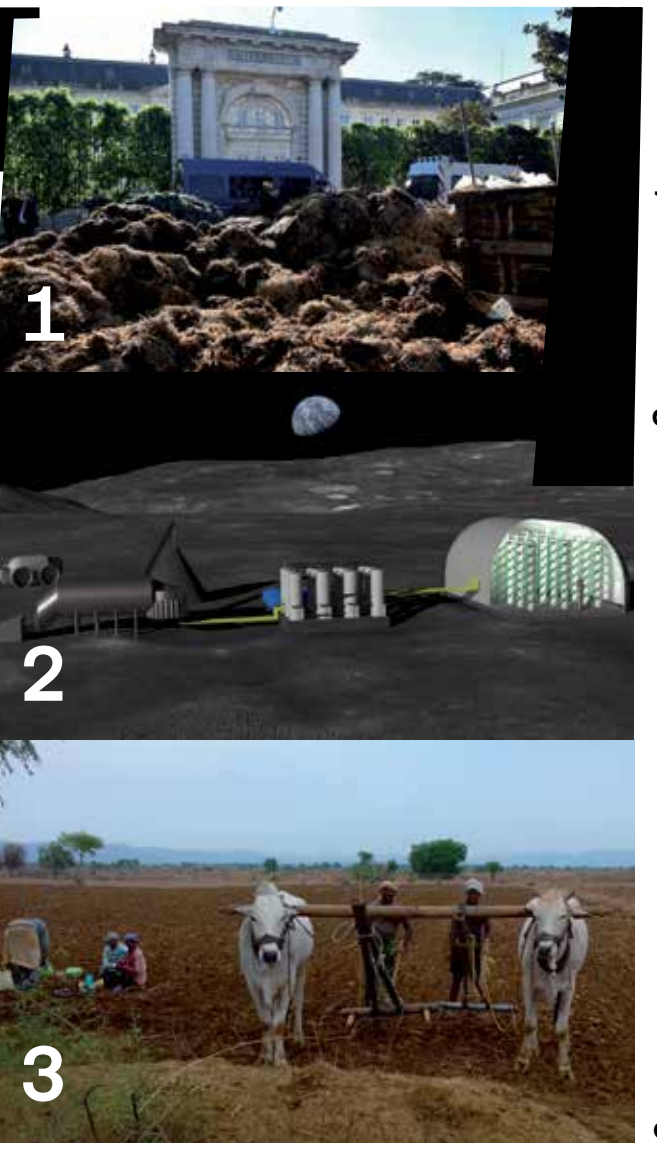
For better or for worse, this is not the majority story of world agriculture. Peasant farms that are relatively isolated from the growing pressures of capitalism have struggled for centuries to maintain their self-sufficiency. And others have fought and are still fighting to maintain their economic, cultural, social, political and moral independence [7].

Capitalist modernism has sought to dismiss these peasant modernities from history. Yet today, hundreds of millions of farms are inventing territories that are very different from the 1% of farms worldwide, which now account for 70% of all arable land [8].

In these global laboratories, other futurisms have sprouted and continue to grow, far from international organizations and industrial complexes: laboratories that cooperate on a daily basis with the biocenoses of the planetary holobiont, already establishing a post-urban age: futurisms of peasants, indigenous peoples, migrants and creoles, from continents and islands, in the center and edges of Europe, Africa, South America, Central and East Asia, the Indian peninsula, the North Pole and the far reaches of Canada or Siberia. Socio-ecological commons such as *satoyama* in Japan, rice terraces in China and the Philippines, cultivated forests in South Korea, agroforestry systems in Indonesia (*dunsun*) and the Iberian Peninsula (*dehesa*), mountain pastures in the Alps and Jura, agroforestry crops in southern Germany.

We imagine these living territories scattered, forming the nodes of a mycelium, distributed all around the globe and in space. In this peasant futurism, the Earth is not a globe whose scale relegates localities to insignificance. For there is no separation of scales: the Earth's destiny is the product of tangled local causalities. The Earth we're talking about is not that blue globe photographed by military aircraft from space. It's here, under our feet. It is what we are, as what happens in the ground produces what happens in our own intestines. Today, it is the movement of hundreds of millions of urban dwellers, perhaps billions, who, along with thousands of plant and animal species and torrents of bacteria and viruses, are migrating as the southern heat becomes too arid, soon restoring rural societies, forms of existence and arts to northern spaces. Whereas the European migrations of modern centuries have massively destroyed the populations of colonized territories[9], we want to work toward a different migration policy for the current century – one that aspires to the cohabitation of species, cultures and imaginations.

This hypothesis of the future, for the 21st century, is not a new Kolyma and its gulags of gold mining. We're not talking about the forced villages imposed in Russia, Tanzania, Cambodia, Ethiopia or Somalia. Nor are we speaking in the name of the great monetary or proprietary regulations that a few impose in the name of the common good. For the terrestrial community does not subordinate the multiplicity of parts to the oneness of the whole, and does not regulate the multiplicity of parts - people, resources, ideas - in the name of governing the whole. Not because it shouldn't, but because it's impossible.



1 Les agriculteurs de la Coordination Rurale manifestent leur colère à Agen en bloquant l'accès de la préfecture avec du fumier (2024).

2 Agriculture de plantation dans un espace sans humains. Treatment of lunar soil to create fertilizer for growing plants exclusively depend on draught power and animal-drawn implements. (Malyaj Shrivastava and Kanna K. Siripurapu, Consultant, WASSAN – RRA Network | September 2, 2020).

3 According to the Government of India, out of 141 million hectares of net sown area, 86 million hectares are rainfed. About 90% of landholdings of the country are distributed among the small to semi-medium farm holdings. And talking about power utilization in Indian agriculture, about 70% of the small and semi-medium landholding farmers almost

Laboratories for habitable futures

In 1970, in his song Whitey on the Moon, the precursor of rap Gil Scott-Heron spoke of the poverty of black plantation workers as white astronauts set foot on the Moon. A little later, in Burkina Faso, President Thomas Sankara proposed that 1% of the space conquest budget be devoted to the preservation of trees and life[10], and imposed that every newcomer to the country plant at least one tree, rather than show a residence permit[11]. Our terrestrial situation faces the paradox that vehicles have crossed over icy terrain all the way to the planet Mars, but we still don't know how many species exist on Earth. The living worlds on which we depend remain poorly understood, and we have forgotten how the society we form with them is organized.

The planetary laboratories that we have begun to survey here have inherited this interest in living worlds, giving rise to rural, agrarian, peasant, migrant, tropical, queer, indigenous and disabled futurisms, which prefer the analog space of existence to the virtual spaces of the control society.

Although less productive than mechanical and chemical agriculture, the peasant planetary laboratory is more efficient from an energy point of view, increasing the amount of solar energy accumulated on Earth and reducing the amount dispersed. This laboratory has also been able to cohabit peacefully with microbes, inventing arts and pedagogies of the living. In contrast to the biological universalism of the biopharmaceutical industries, and the biological equivalence of bodies, it has opposed the necessary contextualization of health and nutrition, pointing towards a medicine of territories, where the modalities of health vary according to place and environment[12]. Finally, this planetary laboratory has developed, and will need to develop, a culture of hospitality, of hosting, of hybrid spaces and situations, of symbiosis too, as environments leave the relatively stable conditions of the Holocene.

(7) Enrico Dal Lago, *Agrarian Elites: American Slaveholders and Southern Italian Landowners, 1815 – 1861*, LSU Press, 2005.

(8) 475 million farms of less than 2 hectares still exist in the world today (Sarah K. Lowder, Jakob Skoet, Terri Raney, The Number, Size, and Distribution of Farms, Smallholder Farms, and Family Farms Worldwide, *World Development*, Volume 87, 2016). In the European Union, 50% of farms have a surface area of less than 2 hectares, but they only exploit 2.4% of farmland.

(9) Between 1750 and 1930, 50 million Europeans migrated, driven from behind, as the European population grew, but arable land did not. Updated United Nations projections show that Africa's population is set to double between 2010 and 2040, from 1 to 2 billion people (four times the population of the EU28). A migration of 200 million climate migrants is predicted for the current century.

(10) Silva, *Actes de la conférence sur l'arbre et la forêt*, Paris, 5 au 7 février 1986.

(11) Speech given on 25 April 1985 in Bobo-Dioulasso.

(12) See Rupa Marya & Raj Patel, *Inflamed: Deep Medicine and the Anatomy of Injustice*, Farrar, Straus and Giroux, 2021.

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The Laboratory Planet

Our planetary laboratories are soil assemblies

*soil assemblies,
agricultural art,
food sovereignity,
subsistance agriculture,
custodian farmers,
living pedagogies,
territory-schools,
permaculture,
bioregionalism,
permacircularity,
sail freight,
immigrant peasants,
bocage,
resilient agriculture,
biodynamy,
weathered esthetics,
microbian terroirs,
microbiota,
energy resilience,
regenerative energies,
humuspunk,
global photosynthesis,
solar share*

Germany, Lower Saxony, Emmerthal, near Hajen, left bank (Axel Hindemith, CC BY-SA 3.0).
Hunger stones are monuments commemorating or foretelling famines: installed or engraved during major droughts, they act as a warning against the collapse of agricultural production following a lack of rainfall or irrigation capacity. The drought of 2022 in Europe provokes widespread rediscovery of hunger stones in Eastern Europe.

Soil erosion is as great a threat as global warming[1]. At a time when international agencies are suggesting that we increase food production, some scientists are expecting a further drop in agricultural productivity of around 30% in the coming decades due to soil erosion - 80% of land is affected by erosion classified as moderate to severe.

Why should we organize soil assemblies?

A soil assembly is a terroir, an assembly that recognizes that the soil is a determining factor in the originality and quality of what it does. Conversely, it also acknowledges that this originality is defined by a human community, which, over the course of its history, has built up a set of distinctive cultural traits, knowledge and practices, based on a system of interactions between the natural environment and human factors. A soil assembly is therefore not just a soil, a substrate that qualifies products, but also an associated community that works it, reveals its originality and gives it its typicality[2]. It's an artifact, the slow product of centuries of effort, marking the collective work of numerous companion species.

"All surface-dwelling organisms are ultimately dependent on soil biodiversity for food and habitat. (...) Human health and national economies are largely based on the benefits derived from soil."[3] Humans derive 99.7% of their food from cultivated land; plants, animals and microbes living in intact soils engage in living processes that regulate many elemental cycles[4].

So what is a soil assembly?

A Soil Assembly is a process of assembling various collectives, networks and institutions, sharing their histories, ideas, knowledge and organizational, pedagogical, agricultural, militant, artistic and scientific capacities around living soils and the regeneration of damaged or destroyed soils. It combines approaches that are sometimes considered incompatible, at the junction of art, design, research and practices, especially farming practices, crossing institutions, research laboratories, networks of independent practitioners and local territories.

So as not to subordinate processes that are slow or not mobile, weakly connected or local, to institutional, entrepreneurial or metropolitan contexts that are fast, mobile and highly connected, Soil Assemblies are organized by groups that respect different levels of action (institutional, local, network, etc.) and contribute to assembling them in a specific and contextual way each time, with respect to their diversity.

Soil Assemblies aim to replicate themselves, to establish in different regions and localities assemblages of educational, agricultural, activist, scientific and artistic initiatives. Soil Assemblies as a whole are organized from the bottom up, for now in a non-formal way, inspired by the structure of international networking in organizations such as Via Campesina. So, if some regional or local groups want to appropriate the format to organize an international or regional Soil Assembly, it's possible. Simply respect the few basic principles listed below and, above all, remain in dialogue with one another to stimulate crossovers.

(1) Tim Radford, "Soil Erosion as Big a Problem as Global Warming, Say Scientists," Guardian, February 14, 2004

(2) Dictionnaire des biens communs, Puf, 2017.

(3) Cheryl Dybas, "Life Underground Critical to Earth's Ecosystems," National Science Foundation, July 29, 2009.

(4) Susan S. Lang, " 'Slow, Insidious' Soil Erosion Threatens Human Health and Welfare as Well as the Environment, Cornell Study Asserts," Cornell Chronicle, March 20, 2006. Lang stated that soil erosion is, after population growth, the biggest environmental problem facing the world, yet this problem, which is becoming increasingly critical, is being ignored.

Principles for Soil Assemblies

The purpose of a SOIL ASSEMBLY is to :

LEVERAGE the power of art and design to create a living pedagogy that touches people's hands, hearts and heads.

SEED a global network of creative collectives and artists, activists, designers, farmers, chefs, scientists and technicians who are critically committed to living soil, biodiversity and landscape conservation.

INFORM about formal and non-formal teaching methods for critical eco-competence, so that new generations can contribute to the collective regeneration of degraded landscapes.

PRESENT living laboratories, innovative projects and communities working at the interface of agroecology, the arts and citizen science.

A Soil Assembly is an actor of the territory where it is organized.

Underground Subsistence

Feeding beings in the Andes of Ecuador

PEDRO SOLER

It's 10 in the morning, in an open field, and we are standing around a woman seated in front of an altar spread out on a cloth. The altar is colorful, full of sweets and fruits and stones. A hole has been dug in the ground just beside it. Violeta is asking for permission, talking to the land, singing as she shakes a rattle. She tells us that the land likes sweet things. One after the other, everyone takes something from the altar and throws it into the hole, thanking and feeding the land. Some women cross themselves as they throw in their orange. And then the hole is filled in with earth.

We are in the time of Pawkar Raymi, the March Equinox, in a workshop organized by La Divina Papaya on their farm in Kayambi territory. It is the time of tender grains: corn on the cob and frijoles, lentils and peas, chochos and broad beans and the soup called fanesca made with this harvest and more, 12 ingredients in total, from the Andean chakra or garden. Time for everyone in the community to eat abundantly. Traditionally, nobody is turned away, just as in the chakra no plant is sown alone, plants are also families and communities, they become sad if isolated. The recipe for fanesca is resistance and a guide, instructions of what and when to plant, memory and future of diversity, abundance and collectivity.

Not all the compañeras have come today because they've been busy selling their grains for people to make fanesca, but quite a few did. Now we are going to make a different kind of fanesca. That's what Julio, a member of the Ekorural foundation and agricultural investigator, says as he introduces the workshop: "This is a fanesca for the soil." He starts by asking everyone to participate in organizing the numerous seeds we have brought on a grid laid out on the ground with growth rate on the x axis and required sunlight (which is often the height but not always) on the y axis. Plants feed the life of the soil with their exudates on which fungi and bacteria thrive, feeding in their turn all the other vertiginous cycles of the soil. Then we prepare food for all: rock powder for bacteria, leaf mold from the woodland floor, different composts, pea flour for the fungi, some sand. Everybody participates in throwing everything together, adding the seeds and then mixing it all together.

Knowledge and practice of Uku-Pacha

Most of these indigenous peasants are women now in their fifties, who have spent their whole lives practicing subsistence agriculture in their chakras. Others are younger peasants who stayed home (or, more rarely, got an education and came back), along with educated post-urban people. Their meeting provides a space for transferring knowledge, building food sovereignty and hopefully surviving through these coming decades of collapse. While the most august scientific bodies have been calling for the agro-ecological transformation of agriculture for quite some time now, in reality those who practice these arts, who have been practicing them for millennia, constitute the poorest and most abandoned sector of society. We live in an upside-down world.

In Andean cosmovision, the word Pacha refers to both time and space - so the three pachas that make up the cosmos, above, in-between and below, are real places that accumulate time in layers or spirals. The pacha of the soil, as well as the inside of the body, is Uku Pacha. Uku means inside. Great care should be taken in relation to this realm, residence of the huge serpent Amaru, of the dead and the yet unborn. All underground water is included there too, springs, the bottom of the sea, our internal organs. Each of us is a little world too, and there is no hell below us. The complex interplay of time and space that makes bodies and worlds is always tending toward balance and complementarity. When things get way out of balance, then there is a drastic correction or reversal, an upheaval and change of cycle, called Pachakutik.

Looking South and West from the field, on the horizon are massive greenhouses, filled with roses, generators, pumps, machines grinding up rose stalks for compost, ultra-low frequencies. The rural world is a battleground now. Agribusiness snaps up the land of migrants, peasants tired of being poor or disconnected heirs, and transforms them into highly technified, productive greenhouses. It is an industry that generates a lot of money, the fifth-most important export of Ecuador, but screams fragility, completely dependent on fossil-fueled airplanes to deliver a non-essential good to the North, at a huge environmental cost. The combination of economics and emissions means that it has no viable future, yet it all just gets faster, bigger, wider. Now the majority of young people here work in the flower greenhouses. They don't cultivate anymore and eat processed food from the corner shops. A wage instead of a garden, and then there are no more gardens.

Credit: Mateo Barriga Salazar

The good life: getting together with others

When Maria Mies studied subsistence farming among women in Bangladesh in the 1980s, she found that it was the key to autonomy and a good life. The "subsistence perspective" that she developed from these and other investigations is in explicit resistance to global patriarchal capitalism and its devastating impacts. It is life production instead of commodity production. In the Andes this is called Sumak Kawsay, good living: "Subsistence is not shortcoming and misery, as we are constantly made to believe. If it is understood correctly that is, and not as individual subsistence – which is not possible – then you always have to get together with others to do something, not only to survive, but to live well. Then it is actually possible to create the good life. You experience that you are your own authority, that together with others, you're sovereign."[1]

Now Julio has stopped explaining and everyone is working. The compañeras are planting trees and roses, filling in with the magic mix, soil food, soul food. They work fast, economy and power of their movements as they open holes for the plants, confident bodies in the frontier between worlds. The young men and women are there amongst them, one is operating the wheelbarrow, another is measuring the distances between the roses, others are planting. As the direct heirs of the peasant line get older, there are fewer and fewer young people to take up the mantle, and migration is having a huge impact on the rural areas.

But all this could change in a second, or at least in a few weeks, without diesel. During the pandemic, many young people returned to work alongside their parents or grandparents. The national strike of 2021 lasted 18 days, all the roads were closed, and local food production suddenly became of critical importance. All the prices went up, and then things went back to normal. But soon, there will be no going back to normal. The Pachakutik is here and a small farm or peasant future is now - as Chris Smaje[2] points out, "our best shot for creating future societies that are tolerably sustainable in ecological terms and fulfilling in nutritional and psychosocial ones."

Inevitably, as temperatures and sea levels rise in the tropical areas, everyone will be flocking to the mountains where there is still water and agriculture. They'll come from other parts of the Andes too, when the glaciers finally disappear. If an agro-ecological peasant transition were in progress, needing lots of hands, lots of organisms and with fair access to land, there would be work for them when they arrive: gardening, guiding water, building soil, tending to life. Subsistence work, collective work, with plenty of time for art.

But for this to happen there needs to be some sort of collapse or revolution, a deep cultural and existential change. Young people already migrate here in search of subsistence work under the vigilant gaze of armed guards in the greenhouses that cover the valley. Maybe starving refugees will soon work the greenhouses in return for only bad food and a dormitory bunk. Like the estates of the bad old days, but with cameras, machines and chemicals, or the fortified farms in the movie "Soylent Green".

Maize demands little work compared to the bounty of its harvests[3]. Potatoes wait beneath the surface until you need them, invisible to the conqueror's eyes. A diverse plant diet with a bit of guinea pig from time to time and chicken and chicha for a party. It's been done before, a good life of infinite imagination within the limits of subsistence, just as the poet Tao Yuanming wrote 1600 years ago in China:

"*At a single glance I survey the whole Universe.*
What pleasures can compare with these?"

Credit: Mateo Barriga Salazar

(1) Transcription of a video interview of Maria Mies by O. Ressler, recorded in Cologne, Germany, (2005). https://transversal.at/transversal/0805/mies/en

(2) Chris Smaje - "A Small Farm Future - Making the Case for a Society Built Around Local Economies, Self-Provisioning, Agricultural Diversity, and a Shared Earth". Chelsea Green Publishing (2020)

(3) 30 person-days per hectare per year to sow and tend and 10 person-days per hectare per year to harvest about 1200 kg., sufficient to feed a family of 4 people for 1 year. Gregory Knapp - "Andean Ecology - Adaptive Dynamics in Ecuador". Routledge (1991)

In mid 2025, a Soil Assembly (Tinku Uku Pacha) will be held in the community of La Chimba, near Cayambe in Ecuador, bringing together peasant farmers, soil scientists and artists. It will also publish a magazine, to be distributed with the Spanish language version of The Laboratory Planet, on initiatives and practises for soil health and regeneration in Latin America.
Enquiries and participation: ps@riseup.net

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"with the fields"

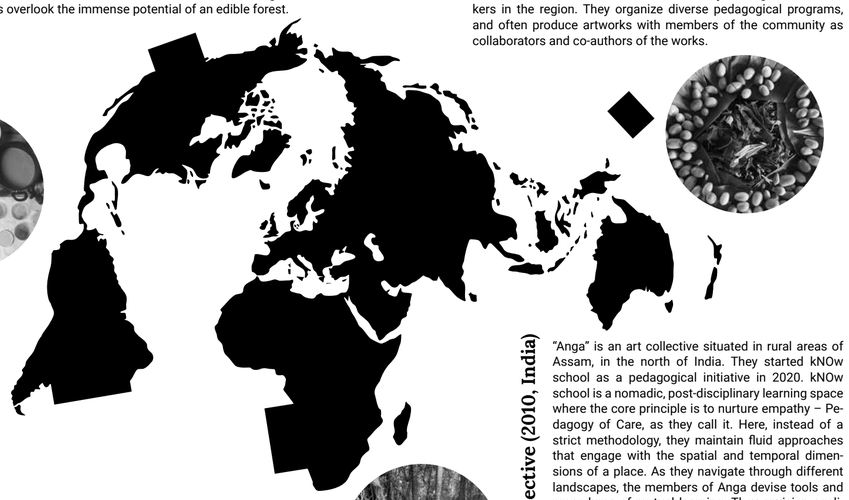
collective is a trans-territorial endeavor composed of visual art practitioners with links to - and activities within - rural areas of the Global South. Together, we work on a long-distance basis to share practices and concerns, while nurturing moments of reflection around sustaining our practices, which reverberate into our online gatherings. Through the diverse experiences of the collective members, we construct common bases from which to speak about rurality, decolonisation, coasts, biota and food, from our situated territories. We discuss the possibilities and complexities of artistic practice in our contexts - around field work, community engagement and activism at (agricultural and coastal) sites. On 26.02.2024 we gathered to reflect on "living pedagogies" and "the territory as a school". Beside are parts of the conversation between "with the fields" members **Salma Jamal Moushum** from Gidree Bawlee Foundation of Arts, **Nora Hauswirth** from Arte & Escola na Floresta, **Dhrubajit Sarma** from Anga Art Collective, **Paloma Ayala** and **tara lasrado**. Transcription by Navya Itty.

Arte & Escola na Floresta (2021, Manaus, Brazil)

As a model of solidarity, the Participative Agriculture of the Arte & Escola na Floresta collective offers theoretical but mainly practical knowledge to a wide variety of communities, including people from urban, rural and forest areas. Whether it's learning to build with bioconstruction, creating gardens, using natural dyes, cultivating native bees, or sociological approaches such as non-violent communication, we want to engage and develop forest methodologies and pedagogies to reflect on recent food practices, and change them. Interactions occur between different types of people and their knowledge. Participants come together to plant, harvest, and cook, guided by master farmers, engaging in the implementation of agroforestry systems, maintaining wild plant gardens (PANC Plantas Alimentícias Não Convencionais), soil management, etc. With a lot of volunteer work, we held 80 meetings attended by over 600 participants. Additionally, we managed to establish the association 'tera kuno' as the legal form of our collective body. Considering the unsustainable food system we live in and the reality of the state of Amazonas – where most of the food consumed comes from outside the state (90% from places located 3,000 km away by plane or 1,000 km away by boat) – discussing how to produce agro-ecological food locally is crucial to promote sustainable eating practices and value the role of farmers. In the current scenario, a large number of Amazonians overlook the immense potential of an edible forest.

Gidree Bawlee. (2001, Bangladesh)

Artists Salma Jamal Moushum and Kamruzzaman Shadhin run a community-based platform for artistic exploration within rural areas in the northern state of Thakurgaon. Here, a rich hybrid culture of indigenous traditions is affected by waves of settlers displaced historically by colonization, the privatization of land and today also by climate change. Gidree Bawlee's practice is rooted in the local community and nourished by experimental processes merging ancient cultural heritage with contemporary concerns. They use craft workshops, often with young people, and experimental forms of puppetry to address environmental issues in this area of marginal agricultural land under pressure from climate refugees and others. Moushum and Shadhin live and work directly with agricultural workers in the region. They organize diverse pedagogical programs, and often produce artworks with members of the community as collaborators and co-authors of the works.



tara lasrado

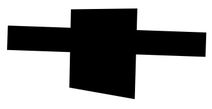
Tara is a producer and curator particularly interested in working on collective, experimental, intersectional and transdisciplinary collaborative works. Her practice-based experiences permeate and confront institutions in public spaces, no-spaces, agricultural fields and empty theaters. Since 2013 tara has worked in various constellations on production, curatorial, pedagogical and community projects on/with land-based, non-white, performative, and resistance practices. She has been practicing with experi_theater and Blackbox since 2020. As part of the experi_betriebsbüro, she works on production for various works of BIPOC artists and collectives. tara is co-producer of "under the mango tree": a self-organized gathering of unlearning and decolonizing practices together with small scale artist-led initiatives, schools and libraries. in 2020 she co-founded arvae.ch to cultivate art, science, community collaborations that question practices of transdisciplinary exchange and production(s). In a continuous collaboration with SAE Greenhouse Lab, she centers decolonial feminist perspectives on agroecology. tara initiated "with the fields" in 2022 as a trans-territorial collective to reflect on sustaining land-based artistic and community practices.

Anga Art Collective (2010, India)

"Anga" is an art collective situated in rural areas of Assam, in the north of India. They started kNOw school as a pedagogical initiative in 2020. kNOw school is a nomadic, post-disciplinary learning space where the core principle is to nurture empathy – Pedagogy of Care, as they call it. Here, instead of a strict methodology, they maintain fluid approaches that engage with the spatial and temporal dimensions of a place. As they navigate through different landscapes, the members of Anga devise tools and procedures of mutual learning. They envision egalitarian learning environments to think about the relationships between esthetics, pedagogy, and ways of life. In their post-disciplinary approach, they combine certain learnings from various disciplines with other ways of learning circulating among communities. The kNOw school program was the first activity supported as part of "with the fields".

Paloma Ayala (Mexico)

Paloma is a visual artist working at the intersection of domestic practices, environmental and post-colonial concerns. She moves between the US/MX border and Zürich. Educational activities and investigations on both ecological environments in urban, and especially rural and coastal areas, continue to be part of her practice. She runs coastal and rural community pedagogical programs together with cultural worker Javier Dragustinovis, supported by the "with the fields" collective. Coastal communities echo the very watery environment where they are situated: unstable grounds very much endangered by political and economic systems; fluctuating populations of human and more-than-human species living in a highly diverse ecosystem; migratory birds, insects and humans passing by lands of sweet and salty waters; ports and oil pipelines causing displacement of locals. In the case of agricultural communities, she works in Ejido Ignacio Zaragoza, where Paloma's family came to work as independent agricultural laborers and to develop into humans of the Rio Bravo/Rio Grande delta.



"Ghranena ardhabhojanam"

(When you smell something, you're already half fed)

On "living pedagogies"

N: What are the epistemological motivations / schools of thought / different kinds of knowledge / indigenous or ancestral knowledge?

T: We are remembering again and again why this collective came together, is being together: to reflect on artistic practices embedded in rural, agricultural or coastal communities, influenced with/by/together with the communities, other beings in these regions, and how we are constantly trying to resist, even if it's unconsciously, to romanticize this in or from the "urban cultural centers". What is the life, and the work to be done? It's not so separate; it is constantly feeding and nourishing. There is a living pedagogical practice, and those in the practice end up not defining it.

P: We don't know if it is resisting in the periphery or in rurality or the forest... or any other category shaped by the cultural center. We do works that respond to the immediate context, that speak to languages created in place... and also to art languages that we carry everywhere. It's about how to guide the relationship with other beings there as much as how to present these works in cultural contexts.

N: In our work with Arte & Escola na Floresta, we collaborate with farmers, and we notice that they're mainly observing nature and processes. So we collaborate and encourage them to keep observing and adapting. Through activities, we engage farmers to notice positive changes, such as certain plants growing better – unlike in conventional courses offered by the government that provide theoretical knowledge without tangible results. Traditional knowledge is fading, residing more in our bodies, beyond explanation.

T: We had a talk some weeks ago on technological interventions for archiving plants, benefits, knowledge. And who is this for? Who has access to it? So the topic of access was key to archiving practices. Moushum was sharing that in Balia, languages are orally archived. It's about how it works in the context and moving with practices for these communities. Who is living? Who is doing the pedagogy?

N: In reviewing research papers on traditional agricultural practices, I noticed significant differences in former community characteristics and land use. For instance, the practice of slash-and-burn farming involved using forests aged 30-40 years, burning minimally, and leaving substantial material for soil protection. However, contemporary locals burn annually, citing tradition without considering the holistic system of traditional practices.

D: Everything is useful. Coexistence with nature. Ancestral knowledge. We need to take it forward, study it. There needs to be distinctions there. So that's why Anga Art Collective gives more focus to the context we work in and the work we're doing. That means looking at the reality of the people. At the same time, we focus on certain practices that exist there in Assam. But we also don't want to romanticize it. For example, people use bamboo but they also use plastic, as it's more durable. And we shouldn't say "no, don't use plastic". Folk songs have also adapted "modern" elements like Michael Jackson and airplanes. What we should consider is that ancestral knowledge is not just birds and bees, it's always evolving, accepting new things in different ways.

P: So you think that's what the term "living pedagogy" is - contiguity, accompanying and working in closeness to the systems outside of the center?

T: The realities on the ground - and how you live and move are affected by that. It's constantly being adapted, influenced or diluted, therefore it is inherently living. Pedagogical systems are going to be different everywhere.

D: If we go deep into these ideas, it helps us understand our own context. We are trying to understand why people keep making art, and what is that art about... when there is no apparent use for it, probably to sell it? We are trying to study this in the context of a village, not in a contemporary art situation. And these are the living practices we are talking about. Why these kinds of toil, their world view, the reason for engaging in these activities, the psychology behind it. There are people working with us to build the houses, they have knowledge to build a stable structure, while we are giving them ideas. It is the idea of collectivity and collective ideas coming from different kinds of knowledge. Also sharing different kinds of labor to build a particular space. There is some element that triggers the bamboo artisan Jogindar to make something, maybe we are that element. So in this whole practice, there are a lot of complexities. In institutional spaces, complexities are diluted. But in the field, there is space for experimentation and a broader way to accommodate differences, "successes" and "failures".

P: It sounds very metabolic, in this living form.

N: I'm thinking about a conversation I was part of in the context of a ceramic atelier. I asked two farmers to go with me. The artists there work together to make plates and were asking the farmers, what is art for them? How do they see their art? They were pretty shy to talk, but they were talking about these observations, and living itself is art for them in a way.
P: Nora, you're always working with different people with different epistemological frameworks, like architects, technicians, artists, environmental scientists, farmers and so on. The space that you have developed is a platform to have these interactions between all these different kinds of people, and what they know. It's all to benefit the place where it is situated, no? To develop farming activities that are maintaining forest areas, or very connected to the preservation of the space, passing on knowledge, how to do that...

N: We are searching for the ways of knowing and understanding that shape educational and artistic practices. It involves exploring and acknowledging the various sources of knowledge, perspectives, and world views that influence our work. This may include traditional ecological knowledge, artistic perspectives, and other forms of experiential learning that contribute to our approach in integrating agriculture, art, and education.

M: One thing I find interesting about this conversation is the outsider view that we have - we all have been educated in westernized curricula, as all of us come from regions which were colonized - schools, colleges, universities. And when we come back here in the villages, we observe as outsiders. We tend to romanticize, it's hard not to. If we're not coming directly from a land-based community sharing the same way of learning, it's a hard wall to shatter. For us, initially we had this romanticized idea that everything was so great in the past, so in sync with 'nature', why are they using pesticides or herbicides... but slowly we came to the realization that the times have changed, and so have the ways of life, and so has 'nature' as we view it. It's important to observe how people have adapted to their circumstances, because nothing is the same as before. Knowledge evolves, adapting to the changes brought in by various factors specific to the region. Breaking that outsider barrier is our fight - coming from an urban context and trying to connect with the village. We have come to terms with each other and our core working philosophy now is like any agriculture-based community: always working, creating something, trying to find ways to connect and learn from each other through our collaborative efforts.

On "the territory as a school"

P: As art practitioners we make use of a lot of terms that circulate in the contemporary art lingo, but we develop work within contexts where living beings exist in quite different environments than where these terms were first imagined.

Passing on knowledge, learning and teaching what we have learned from either close or afar, creates connections that help with the continuation of life. It's a matter of reproduction, of cultural growth and de-growth. Like Dhruba was saying, it's metabolic.

I think that with "with the fields", we create access to the spaces where we work. There is always a description of territory involved. There's a specificity there because we are all involved and engaged with being a metabolic part of that territorial apparatus.

When I started working with these situated strategies and in a pedagogical way, I was also using terms like "open" or "living" pedagogies. But now I think it's not just about openness and the rejection of pedagogical approaches in urban centers. We are opening up access for our European public to learn as well... also very problematic. Why would we show a romanticized and digested version of what we encounter when there is also what Nora described before? There is sadness and loss. Death of cultures. An epistemological death (epistemicide) everywhere.
I am currently in a residency in Bolivia, where I'm working with a women's cooperative of clay artisans. They create their own economy and their own support systems. They're selling and they are the heads of their families. They make pots. But when I start asking about cooking or growing food, I notice that they don't know or they don't like to. The women would rather buy fast food. They do not remember how to cook tamales. They don't farm. I learned that there has been one generation of separation between being farmers and their current tourist-focused economy. But it is totally understandable! Soy and cocoa plantations are all around. The forest degraded from this. The agricultural land has been sold to big plantations, to companies and big land owners. The most important cultural heritage that they have preserved is their economical means: pots that are sold to tourists. It's beautiful to see how they bring their own children and these kids watch, learn and help out. They are carriers of an identity that is inevitably linked to global capitalist processes.

N: There are theories suggesting that the act of cooking and engaging with food preparation initiates a pre-digestive process. Nowadays, the significance of microbes and fresh food in relation to our health is not fully understood yet in the general society. Concerning rapid changes, especially urban people, might lead to a future where people no longer cook. Instead, dependence on third-party services for food production, health, and food security could become more prevalent, a prospect that is unsettling for many, including yourself.

M: I wanted to add, I'm trying to make a film about edible plants in the wild, but it's hard to find anything. At this time of the year 'Bothua shak' is available in the fields. Right after the harvesting of rice, the interim time before the planting of corn begins, this shak (leafy vegetable) grows in the field in abundance. But a couple of days ago, the farmers sprayed herbicide, so there are no edible wild plants left to forage in the fields. Here, the local name for herbicides and insecticides is 'bish' which translates to 'poison' in English. So now I'm looking for plants on the roadsides, as those are the only places that are not sprayed on. But a lot of the roadside plants or wild plants do not have their place in the kitchen anymore, as they are considered 'famine food'. So in a way it's also about financial and social status.

In the context of Thakurgaon, climate scientists predict desertification in the next 50 years because of depleting groundwater. But when we talked to the kids and elderly, they said that 30-40 years ago there were seasonal famines - 6 months out of the year they used to starve. There is a name for this seasonal famine, 'monga'. With the infrastructure developed for groundwater use, they now have the ability to grow rice all year round. Now, the people here have enough food in their houses. So how can you fight against something that is keeping people fed? We can't preach to go back to 'monga' because it's good for the environment. And now, because of the use of hybrid seeds, we need all kinds of herbicides and pesticides to grow the food which causes the wild plants to die. The knowledge of the fields is different now than it was during the time of monga, a lot of cultural elements have become obsolete, this is a major part of our research. But, human beings are very adaptable, so even if this land turns into a desert, they will find ways to cope with it. Like the 'shak' that appears in the fields every year, even though they are killed by herbicides over and over every year.

“Custodian farmers are the heroes of our times”

EWEN CHARDRONNET

Interview with **Vivek Vilasini**

This interview was recorded in January 2023, during the Srishti Manipal Institute interim Festival of Ideas. Art & design students from the group ‘Contained Multitude: A Handtaste of Complex Systems’, led by Maya Minder and Ewen Chardronnet, visited artist Vivek Vilasini’s Food Forest in Anachal, Munnar, Kerala, India. The students performed a collective dinner orchestrated by Maya Minder with Alaka Kavallur and Vivek Vilasini.
First trained as a Marine radio officer at the All India Marine College in Kochi, Vivek Vilasini went on to earn a Bachelor’s degree in Political Science from Kerala University in 1987, before turning to art and studying traditional Indian sculpture. In his work Vilasini examines our existing social structures, adapting various expressions of cultural identity prevalent in society today to raise questions about the continually changing global scenario that every individual struggles to keep up with. In 2008, he embarked on a journey to create a food forest in Munnar: the ‘Udumbanchola Initiative,’ named after the region.

Ewen Chardronnet: How did you become interested in food forests and permaculture?
Vivek Vilasini: In 1986, it was a chance meeting with Gopalkrishnan at KalaPeedam, a community art center and gallery. Gopalkrishnan and his wife were so inspired after reading Masanobu Fukuoka’s *One-Straw Revolution* that they left their jobs and went to one small barren hillock at Agali, and started experimenting with Masanobu Fukuoka’s natural farming. This place was initially a cleared-out forest land. Their efforts brought water back to the land. In the long conversation that I had with Gopalkrishnan, he introduced me to Masanobu Fukuoka’s philosophy and the book *The One-Straw Revolution*. The book was available from a nearby bookshop, so I got it immediately. It was really inspiring, a life-changing moment.
I started educating myself on agricultural philosophers, like Sepp Holzer, coming from the Austrian highland hills and also doing an exceptional way of farming. He was an unorthodox kind of farmer but he had reintroduced *hügelkultur*, mound culture in German, that involves piling logs and creating a mound. Within a year or two these logs would become a bit soggy and absorb water, and after two years, you don’t need to water the mound daily. So the water problem can be solved like that. The people in the Amazon were also using biochar, and there is also the Korean natural farming by Cho Han Kyu, where he introduces microbes into his farming. That reduces the use of fertilizers or pesticides. Just by mulching and introducing these microbes, multiplying these beneficial microbes, as well as introducing or inoculating them into the system, the plants could survive, they would get all their nutrition from that. That was also a very interesting concept.

And what triggered you to take action?
The first thing that really shocked me was farmers’ suicides in the early 1990s. A lot of farmer suicides were happening in India. We had this big green revolution in Punjab, very enthusiastically they bought fertilizers and pesticides and different types of genetically modified crops. What happened is that fertilizer got into the water tap because everybody was using borewells there. At first, you only had to dig 10 or 20 feet to get water, but then you had to dig hundreds of feet underneath. Then the water tap got contaminated, and people got a lot of diseases. I think of farmers’ suicides as a bio-indicator. It happened to be humans this time, but in this peculiar situation, agriculture is failing, and these poor farmers committed suicide because they didn’t have a better way to get out of this system.

In your food forest, it’s impressive how you’re expanding the local biodiversity. Can you tell us more about your philosophy in growing so many varieties?
We need to find new crops to find out what is possible. And I don’t think horticulturists in the past were doing their job very well, because we were shocked to find there were so many varieties of plants and edible fruits in other countries with the same kind of climate. Why weren’t we introduced to that, especially when these catastrophes are happening? There are a lot of young people consolidating and being custodians of rice or bananas or tubers. I have met and befriended many people in the course of this research. We started sharing planting material. I have around 46 varieties of yams, 12 or 13 varieties of colocasias. We have 16 banana varieties, but our friend has around 500 varieties of bananas- Maybe we won’t use those 500 varieties, but rather 100 good ones. Another person has 150-160 varieties of rice, including 14 varieties of black rice. All these black or purple colored vegetables or fruits etc., have a lot of goodness in them, like anthocyanins, which are good for our nutrition. I really respect these young custodians who are treasuring these varieties, and future generations will thank them for their painstaking efforts. In spite of not being funded or owning farming land, some of them are even planting on leased land.
I belong to several groups that collect and share these planting materials. There is a lot of interest among people because of the sheer luxury of access and availability of many alternatives to edible plants, fruits and leaves from our similar climate and geographical positioning. These custodians are keeping the genome alive, doing it every year, cultivating the rice, harvesting and preserving and repeating it every year. They have been doing it every year. And nobody is funding them, they are just doing it. I don’t know what’s inspiring them. A few people are keeping this activity alive, and I think they are the heroes of our times. It’s only later that people will be able to see the relevance of their activity. I have been documenting these custodians and their efforts.
When we went to these tuber research facilities, I found that they were working with very few varieties, now things are slowly changing. But we have been growing yacóns, jicamas, sweet potatoes, Okinawan sweet potatoes, stokes purple sweet potatoes and more. I think it is time that we change our idea of what to eat and what are the available alternatives. One should have the opportunity to choose what one wants. For me, that’s the guiding principle. That said, the ideas of fashion... politics... or religions... people should be able to choose. That choice, that democratic kind of situation has to be there. There are, of course, people talking about indigenous (plants) and things like that. My question is, ‘When was indigenous?’ In Munnar, in the hills, we have Rhododendron trees, Nilgiri Martins - a kind of small predator, or the Nilgiri Tahr (mountain goats) and a couple varieties of butterflies - their closest relatives are actually in the foothills of the Himalayas. These Himalayan Martins, Himalayan Tahrs and Himalayan Rhododendrons are those that couldn’t grow back during the last Ice Age, because it thawed very quickly, so they are on these (Nilgiri) mountains.
So, alternatives must be available to a maximum number of people. I am creating a workable model and I am hoping it will also inspire others to do something similar or better. There are a lot of people doing it around the world. I’m not saying this is a unique thing, but I’m just trying to integrate things that could be working in our micro-climate. To find out how plants grow. We grow apples here, and we are around 3,600 feet above sea level. I’m not saying you can grow Washington apple trees, but there are a lot of other low-chill varieties of fruits and vegetables that could be grown here.
That is the kind of experiment we are doing. We are trying to adapt to the age of the Anthropocene. Now it’s becoming a cliché, but how do you adapt to such a situation? That is the concern, and that is the project we are engaged in.

nursery at the food forest "Udumbanchola Initiative"

How have local farming communities responded?
I haven’t really opened up too much to the farming community yet. Some of them have come here. When our Hass Avocado tree bore fruit, it was one of the first trees to bear fruit in the region, so many farmers came to see it. I haven’t been able to distribute the Hass yet, but some other friends are propagating and distributing it now. Our space is more like a lab, as of now. I haven’t started propagation yet, I haven’t had the time for that. I am definitely going to look into it, as I want more and more farmers to have it.
While the sweet potatoes (purple sweet potatoes from South Africa), which were sold for 2200 rupees, could only be found in high-end gourmet shops in India at that time, I had grown them and distributed them to small farmers. Once a farmer whom I had given purple sweet potato vines called me after a couple of years and asked me if I could sell his crop at the same price. I told him I couldn’t help him to do that, but instead asked him to distribute most of his crop further and also try to sell it himself for a much lower price, so that more people could get it. What we are trying to do is to democratize these gourmet varieties of crops and reduce their carbon footprint. More people should be able to grow it and have it for themselves, as it’s very nutritious too. What people are buying for 2000 rupees, they can get for almost nothing if they grow it themselves.

Today, I am giving away sweet potato plants and telling people to give them to ten other people, whereas before I was giving away more to custodians, or to certain friends or custodians of tubers only. They’ve also given out tubers further, so more people are starting to appreciate the produce. The product hasn’t been popularized or anything, we haven’t gone very aggressively about that, but it’s slowly spreading, and I think that’s enough. We can do it slowly and steadily, that’s what’s happening. And I’m happy about that. It’s also nice to introduce plants and let more people enjoy them. People also share with me. I had a friend come up to me and say "hey, I’ve got this fruit from Panama," and he was surprised to see that we already had it. We even have Annona Spraguei from Panama. It’s a hairy custard apple. It’s quite a rare one, it’s like Rambutan, but it’s a custard apple with hair. Or Rollinia, etc. It’s quite common in our farming groups, and that’s where it’s distributed to all of us. At first, it was limited only to people seriously engaged in collecting and preserving a large biodiversity, but now we have enough to share with whoever is interested.

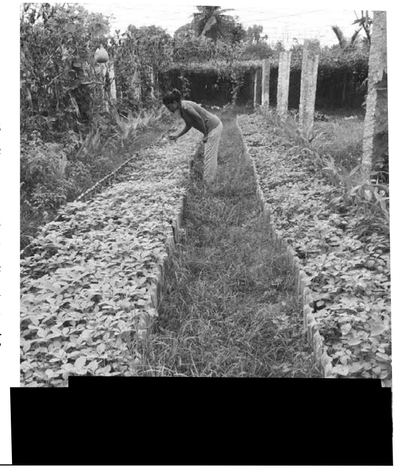
Suresh Kumar: “Space is never an issue, any space is suitable for growing a garden”

A telltale of Sarajpura Curries and associated art space SARLA

DEEPANJALI NAIK

For the past decade, Bangalore artist Suresh Kumar G has been committed to the art of growing food and reviving recipes that his community has long forgotten in the fast-growing capital city of Karnataka. After focusing on large-scale installations and site-specific sculptural works that addressed social and environmental issues within his community, the artist began to imagine a community that would be nurtured through a nearby farm. There would be constant sharing between the farm and the community, for example household waste recycled as compost, vermicompost, and various types of natural pest repellent, while these same households would eat the vegetables and herbs grown on the farm. It was his vision to encourage healthy eating at a reasonable price, without the costly “organic” label.

Nurturing this vision, Suresh Kumar also likes to add Samuha (“community/group”) to his name, as a testament to his passion for community. Food is at the center of any community’s well-being, and Suresh has always fiercely guarded this idea from other lucrative business opportunities to package anything remotely organic into a premium “organic” product.



Volunteer Deepa Reddy attending to the greens in the raised beds at Sarjapura Curries

The backstory of Sarjapura Curries


Raised beds in attractive shapes at Sarjapura Curries Farm

"Space is never an issue, any space is suitable for growing a garden," says Suresh, basking in the sun in his garden. He has collected used trays, drums, and fabricated structures to transform his home terrace into a green haven - unlike most other private patios in big cities, which remain unused. Suresh's terrace is where it all started, where the artist practiced making sculptures and designed spaces to grow plants, including edible weeds, forgotten vegetables, indigenous flowers that repel pests, and animals that nurture the soil.

Sarjapura Curries emerged when Suresh Kumar transitioned from his home terrace to initiating a community garden at the village community center where he had spent his childhood—a journey nurtured by passion. The pivotal moment was when the Bangalore Sustainability Forum granted Suresh a year-long grant. With this support, he began gathering seeds of lesser-known plants and weeds, cultivating them meticulously on well-organized growing beds.

It was an eye-opener to his kith and kin, who had never attached much value to the weeds, as they were unaware that the village landscape on which the weeds grew was going through a drastic change. These wildly available weeds would soon go extinct at a time when farms were being replaced with townships and high-rise apartments; these weeds had no future, and the recipes attached to these edible weeds were almost lost. Growing them in a kitchen garden was the only way to keep them in the local diet. Suresh organized meet-ups and giveaways to inspire more and more villagers to grow these lost vegetables and cook them.

As the community garden became increasingly popular and successful, Suresh's cousin Satish invited him to grow the same edible plants in a bigger space in the neighboring village of Hosahalli (meaning "new village"). This paved the way for Sarjapura Curries Farm: an old practice in a new village. Now Sarjapura Curries had a permanent home base. Hosahalli was already known for growing the largest quantity of vegetables in the taluk of Anekal, approximately 30 kilometers southwest of central Bangalore. Truckloads of vegetables are sent to the market every day. This was a place for healthy competition and teaching farmers to adapt to organic farming. Suresh shared seeds for free with everyone who came to the farm. It was mostly village women and city-dwellers who took the seeds home for personal gardening. When Suresh suggested growing organic to neighboring farmers, they were skeptical about the customer base for organic produce. They were used to using chemical sprays to destroy all growth in the soil, calling it weeds, and exposing the bare soil. This is not how it is done, Kumar told them: "Soil is a living being just like your pet, a dog, a cat, or a cow. You cannot strip all life from it and expect to get the yield of selected crops." The first formative years of farming must be spent on growing soil, regenerating the soil, and then there will be yield.

All Soil is Sacred

Gradually, Suresh scaled up his organic vegetable garden to an integrated farm with ducks, chickens, rabbits, goats, cows, and dogs. Some of the animals had been abandoned or donated by other farmers. Everyone found shelter at Sarjapura Curries, as the farm was focused not just on monetary profit, but on holistic benefits to animals on the land. Land is as fertile as the number of animals stomping the earth on the farm. At one point, even a mare (female horse) found a home at Sarjapura Curries, which made the farm more interesting to people who had a liking for horses! All in all, the farm kept sparking interest in all types of people for its unique and wholesome vision.

Mr Nagaraj, a retired school teacher who had been following the farm's activities, invited Suresh to replicate the model on his own land. The new farm is located next to Satish's farmland in the same village of Hosahalli.

This land came with a small hut where one could rest and cook meals, with space left for Suresh to design and develop. He designated an open kitchen to demonstrate recipes, a nursery, a storeroom for the harvest and seeds, and a dedicated space for birds and other animals. Raju, Manisha, Bhadhur and Shamala were the full-time caretakers of the farm, with a proper schedule for harvest and delivery.

After visiting the farm and documenting their process, online platforms such as Farmizen started placing bulk orders for fresh veggies and greens from Sarjapura Curries. Suresh began collecting produce from other farmers who followed in his footsteps and supplied it to Farmizen along with his daily produce.

Nearby educational institutes brought their students for farm tours. The professional colleges Srishti Manipal Institute of Art, Design and Technology, IIHSc (Indian Institute of Human Sciences), and APU (Azim Premji University) supported workshops at Sarjapura Curries to expose their students to organic farming. This gave way to more workshops, farm walks, and projects around farming and sustainable living. APU has since introduced a whole new course on farming in collaboration with Sarjapura Curries.

Launching SARLA art space

During this time, a new facility opened up. After Suresh's good friend Lata vacated her house, he took over the rent for his new venture: Sarjapura Arts Residency at Lata's, also known as SARLA. Along with Nancy Popp, Seema Jain, and Advithi E, the budding art space launched as a workspace, artist residence, and art gallery. These days, SARLA organizes regular art exhibitions.

The Bengaluru art scene is mostly confined to the city center, where art galleries and colleges flourished before the Information Technologies boom. SARLA is a one-of-a-kind art center situated outside the conventional artist circle, where it is gaining traction in the not-so-arty suburbs.

Now SARLA has shifted its focus from artist residencies and exhibitions to neighborhood and community engagement, with new volunteers working passionately alongside Suresh Kumar. From an artist standpoint, SARLA is a sister concern of Sarjapura Curries. Artists have an additional leeway to use farm environments and natural materials to make art. The association of art and an organic farm space brings a unique advantage to artists, art lovers, and the community.

Deepanjali Naik is a Bangalore-based journalist who writes about alternative education, the environment and sustainability.

Soil, Sail and Soul

TIM BOYKETT

The intertwined roots of the contemporary sail cargo actions with permaculture is perhaps surprising and initially unclear. Why Soil and Sail? Looking closely, we see the ways that soil and sail can move our soul.

The contemporary Sail Freight movement has (re) emerged in the past 15 years to create experiments of clean transport as a way to deal with the ecological crises of dirty fossil fuels. While many of the practitioners come from nautical backgrounds, a significant number see their roots in movements such as permaculture, a design system that uses natural systems, horticulture, agriculture and systems theory to understand and to create systems that are more permanent than extractive systems might be. Permacircularity is an expression used to describe processes that use permaculture principles to design and create circular economies, where there is no such thing as waste, only resources accumulating in the wrong place[1].

Anthropocene is Trade Time

The first Soil Assembly was held in Kochi, India[2]. Archeological research shows that Kochi has long been the nexus of a trade network that traces its way back to the end of the last ice age. As the Australian Aboriginals drew back from their flooded coastal places, there was a trading network that spanned the African coast and Madagascar, the Red Sea, the Persian gulf, the Indonesian archipelago and the mainland of what is now China. Arguably, ocean trade and exchange is as old as the Holocene.


The Arka Kinari • www.arkakinari.org

The dawn of the issues that we face today, of planetary heating and disaster capitalism, can be dated to various developments. One is outlined by Lewis Mumford and Fabian Scheidler in their concept of the *megamachine*[3], systems of power that emerged with the invention and widespread use of the written word, money and metals. The subservience of individuals to these megamachines undermines the bioviability of the world and humanities' place in it.

Another is the advent of the Anthropocene, the proposed geological age shaped by humanity. The Anthropocene has many suggested starting dates, including the creation of agriculture (with the clear interweaving with the megamachine) or the sudden increase in the use of fossil fuels during the Industrial Revolution. If we take the Anthropocene to be delimited by the layer of radionuclides deposited by various nuclear weapons explosions, then this is also the time of the invention of the shipping container, the intermodal box that has accelerated freight globally.

This is not to claim that exploitative production and economic relations need such energy intensities as fossil or nuclear fuels. The collection of practices that maximise material, energy and work yield from the earth, animals, crops and people is called extractivism. Extractivism can be seen without fossil fuel support in the actions of the various empires that scoured their landscapes by removing wood for shipbuilding, turning their wooded mountains into barren karst landscapes. These processes denuded the land, and the soil was lost, a feature of much of Europe.

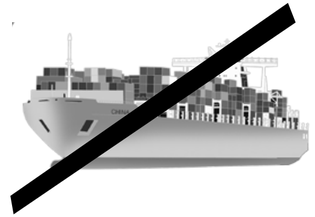
A Soil Assembly might be the place where lost soils come together to share their experiences and fight for a return to their homelands. We imagine a Soil Assembly where the shipbuilding of the past meets the desires for topsoil development in the present, looking toward a future where shipping does not denude landscapes or society, but is integrated into society as food could be.

Non-extractivist land care and agricultural practices were apparently not widely known in the West, with the European tradition being one of slash and burn, then move to a new village site while the forest regenerated. Europeans took this practice to their settlements in America, turning the clear flowing fish-filled rivers into muddy runoffs until drought and topsoil loss became a problem. In response, Franklin H. King did a study tour of Japan, Korea and China and documented ideas of sustainable agricultural practice, influencing the contemporary permaculture and regenerative agriculture movement[4].

Permaculture derives its name from the ideas of a permanent culture, one that does not deplete its material basis. Agriculture is part of this, but the culture, the soul of a group of people, is paramount. Culture can be seen as what we do when we don't have to do something, the things that make us human such as play, food as more than fuel, or Maslow's higher levels.

The Sail Freight movement is a loose alliance of organisations developing possibilities for moving materials across water using sails rather than motors. From small endeavours to shipping giants, from radical activists making the impossible happen to cool-headed rational business managers, there are a multitude of actions afoot, many coming together under the aegis of the *International Windship Association*[5].

While a large proportion of sail cargo projects target the European luxury market realm with organic cacao beans, coffees, rums and tequilas, some are more localised and mundane. The *Vermont Sail Project* was driven by a farmer, Erik Andrus, acting on behalf of



his local community for the clean transport of their wares down the Hudson River toward New York City. This informed and inspired the *Apollonia* project, which has been running freight of grain, malt and beer along the Hudson River since 2020.

Soil Sail Scenarios

If we think about the convergence of small windships and bioregional projects such as Suresh Kumar's *Sarjapura Curries* (read the dedicated article in this newspaper, editor's note), we can imagine futures where networks of small farms grow local, seasonal crops and exchange certain crops and resources through networks of small vessels. Steve Woods at the Hudson Maritime Museum has investigated shipping resources needed to supply various U.S. cities; there is reason to support the idea that medium-sized schooner-style vessels are the right size, the appropriate technology, for such a scenario. A number of regions around the Indian Ocean have distinct production profiles, from the large open spaces of northwestern Australia, the rich islands of the Malaysia-Singapore-Indonesia-Papua New Guinea archipelago, the Himalayan watered lands of the subcontinent, the arid dunes of the Middle East, the eastern coast of Africa down to the richness of Madagascar.

With a Sarjapura-style focus on regionalism, the effects of sail-linked bioregions would be strongly felt, and the benefits of trade and exchange across these bioregions would be beneficial to all. Ricardo's classic economic analysis of trade indicates that specialisation is better for all; however, this analysis ignores the transaction costs of transport as well as the risks of fragility in response to instability, both forces that suggest that developing and strengthening self-reliance at a regional level is a good thing. It also ignores the cultural specificity of certain textiles, for example. Nevertheless, supporting trade of valuable resources, local specialities and other goods has a lot to offer on a quality-of-life level. The creation of peer-structured exchange networks is a fundamental challenge here. If trading partners are not peers, but experience power-over, then a fair trade is unlikely, as explored in *The Nutmeg's Curse* (read the interview with Amitav Ghosh, author of *The Nutmeg's Curse*, in this newspaper, editor's note). How can we ensure that the errors of colonial behaviours are not replicated in the creation of new networks? It is vital that we learn from feminist, post-colonial and other economic reflections and analyses in order to coherently imagine and initiate these emerging and future scenarios.

Trans-BioregionalNetworks

The case can be made that shipping foods only makes sense across different bioregions. Bioregions are defined by the intersections of rainfall, temperatures, winds, soil types, landforms and other aspects of biogeography. Similar bioregions or climate analogues allow us to grow similar foodstuffs, such as olives around the Mediterranean and in southern Australia. The human structures and social environment in similar bioregions are often similar. Between Scotland and Norway there is little difference in what grows, so there is limited need for transport of locally grown food. However, the movement of foodstuffs between the UK and Portugal, a comparable distance, is useful because they are situated in distinct bioregions. As a result, the exchange is beneficial to both parties, bringing something that is difficult to produce in one region from another. This contradicts, to some degree, the ideas of Ricardo and the theory of comparative advantage, which underscore the benefits of trade in spite of local absolute advantages.

These networks connecting different bioregions cannot help but remind us of the Soil Food Web, as discussed by Elaine Ingham[6] and others. Early agricultural science treated the ground as a dead substrate with more or less accessible nutrients. Soil = Dirt + NPK Fertilisers (nitrogen, phosphorus and potassium). This is the core metaphor of what is known as the Green Revolution, which should perhaps be better known as the brown revolution of fossil fuel-powered industrial agriculture. This revolution turned farming into industrial infrastructure. In the intervening decades, our understanding of soil as an ecosystem has grown beyond roots through to fungi, bacteria, nematodes and a wide variety of other life forms, each of which plays a role in the recursive flows of nutrients and energy. Each organism in the network gives and receives material that is transformed but never becomes waste.

Regenerative food producers accept the role of "nature" as a part of their soil and support, not as invisible infrastructure, but as a visible part of the process. This is distinct from a worldview where nature refers to a certain type of infrastructure, the stuff that we want to have "over there" and not worry about except when we want to have a walk in the woods. As Timothy Morton keeps reminding us, this treatment of nature is perhaps the problem; nature, like infrastructure, is part of us and we are part of it. In natural ecosystems there is no waste, every "output" of an element of the system is used by another part of the system. Contemporary developments are using this insight for industrial processes to create a circular economy, one model of which is permacircularity. Like healthy soil, permacircular systems support mutual exchange.

Technological innovation and collapse	Approach to social, economic, environmental and political considerations: Holistic	Approach to social, economic, environmental and political considerations: Segmented
Optimist	**Reformist Circular Society** • *Assumptions:* reformed capitalism is compatible with sustainability and socio-technical innovations can enable eco-economic decoupling . • *Goal:* economic prosperity and human well-being within the biophysical boundaries of the earth. • *Means:* technological breakthroughs and social innovations that benefit humanity and natural ecosystems.	**Technocentric Circular Economy** • *Assumptions:* capitalism is compatible with sustainability and technological innovation can enable eco-economic decoupling to prevent ecological collapse. • *Goal:* sustainable human progress and prosperity without negative environmental externalities. • *Means:* economic innovations, new business models and unprecedented breakthroughs in CE technologies.
Sceptical	**Transformational Circular Society** • *Assumptions:* capitalism is incompatible with sustainability and socio-technical innovation cannot bring absolute eco-economic decoupling to prevent collapse • *Goal:* a world of conviviality and frugal abundance for all, while fairly distributing the biophysical resources of the earth. • *Means:* complete reconfiguration of the current socio-political system and a shift away from productivist and anthropocentric worldviews.	**Fortress Circular Economy** • *Assumptions:* there is no alternative to capitalism and socio-technical innovation cannot bring absolute eco-economic decoupling to prevent collapse . • *Goal:* maintain geostrategic resource security in global conditions where widespread resource scarcity and human overpopulation cannot provide for all. • *Means:* innovative technologies and business models combined with rationalized resource use and strict migration and population controls.

The framework of *Permacircularity* was developed by Christian Arnsperger and Dominique Bourg around 2014, applying the permaculture principles of a permanent culture to the design and analysis of circular economies. In a wide-view analysis of circular economy models and practices, Martin Calisto Friant and colleagues have analysed using various perspectives. One is the 2x2 array below. One axis of the analysis looks at the social, economic, ecological and political considerations, aligning them between holistic perspectives and more segmented or individualistic practices. The orthogonal axis deals with the faith that each discourse exhibits in technological solutions. One end is a solutionist approach that technologies can solve our main problems, as opposed to a more conservative or even techno-skeptical attitude. Arguably, permacircularity lies in the lower left quadrant of the diagram, but with a flexibility to move towards the upper left quadrant. It is clear that the two right-hand quadrants encourage antagonistic and selfish approaches that are unlikely to get us out of the current predicament, ignoring Deep Adaptation learnings, ecosystem thinking and interdependency. We claim that a suitable approach is to act as if the lower left quadrant is the way to go, using technologies that we know we can employ to benefit the whole of humanity. Such Transformation Society models are the conservative approach to a future for us all. We shall keep at least one eye on the upper left quadrant, the Reformist Circular Society, which allows for technological developments that could break us out into a less frugal model. This resonates with Christiaan de Beukelaer's book *Trade Winds* (Manchester UP, 2023), in which the author discusses which tack to take into the future, an ecomodernist or degrowth mindset.

With limited capacity, the main sail freight companies focus on high-value density goods. Rums, whiskies, wines, cacao beans, coffee; the list of goods reads much like the freight list of an 18th century sailing ship returning to Europe at the end of the run that took textiles to Africa, slaves to the Americas – and brought back commodities for European consumers to create the profits that built Europe. With the lack of peer structures, there is nothing that cacao farmers in the Caribbean would want to import from Europe in order to have a balanced trade. Perhaps this imbalance indicates extractive processes? A permacircular network needs exchanges at all interfaces, without the classic economist's lie that everything can be equated with a sum of money.

Another framework is possible. The Apollonia transports grain, malt and beer along the Hudson. These are not luxury goods, although they are probably not the cheapest and most commoditised versions of these goods that are being transported. The *Apollonia* calculates shipping costs by replicating the costs of shipping by truck. There is no extra charge for clean delivery. The Apollonia is still having trouble filling its hold for the return leg from New York City up the Hudson river, but this is changing. As other ocean-going ships bring produce to New York City from other bioregions, there will be more products to ship upriver. There might be the beginnings of a peer-to-peer trade network emerging.

Sail Cargo aligns itself with the "small and slow solutions" permaculture principle. Rather than trying to abstract away from the processes of transport and logistics, sail cargo stays with the trouble of loading and storing individual packets rather than anonymised containers; crews operating rather than administrators optimising; hands-on applied knowledge rather than hands-off applications of theory.

Stories of Possible Futures: Be careful what you ask for

Stories, or more generally narratives, can help us understand complex systems. Actors want things. Ecosystems of the soil and forest are often allied closely with human ecosystems; desires not only of individual animals but also populations, varieties and species are used to explain change. These ecosystem explanations are narratives, whether using the words of volition and desire of humans, animals or ecosystems, or the urges of protons and electrons, even if these do not fall into the structure of what we might more commonly refer to as stories. There are few mono-causal explanations; narratives have explanatory power that exceeds that of stories or rational analysis. All the forms of narrative, from story to system, are useful in understanding what can and should happen, narratives are the core of futures thinking.

The sail cargo movement is prefiguring possible futures. One of the questions when we imagine these futures is: What happens when this is successful? One of the selling points of sail cargo has been the narrative: this rum was sailed across the ocean; this beer was sailed down the Hudson; I bought this oil from a sailor in the harbour. As Sail Freight becomes commoditised and less newsworthy, will it continue to hold value and novelty? While the first slew of sail cargo vessels were all traditionally rigged and run by a large crew actively pulling ropes to the tune of sea shanties, vessels such as the Grain de Sail are modern vessels, easy to run, with small professional crews and palletised cargo. The emerging larger projects, such as TOWT's *Anemos*, begin to turn sail freight back into infrastructure: regular sailings, commercial rates, frictionless processes.

Will these larger projects become another part of the network that includes places like Suresh Kumar's small art farm, a bottom-up, small-farm future fragment? Or do they become part of the megamachine, of infrastructure? There is a dilemma here, as the creation of infrastructure makes life simpler and enables many to specialise and become cultural producers and researchers, but also extractive entrepreneurs. How will we, as creators of culture, continue to deal with these questions?

Permacircularity asks: Can we get away from growth and capitalism without going back to the Stone Age, or feudal peasant lives? How do we maintain insulin and vaccinations, Wikipedia and gender fluidity whilst avoiding plastic pollution, climate change and ecosystem collapse?

Sail Cargo is an ongoing laboratory, undertaking anticipatory experiments as to how and why we might continue to trade and exchange as we move into a transformed future. We have explored some of the entangled roots in permaculture and complexity-accepting interpretations of trade, as well as trade's role as a cultural connector across bioregions. Even the cultural trading vessel Arka Kinari8 operates as an exchange vessel across regions; these ongoing experiments are valuable and worth following, slow and imprecise as they might be. Only with such experiments can we better understand and maintain the cultural exchange necessary for us to navigate this critical zone; both in space and in time.

Tim Boykett is an inter-, trans- and undisciplinary researcher on possible, preferable and parenthetic futures. He has been co-hosting the Time's Up association (times up.org) in the port of Linz since 1996.

(1) The expression was coined in 2017 by Christian Arnsperger and Dominique Bourg from the University of Lausanne in Switzerland.

(2) See https://soilassembly.net

(3) Lewis Mumford, The Myth of the Machine I & II. Harcourt Brace Jovanovich, 1966 & 1970; and Fabian Scheilder, The End of the Megamachine: A Brief History of a Failing Civilization, Zero Books, 2020.

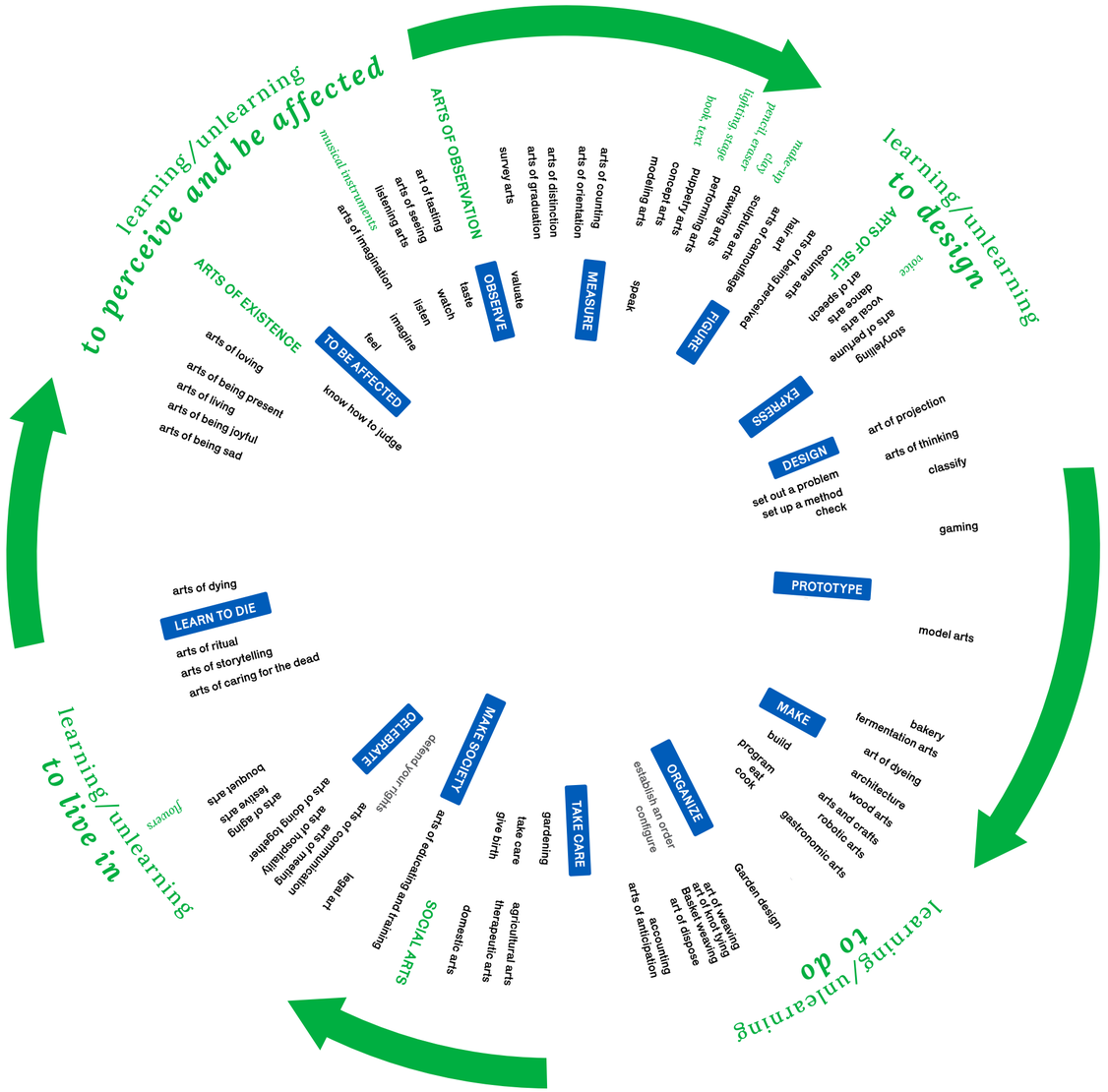
(4) Franklin Hiram King, Farmers of Forty Centuries; Or, Permanent Agriculture in China, Korea, and Japan, Madison, Wis.: Mrs. F. H. King. p. 441. 246 illustrations, introduction by Dr. L. H. Bailey; republished by Dover Publications, 2004.

(5) https://www.wind-ship.org

(6) https://www.soilfoodweb.com

(7) https://feraltrade.org

(8) https://www.arkakinari.org



Rethinking the Arts and How to Teach Them in the 21st Century

LEONORE BONACCINI

We look at the collapse of art in this world, with its various facilities, art galleries, white cubes, global middle-class artists and all those contemporary art metropolises located in the epicenters of extraction and consumption. We then ask: What happens to the arts and their teaching once this system declines? We imagine arts that have continued their history on the periphery of art produced by the state and the market, forming other currents of artistic modernity, which represent other ways of making art, teaching it, transferring it and using it.

We know that many living beings - insects, birds, mammals - exercise their artistic faculty in the most diverse areas of their existence, and without always having an instrumental purpose. These touching and powerful artistic expressions don't need showrooms to exist, any more than the art of loving needs to be filmed to exist as art. The power of art is widespread, throughout the human population and, beyond it, to other beings.

What is the purpose of this widespread faculty of art? It gives meaning to existence, it teaches us to live well or to relearn how to live with dignity, to prepare ourselves for life, in its most diverse and prosaic significations. But can this faculty be taught?

Modernism has made autonomy one of the founding doctrines of esthetics. In the emerging arts, autonomy and beauty are paradoxically expressed through subsistence, that is, in the art of inhabiting reality, in the ability to give meaning to the formative activities of everyday existence.

According to William Morris, art is designed to build and furnish living spaces. In the 19th century, it was the art of a society in which "men lived as men"[1], and today it is the art of a society in which "women, through the work of subsistence by ensuring autonomy, act directly on living together and the good life"[2].

Arts of subsistence as arts of living

What arts should be taught in the 21st century? One approach is to take the arts of subsistence as a starting point. These arts require us to move away from "the modernist ideology which, by classifying in the same group servile work, peasant work and the domestic work of modern housewives, is based on contempt for the natural processes of life"[3]. They also require us to move away from the easy and false opposition between cities (supposed to be places of culture), and the countryside (supposed to be archaic, and culturally null).

The arts of subsistence, today as in the past, are exemplary expressions of the arts of living. Philosopher Jacques Rancière evokes John Ruskin, who substitutes Kant's esthetics with a dual function: habitation, which presupposes a link between a way of producing and a way of consuming, and the free expression of the imagination, which narrates and signifies a common way of inhabiting the world[4]. This link between a way of producing and a way of consuming, which gives way to symbolic and imaginary production, is what characterizes the arts of subsistence.

These arts call for the spiritual unity of functions and needs. The objects in use must be best adapted to practical needs, while using symbols to establish a common way of inhabiting the world. The arts of subsistence, as a social art, are not just a skillful arrangement of functions. They also establish a style, which Peter Behrens, a member of the Werkbund, the founding movement of industrial design in Germany, paradoxically defines as "the symbol of a common feeling"[5]. This common feeling, which is so lacking today, is manifests in an art of judgment and esteem.

Arts of esteem and arts of inventing possibilities

The art of esteem individualizes a "common feeling" specific to each environment. Each environment, each human context, is specific and commands its own art of judgment, its own art of esteem. Alexander Chayanov uses the term "art of the farm" in his book *Social Agronomy*[6] to describe this art of esteem, the ability to coordinate or skillfully pair interacting equilibria. Chayanov's art of the farm, which coordinates and shapes unstable, dynamic equilibria, is a kind of social art that requires tactical and strategic skills, a diplomatic art of establishing compromises between simultaneous needs that cannot all be met.

The definition of this social art differs from its definition in the late 19th century, which advocated revolution through art and access to culture for the masses. Here, social art is the art of building and designing habitable spaces. It is also an art of experiencing a reality that does not exist, an art that invents possibility where it no longer exists.

This instantiation is commonly practiced in art and design, bringing objects, ideas and images into being, depicting beings, creating narratives that instantiate realities that don't exist. This possibility is inscribed at the heart of reality. Realizing this requires a new form of sur-realism. This renewed sur-realism is based on close observation of our surroundings, of all those beings and things with which, together, we weave the fabric of social reality.

This surrealism of observation demonstrates the ability of the artistic act to metamorphose, regenerate, rescue or transfigure a fallen or alienated reality: it's an experience based on what Tim Ingold calls unlearning and unmaking[7]. Unmaking is based on immersion in a situation, on the student's ability to empathize, to listen, to be "with". It forms the basis of the arts of the future.

Unmaking requires us to unlearn what we know, the clichés that prevent us from seeing, from observing and learning through experience."[8]

Léonore Bonaccini is an artist, teacher and researcher, she's a member of the Bureau d'études collective and co-founder of The Laboratory Planet.

(1) Ruskin in Rancière, Jacques, *Aesthesis. Scènes du régime esthétique de l'art*. Éditions Galilée, 2011:163

(2) Pruvost Geneviève, *Quotidien politique*, Éd La découverte, 2022 : 330

(3) Mies Maria et Bennholdt Veronika, *La subsistance, une perspective ecoféministe*, Éditions La lenteur, 2022, p. 11

(4) Rancière, op. cit., p.168

(5) Cité dans Rancière, op. cit., p. 179

(6) Chayanov Alexander, *The Theory of Peasant Economy*. (D. Thorner et al., editors.) Manchester University Press, 1966

(7) Tim Ingold, *private interview*, Aberdeen, March 2020.

(8) Ingold, Tim, *Faire anthropologie, archéologie, art et architecture*, Éd Dehors, 2017, p.62.

A *Territory-School in Bourbonnais*

BUREAU D'ÉTUDES

In March 2020, the French Minister of Agriculture and Food, Didier Guillaume, launched "an appeal to the shadow army of men and women" who "are no longer active" due to the coronavirus crisis, "to join the great army of French agriculture", in search of human labor. "Today," he explained to French 24-hour news channels1, "there is the possibility of 200,000 direct jobs in agriculture," which is deprived of the labor, particularly foreign labor, that it usually employs for field work. Like other European countries, France is facing a serious shortfall in the renewal of its farming population. However, this message does not seem to have mobilized a large segment of the population...

Perhaps this is due to the image of the harshness of the farming profession. Even at the end of the 18th century, pro- and anti-slavery intellectuals such as David Ramsay and Alexander Garden were quick to point out that the market gardeners and farm workers of England and Italy, the free peasants of France, not to mention the serfs of Russia and Eastern Europe, worked longer and harder than the Black slaves and White servants of Virginia in the United States... If farming is such a tough profession, how can we encourage people to consider it? And how can we give new meaning to rurality, the agricultural landscape that has been relegated to the sidelines of a global future often promised to urbanity? And if we have to promote agriculture, which one are we talking about? If agriculture is one of the great planetary laboratories, modifying geochemical cycles and shaping the Earth's landscapes, what kind of agriculture do we want for the 21st century?

Leaving behind the mirages of an industrialist conception of agriculture, and not believing in effortless access to photosynthesis, we focus here on peasant agriculture, a major and massive contributor to a habitable planet and the great diversity of its landscapes. Outdated agriculture? No. This resilient agriculture, which generates a common health, also establishes a soil fertility largely destroyed by industrial agriculture. Futuristic, it still involves billions of farmers around the world, who today work by hand or with animals. It is the benchmark for reclaiming the countryside of the Bourbonnais[2] bocage (hedged farmland), which has been on the verge of desertification for the past century.

Reintroducing peasantry to the Bourbonnais bocage[1]: organizing the settlement of immigrant peasants

In France, after the Second World War, a new, modern form of agriculture took hold, based on the management of agri-food supply chains being dispossessed from producers in favor of distributors. This profoundly altered agriculture and, consequently, landscapes too. Producers, losing their autonomy and specializing their offerings, were forced to acquire most production inputs (raw materials, technologies, animal feed, seeds, pesticides, fertilizers, genetics, oil) on the world market, and to sell their agricultural products there in return.

Today, rural areas in much of the European Union struggle with a declining and aging population, low labor availability, and a low and decreasing percentage of young farmers[3]. The abandonment of agriculture and land has resulted in the degradation of natural resources, loss of ecological and cultural biodiversity, and increasing regional disparities. The need for low-cost labor and the non-renewal of farmers have led to the use of migrant labor, which has gradually replaced family labor in various European countries.

In Greece, large populations of Albanians have come to live and work in the mountainous villages of northern Epirus, contributing significantly to restructuring the extensive livestock sector. In the north-eastern Pyrenees, immigrants from Morocco and Romania, Bulgaria, Ukraine, sub-Saharan Africa and Latin America make up around half of the salaried shepherd workforce. In Italy's Abruzzo region, a region with an important pastoral tradition, official data indicate that nine out of ten salaried shepherds are Macedonian or Romanian. Trends in Portugal and France are similar. Other agricultural sub-sectors show similar dynamics. For example, workers from Eastern Europe and the Balkans account for around 40% of the forestry workforce in central Italy, and in many cases they make a crucial contribution to maintaining traditional local forestry systems. In Italy, the salaried workforce in the livestock sector is largely made up of immigrants, due to the difficulty of recruiting local people. Punjabi Indians have come to dominate the dairy industry in northern Italy, keeping the Parmesan cheese industry running. The situation in France is no different.

This is about more than just temporarily mobilizing an immigrant reserve army. If no new French farmers settle here, the landscapes and farming know-how can be maintained by bringing in farmers from other parts of Europe, Africa or Asia. No doubt such a vision doesn't get good press, given that a certain French racism opposes the civilizing colonization of Europe in recent centuries to the colonization of de-civilization by non-French or non-European populations, supposedly disfiguring the ethnic substratum of France or Europe. But if agriculture has long served as an emblem of nationalism and state racism, it is now one of the crucibles of 21st-century post-national society.

Reintroducing peasantry to the Bourbonnais bocage[2]: establishing the territory-schools of the Anthropocene

Pleaching is a technique of interweaving living and dead branches through a hedge creating a fence, hedge or lattices.
Garance Rouvet, *L'Allier déjà en transition*, 2021, image source: AFAF

The "bocage" is no longer quite a peasant landscape, if by this term we mean a landscape oriented exclusively toward subsistence. It is also a manufactured landscape. In fact, this landscape is both a production organization (producing meat for Paris, with a vertical social organization based on general farmers and sharecropping) and a subsistence organization. The landscape is therefore both peasant and proto-industrial. In the 17th-18th centuries, the Bourbonnais gradually became an area of extensive mixed cattle production. In the 19th and 20th centuries, it was France's leading tenant farming area, producing meat that was transported in vast convoys to feed Paris.

Aerial view of the Bourbonnais bocage, Garance Rouvet, L'Allier déjà en transition, 2021, image source: AFAF

Unlike the peasant economy as described by Chayanov or Van der Ploeg[4], bocage agriculture is not only oriented toward local markets, but also toward cities. This situation is exemplary in that it combines subsistence farming, and transforming the landscape into a workshop, a technical environment, the development of fertility, i.e. the targeted intensification of the species and microbial substrate that constitute it, and an increase in cattle production.

In the Bourbonnais region, forks and other tools, beams and heating fuel, and even foodstuffs are obtained from hedgerows. Added to this is the use of raw or baked clay for all objects, walls and roofs, completed by limestone walls baked in the limestone kilns that are still in use nearby. This modern dual landscape, combining subsistence and production, is still there, very close to us. There's still time to reactivate it. Isn't this the dream landscape of territorialists who predict a hundred years or so to reactivate this dynamic of reterritorialization based on urban bioregions that combine a city and an agroforestry and market-gardening countryside on the outskirts of cities?

This is no nostalgic reverie. It's a pressing need at a time when arable soil is disappearing everywhere[5], when soil erosion is "as big a threat as global warming"[6], and when it's still possible, here in the Bourbonnais, to maintain those centimeters of fertile soil that took hundreds, even thousands of years to form[7]. Soil is an artifact: it doesn't maintain itself. It marks the coexistence and collaboration of numerous species in a common socio-ecological order[8]. In the Bourbonnais region, landscapes are once again in need of upkeep and maintenance if they are to survive. This maintenance requires the presence of animals for both manuring and tilling the soil. In fact, it's impossible to talk about farming in the bocage without talking about our relationship with animals – it's this coupling of human and animal that has created the landscape and made its soil fertile.

A territory-school is a way of preserving a memory of the landscape, the technical culture and subsistence practices associated with it, of relearning how to create a landscape with what we depend on. In the Bourbonnais bocage, we have established a territory-school. This territory is still only an idea, in other words, not much. It involves setting up various tools to help maintain the landscape: land acquisition tools to get land out of the hands of speculators; schools to train or support the urban dwellers and migrants who are resettling in the deserted countryside, taking the place of locals who have gradually left the region over the last century. This also means developing local markets, alternative food networks and short-distance supply chains with municipal canteens and collective catering, as alternatives to mass production and large-scale organized distribution. One of their key features is their ability to re-socialize or re-spatialize food, enabling consumers to make value judgments about the relative desirability of foods.

Reintroducing peasantry to the Bourbonnais bocage[3]: a problem of energy resilience

The challenge of reintroducing peasantry to the Bourbonnais bocage is not only social, cultural and human. It involves not only rebuilding local markets and renewing the way we build culture and society among individuals and groups from different origins. It involves energy and health at the same time: a farmer is not simply a milk or meat producer. He is first and foremost a guardian of nature, a provider of multifunctional goods and socio-ecosystemic services, including common health.

The industrialization of agriculture has not only affected common health, by reducing biodiversity and introducing chemical, phytosanitary and veterinary inputs. It has also relied on fossil fuels. On one hand, it has favored transforming microbes into enemies, imposing unprecedented measures that have led to a radical depletion of microbial environments in food, and in milk in particular. On the other hand, while it has increased the productivity of cereals per hectare, it has reduced the energy efficiency of peasant farming by replacing draught animals with tractors. In Edo-period Japan, rice cultivation was 15 times more efficient than it is today, if we compare the human calories expended with the calorific equivalent of the quantity of inputs used now. Contemporary agriculture requires 2,300 kilocalories to produce a single kilogram of rice, with 50% burned by farm machinery and tools, to which must be added 25% for the production of phytosanitary products (pesticides and fertilizers)[9]. In the 19th century, the economist Sergei Podolinsky had already pointed out the difference in energy productivity between a natural prairie where human and animal labor are only marginally involved, and a wheat crop where they are increasingly involved: the amount of energy produced is far greater than the amount of animal and human labor that had to be incorporated into the soil to increase productivity[10]. The challenges of the 21st century demand that we profoundly reconsider our farming practices, and all that goes with them, in terms of energy, health, society, space, politics and economics. The peasant revival is also a revival of local democratic life, capable of deciding locally on its common health policy, as well as its food sovereignty.

Bureau d'études collective is an artist group living in a place cultivating a culture of the commons in Bocage bourbonnais (FR)

(1) Laurence Girard, "L'agriculture française cherche des bras et des débouchés", *Le Monde*, 24 mars 2020
(2) The Bourbonnais bocage is a territory that extends between Montluçon and Moulins in the Allier department in the French region of Auvergne-Rhône-Alpes. Its territorial footprint is more porous than that of the community of communes of the same name.
(3) Alexander Chayanov (1888-1937) was an agrarian economist, specialist in rural sociology and advocate of agrarianism and cooperatives. He took part in the Soviet revolution, supported cooperatives, but was skeptical about large-scale farming. An advocate of substantive agriculture, he published Organization of Peasant Farms in 1925, which led to his repression by the Stalinist regime. He was shot in 1937. He inspired Jan Douwe Van Der Ploeg's *Peasants and the Art of Farming. A Chayanovian Manifesto* (Fernwood Books Ltd, 2013).
(5) David Pimentel, eminent agricultural scientist, declared in 2006 that "30% of the planet's arable land has become unproductive, and much of it has been abandoned for agricultural use." Dans Pimentel, D. Soil Erosion: A Food and Environmental Threat. *Environ Dev Sustain* 8, 119–137 (2006).
(6) Radford, Tim, "Soil Erosion as Big a Problem as Global Warming, Say Scientists," *The Guardian*, February 14, 2004
(7) FAO, 2015
(8) Satoyama in Japan, terraced rice paddies in China and in the Philippines, cultivated forests in South Korea, mountain pastures in the Alps and Jura, agroforestry crops in southern Germany, agroforestry systems in Indonesia (dunsun) and along the Iberian peninsula (dehesa).
(9) Ishikawa Eisuke in Leila Chakroun, *En quête d'autres milieux. La permaculture au prisme de la mésologie en Suisse et au Japon*, Institut de géographie et durabilité, Faculté des géosciences et de l'environnement de l'Université de Lausanne, 2023, p. 414.
(10) Sergueï Podolinsky, Le Socialisme et l'unité des forces physique, *La revue socialiste*, n°8 du 20 juin 1880.

Helping migrant people to settle into agriculture and crafts in France

A4 *(ASSOCIATION FOR THE HOSTING OF AGRICULTURE AND CRAFTS ACTIVITIES)*

Behind the Association A4[1] is a group of people in a precarious situation - mainly because of our administrative status as "undocumented" or "exiled" - who want to live with dignity and work in the agricultural or craft sectors in France. Our collective includes former bakers, farmers, welders and various members of popular education associations already involved in agricultural and food issues.
This is a challenging project, which faces increasing polarization between urban centers and outlying areas, between cities and countrysides, between those with and those without working papers, as well as the rise of the extreme right. But it also faces the agricultural decline affecting rural areas and the announced expansion of agro-industry in Europe, in addition to climate upheavals.
In light of these shared observations and common difficulties, experienced by both French farmers and artisans and people who are struggling to obtain official legal status, we are endeavoring to build networks on an equal footing[2] based on mutual aid and mutual needs. We don't want charity. This is a fundamental condition for the project's success: that we are considered farmers and craftspeople in our own right, and not simply as "beneficiaries".
We stand at the intersection of immigration, anti-racism, peasant and environmental struggles. We are attempting to break down the barriers between militant worlds that, even when they share a common territory, never meet. Building a network doesn't mean supplanting what already exists, but rather strengthening the mesh of solidarity and mutual aid, as we stand in the crossfire of several political issues.

Origin: reconnecting intimately with the earth

In the spring of 2020, the pandemic lockdown reminded us just how fragile and vulnerable outlying districts of Paris such as Saint-Denis are. But it also provided fertile ground for weaving links between various activist movements, particularly focused on reflections around food, land, subsistence farming, professional training and agricultural work. Meetings at the Notre-Dame-des-Landes ZAD (*Zone À Défendre*) in 2021, part of the "Reprise de terres"[3] project, initiated the process of creating A4. The question immediately arose: under what conditions could we, people in exile, some of whom had no French papers, be trained and work in the countryside? In the city, many people with migratory backgrounds are forced to work in poorly-paid jobs: we are exploited - in construction, cleaning, security, cooking, etc. - so that we can support ourselves and our families back home. Beyond the question of work, there's also the problem of housing, which is rarely available in decent conditions.
In the countryside, a number of us have also had complicated experiences. It's often difficult to live there, because of social isolation and the constraints associated with travel and limited job opportunities. As in the city, the risks of exploitation exist in informal work situations, with the usual blackmail around papers, and threats by neighbors or employers of reporting us to the authorities in the event of conflict.
Some farmers find themselves in difficult situations: they face losing their vocation to work in farming/crafts, with fading institutional support and enormous administrative constraints, besides being heavily dependent on the market and banks. As a large number of farmers retire over the next decade, agro-industrial surfaces are already expanding.
We therefore feel it is essential to build a link between our experiences. We aim to open doors to the countryside, offering opportunities in crafts, agriculture and other fields. A4 aspires to be a bridge between urban and rural, to satisfy the need for rural settlements and to share skills.

Objectives: independence through training and work, against exploitation

A4's objective is to provide hosting, training and access to work for people with or without papers, whether they live in the city or the countryside. Ultimately, we want to make it easier for people to set up farming businesses, whether in France or elsewhere. To meet this objective, we are looking for farmers and craftspeople who are ready to host, employ or pass on their skills, as well as land to settle on, training and financing for our activities. Our association is founded on three pillars: training, remuneration and regularization.

Often, farmers who are enthusiastic about hosting us have small farms, which don't always generate enough income to establish an employment contract, at least on a full-time basis. This may mean thinking about setting up a business based on several activities, using employer groups, or other solutions that we are looking into to facilitate this mutual aid.
Several A4 members have worked on industrial farms in Andalusia and France, where we have experienced exploitation by the agro-industrial sector, a situation that is difficult to escape. This was also confirmed during our investigative trips to Brittany and Provence, where undocumented migrants are working on some of the biggest farms, performing repetitive tasks with no transmission or sharing of knowledge, and no rights. It's a constant fact: our administrative situations keep us in a state of exploitation, in undignified living conditions[4].

In the wake of these deplorable observations, we set about investigating[5] and denouncing this increasingly racist and slave-like reality[6], by studying investigative techniques and collecting testimonies from those who remain in these situations.
Furthermore, we have established a hosting protocol, to help us identify places where we would like to train, or even eventually settle down, and to agree, with the people who host/employ us, on our mutual commitments and various other points. Our goal is to be independent in our work relationships, to mitigate abuse and the risks of exploitation, and to build together with our hosts the conditions for our emancipation. Achieving these objectives presupposes an organization that gives everyone a place, on an equal footing, while leaving the initiative to those most concerned.

Results and challenges

Currently, there are 15 of us behind the A4 project, and around a hundred people involved in specific working groups and local groups. We are determined to move forward together, however heterogenous the group, whatever each person's level of understanding of French language or France's administrative reality. We're also studying and developing care tools – for everything that concerns the life of a collective, decision-making, militant and social action, but also to combat systemic oppression, and in particular racism and sexism, in order to rise above the integrated and systemic behaviors that we all have, and better take care of each other, respecting ourselves and others.

In three years, there have already been about 60 placements (cannery training, cooking internships, seasonal work, bakery internships, truck farming, construction work...), 15 professional introductions, a network of about a hundred possible host sites, 3,000 m² of loaned greenhouses in Lannion (growing peanuts, peppers, pineapples; building a bread oven and a henhouse...), five investigative trips, five local groups in Grenoble, Lannion, St Affrique, Ile-de-France and Anjou.

We still have a long way to go: structuring the association, creating a legal guide to help people find work and regularize their situation, improving our hosting protocol, consolidating local groups, responding to new requests and supporting new dynamics... And we are also dreaming of greater autonomy: by setting up our own collective farm(s) to offer training, ensuring a bit of our subsistence and enabling some of us to settle down.

(1) A4 website: http://www.a4asso.org

(2) See the film about our trip through the Limousin region of France in February 2022, D'égal à égal (41'39, subtitled in Fr, En, Es), here: https://vimeo.com/770515263

(3) Read a presentation of "Reprise de terres" in *Terrestres*, (https://www.terrestres.org/2021/07/29/reprise-de-terres-une-presentation/) or in *Socialter*, as guest editor of the issue "Ces terres qui se défendent": https://www.socialter.fr/auteur/reprise-de-terres

(4) A study that shows the detached working conditions in the south of France: "Travailleurs détachés - les dessous d'une exploitation", article and podcast on 18 April 2023 at https://www.blast-info.fr

(5) https://a4asso.org/enquete/

(6) Karl Laske, "Travailleurs saisonniers du Maghreb: la FNSEA lance son propre business", 29 February 2024, at https://www.mediapart.fr

Kerminy, a Space for Agriculture in Arts: Weathered Esthetics

MARINA PIROT & DOMINIQUE LEROY, (n)

Our artistic duo (n)[1] - Marina Pirot and Dominique Leroy - launched a "space for agriculture in arts" in 2020, in Kerminy, Cornouaille, Brittany, France. After experimenting artistically with sound and the soma[2] for two years (2018-2020) from our nomadic studio set up on an organic farming site on the outskirts of Nantes, our foray into fertile soil prompted us to found an experimental vegetable art farm, in order to pursue our esthetic investigations. Kerminy is an ancient 14th-century seigneury with a chapel, washhouse, outbuildings and woods, established on a 12.5-hectare estate that borders a large forest. The land adjoining the château is therefore free to use, and even to farm. So we wasted no time in anchoring our Cyclo-farm[3], a mobile agro-pasture vegetable and fruit micro-farm, created to run a self-sufficient food system by combining soft farming and art techniques.

In Kerminy, we become artist-peasants, cultivators of resilience and regenerative autonomy, on the path to techno-economic deslavement, decolonizing narratives, and empowering both artistic and agricultural means of production. Like art research, agriculture in arts defines its method by practicing eco-creation[4] and processes of situated agency. Kerminy is an agrarian experiential terrain, backed by a self-managed artists' residency (another (n) project: Open[5]), where we as sonomatic artists[6] and (n)'s regular artistic encounters[7] unfold.

(n)'s sound and somatic art become sonomatic

In one of the active greenhouses, a permanently installed listening device sonifies[8] weather data from the surrounding landscape using live transduction[9]. The greenhouse-laboratory-stage ("slabs") becomes a stage for listening and creates a work atmosphere for the practice of vegetable gardening. Vegetables, as well as artists and interns, work in the slabs to the sounds generated by the day's weather variables. The sound installation becomes an agricultural tool-instrument. Indeed, by growing vegetables in the greenhouse, we develop an acute sense of listening that al-

Salbsdanse
Somatic danced harvest, picking tomatoes, watermelons, eggplants, melons. August 2023

lows us to perceive variations from one day to the next. We can “listen” to a high level of humidity, or an extreme temperature, and deduce that we need to open the greenhouse, for example. The artwork-instrument gives us precise information and bathes us in an environment that we share with plants. Strangely enough, as we receive the same frequencies with our very different systems of perception, we feel a certain continuity with vegetable otherness!

The somatic arts[10] often practiced in the slabs of Kerminy engage the perceptive faculties of our bodies at work in the nourishing landscape. Our body-weather[11], like an antenna that both transmits and receives, develops the potential for interspecific relationships with plants and animals, partners in daily practices through focusing our attention on breathing, skin, body systems and fluids, which reveal both kinships and asymmetries. Each season, we offer groups of participants guided somatic gardening sessions for sowing, transplanting, weeding or picking[12], in the form of workshops or contributory performances. The gestures and postures of gardening become movements of joint attention between participants and with the vegetables, sometimes leading to collective choreographies, as during the Cap Danse festival in 2023. And we often leave with a basket of vegetables! A “Potato Show”, a harvest of potatoes in a social agriculture-sculpture[13], is in the works for next September, to the rhythm of the sounds of the moment.

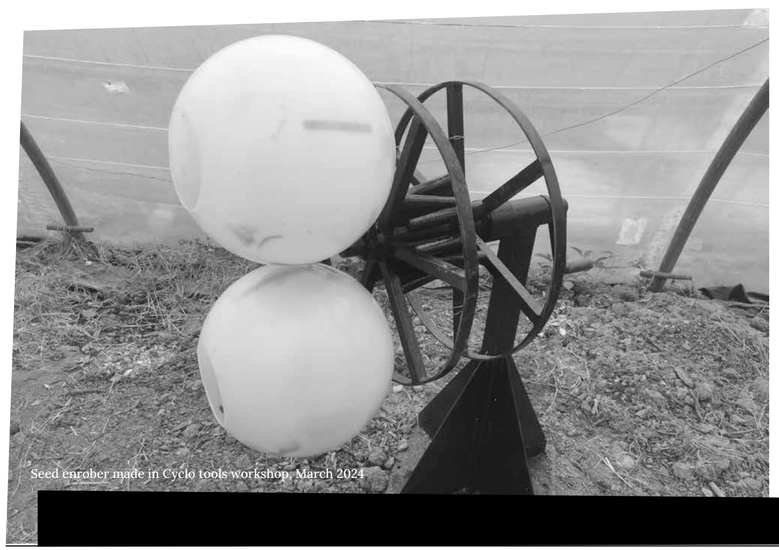
Our everyday art becomes sonomatic, as our internal and external listening practices cultivate passageways for interspecific exchange through these artistic devices within agricultural spaces.

Tool-instruments for art

Farming tools are a research by (n) called Cyclo-tools[14]. Our artistic approaches, modes of investigation and care for gleaned old tools, are conceived as an extension of the farmer-body, awakening gestural or technical memories. Tools that have emerged from pre-oil farming times are reshaped or augmented (with parts that are made in a workshop or 3D-printed, recycled PVC tubing, etc.), or simply reactivated by current gestures and materials, in a sort of solarpunk esthetic. The method involves hacking, or reappropriating manual techniques and know-how liberated from fossil fuels for a decarbonized technical future. For example, a hydraulic ram pump (made from PVC pipes and a fire extinguisher), pumps water up from the “fountain woods” to the greenhouses, using the energy of falling spring water. We used old streetlight bulbs to make a centrifuge for our experiments in clay-coating pre-sprouted seeds to sow directly on soil mulched with compost to avoid mechanical tillage.

Two donkeys, Cyclo-farm’s new partners, accompany the preparation of humus and the fertilization of crop beds, pulling sledges of forest leaves to the crop beds. By reinvesting tools and fine techniques, right down to collaborating with animals, we relive the experience of a pre-motomechanized period, which hints at new possible technological paths, in line with current ecological creative actions[15]. A new esthetic relationship born from technical reappropriation seems to engage us in new plant and animal relationships, in conditions that we are discovering are essential for nourished and nourishing soils.
Our duo (n) draws on Kerminy’s past temporal layers, while taking inspiration from futuristic solarpunk perspectives to activate creativities that combine art and agricultural scenes.

Kerminy’s concrete utopia also articulates “commons-singularities”[16], precisely because the site has become a breeding ground for plural emancipations, a test-space for long-term collective autonomies. It seems possible to reawaken the metamorphic power of an art that becomes less feral[17] than re-rooted, an art that rediscovers a soil. An art that promises us cultivated relationships, regenerating both our bodies and the living soil.



Seed enrober made in Cyclo tools workshop, March 2024

(1) n as nomadic in parenthesis in the sense of “nomadic thinking” (Deleuze) was born in 2015. The (n)omenclature is on n.kerminy.org.

(2) Somatics are practices of bodily perception that refine our relationships with our environments. Among the most well-known are the Alexander technique, the Feldenkrais method, and Body-Mind Centering.

(3) Cyclo-farm is (n)’s agricultural project: cyclo-farm.kerminy.org

(4) (n) has been developing eco-creative projects since its previous lives, including Ecos, an urban arts and ecology organization co-founded by Dominique Leroy in 2006. Eco-creation is defined by Sophie Gosselin in Revue & corrigée#75, 2008, p.35.

(5) The Ope(n) project (open.kerminy.org) was inspired by the Performing Arts Forum in Saint-Erme-Outre-et-Ramecourt (pa-f.net).

(6) At the intersection of sound art practiced by Dominique (dominiqueleroy.info) and somatic art développed by Marina (marinapirot.info), our practices become sonomatic.

(7) Such as the Polusol or Agrilab art events hosted by Couëts, followed by Pandorhack, Fluxon and Ecosoma in Kerminy (park.kerminy.org)

(8) Sonification refers to the representation and transmission of physical data in the form of acoustic signals. In the greenhouse, weather data such as humidity, temperature, UV index are captured and sonified in real time.

(9) Transduction refers to the conversion of electrical energy into sound vibration. The tubes or polythene membrane of the greenhouse, when vibrated, act as an amplifier.

(10) “Matières-art somatiques” is the program developed by Anne Expert, based on the principles of Body-Mind Centering®, which Marina has been following since 2020.

(11) To reference a notion of the Body Weather Laboratory, which Marina explored during a collective research (2018-2020).

(12) Sessions performed as “body scores” of somatic gardening.

(13) In the 1970s, the artist Joseph Beuys (1921-1986) developed the concept of “soziale plastik”, social sculpture, by which society as a whole must be considered as a total artwork (Gesamtkunstwerk) to which anyone could creatively contribute. This idea is summarized by the phrase borrowed from Novalis: “Every person [is] an artist.” We speak of social agriculture-sculpture to extend Beuys’s concept to our context.

(14) The tool-making workshop Cyclo-tools is inspired by the American slow tools (slowtools.org)

(15) We refer readers to François Jarrige’s La ronde des bêtes, le moteur animal et la fabrique de la modernité, La découverte, 2023.

(16) Antoine Freychet, Démarches artistiques et préoccupations écologiques, l’écoute dans l’écologie sonore, l’Harmattan, 2022, p.283.

(17) Feral in the sense of Charlotte Cosson: an art that “would return to wild life, (…) from ploughing to the teeming of life, from conventional agriculture to agro-forestry, from industry to artistic freedom” in Férale, Réensauvager l’art pour mieux cultiver la terre, Actes sud, 2023, p.67.

The School of Sourdough

MARIE PRESTON

Cécile and Jean-François Berthellot, Terroir #10, Mollac, April 2024, photo: Marie Preston

“The perspective of subsistence consists in viewing the world from below, from the perspective of everyday life […].”[1]

In France, bread has long been the staple of our diet. But since the end of the Second World War, our common bread has become progressively less nourishing. New techniques of intensive kneading by machines have resulted in industrial production standards, so that bread is white and airy to the point of becoming a standardized product stabilized by additives. Nonetheless, making bread is an iconic activity when it comes to subsistence. Studying the art of bread-making reveals the historical mechanisms of an instrumental relationship with the living, as we collectively imagine new practices to herald a “biofuturism” that is as alive, inhabited and singular as natural sourdoughs.

From a perspective combining feminism, ecology and economics, Maria Mies and Veronika Bennholdt first published The Subsistence Perspective, Beyond the Globalised Economy in Germany in 1997. One of the starting points of their book is the way capitalism exploits subsistence work and makes it invisible through the phenomenon of “housewifefization”: “This applies not only to ‘housewives’ in the narrow sense in the industrial countries but also to the work of the women who do home work, to Farm labourers, peasants, small traders, and Factory workers in the South.”[2] It’s important to be aware of those who are involved in making our daily lives, particularly in countries that sociologist Geneviève Pruvost calls “post-subsistances” – another way of saying “industrialized” to emphasize what has been lost[3]. Among them, many bakers are growing peasant wheat, reviving the practices of subsistence societies.

When the ecologist and microbiologist Delphine Sicard offered to analyze my sourdough and wrote me that one gram of this bread contained 660 million bacterial cells and 57 million yeast cells, even though I knew that it contained numerous living things, I felt dizzy. To be the commensal of such a large microbial community[4]. We eat healthy, nourishing bread thanks to the action of a multitude. If sourdough sustains us, in order to maintain it, this attention must be mutual. Bakers who make bread with natural sourdough are also breeders of bacteria and yeast. Over the last 15 years, several research programs such as “Pays Blé”[5] and “Bakery”[6] have described how individual practices have cultivated and maintained the diversity of these micro-organisms. Every sourdough is different because the hands (and their microbiota) that refresh it are singular. To maintain this richness, our ways of doing and making must also cultivate diversity. This counter-model to the agri-food industry clearly shows that uniformization, standardization and homogeneity impoverish living things.

Since 2022, the “LEVAINS” participatory research program has involved farmer-bakers, craftspeople, scientists, animators, trainers and artists[7]. Sourdough is the school that makes our group learners-teachers in an attempt to understand it. Sourdough is a school because its household is the bakehouse in which we gather. To be clear, this household is “a place whose inhabitants are not necessarily related, nor exclusively human. Buildings, animals, plants, tools, spirits of the place are all members of the household”[8]. The aim of our research is to study the expanse of this household. Our question is “How do the environment and the history of the bakehouse influence the biodiversity of the sourdough and the typicality of the bread?” Before getting started, we met over a year, in 2022, to define this biodiversity together[9]. Do oak trees, smokehouses, cows, cars, the old fire, children, the gravel in the courtyard, sunlight and the song of nightingales have an impact on this biodiversity? What are the limits (or absence of limits) of this school of the outdoors, of the invisible, of micro-organisms, of taste, of mutual maintenance?

To answer these questions, one aspect of the program aims to define the notion of “baker’s land”. We try to respond with words and clay. Here, Cécile and Jean-François Berthellot have shaped their land. The hand is central, the heart of history and territory. It symbolizes the idea of sharing, communication and support. The hand chooses the wheat and the mill, accompanies the transformation of the elements. Between these fingers slip ears of wheat. Around them, they have shaped a river, the Lot and the Garonne, as well as the valleys of the clay-limestone hillsides. Although only one hand is symbolic here, their practice has always involved their four hands. Fifteen such lands have been formed, their descriptions recorded. Our current definition weaves between territory, relationship, attachment and tradition.

Marie Preston is an artist and lecturer at the University of Paris 8 Vincennes-Saint-Denis (TEAMeD / AIAC Laboratory).

(1) Maria Mies and Veronika Bennholdt, *The Subsistence Perspective, Beyond the Globalised Economy*, Zed Books, 1999.

(2) Ibid., p. 11.

(3) Geneviève Pruvost, *La subsistance au quotidien, Conter ce qui compte*, La Découverte, L’Horizon des possibles, 2024.

(4) See Line Gigot, Marie Preston and Graziella Semerciyan, Jouer l’alleu, 2021.

(5) https://www.triptoleme.org/publications/ [Viewed 9 May 2024]

(6) https://anr.fr/Projet-ANR-13-ALID-0005 [Viewed 9 May 2024]

(7) Both are associated with associations such as Triptoleme.org or biocivam 11 (bio-aude.com); research institutions: Institut national de recherche pour l’agriculture, l’alimentation et l’environnement (INRAE), Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), Arts des images et art contemporain research laboratory (AIAC, Université Paris 8); training centers: Centre de Formation des Apprentis des Compagnons du Devoir and École internationale de boulangerie.

(8) *Ibid.* note 3, p. 13-14.

(9) More information on LEVAINS, https://soundcloud.com/marie-preston-986852950/elever-un-levain [viewed 9 May 2024]

How Does Soil Prototype?

Notes from the Regenerative Energy Communities artistic research project in Växjö, Sweden

REGENERATIVE ENERGY COMMUNITIES

“Earth is not created by human hands—but human hands have forced themselves into the earth. And yet the earth does not allow itself to be owned” (Elin Wägner and Elisabeth Tamm 2021 [1940], authors’ own translation).

What can centering soil health entail for different fields and communities? What does it mean to ground (practically, critically, ecologically) creative engagements and experimentations, whatever these might be, within propositions aimed at not merely sustaining, but actively reviving and enhancing the health and resilience of local soil-supported ecosystems and their interdependent communities of materials, beings and relations? What commitments and closures would doing so entail? What are the pressures and possibilities of soil-centred thinking and practice?

Feral Circuits workshop making low-powered regenerative energy noise synthesizers at Nonagon festival in Svävö, Sweden. Photograph by Regenerative Energy Communities, 2023, CC4R

We share initial responses to these questions as they have arisen during the work in our Regenerative Energy Communities research project[1], where we have prototyped small-scale forms of sustainable energy provision inspired by the practices of local experimental farming communities in Växjö, Sweden. A core aim of the project has been to explore what possibilities lie in practices that aim to be regenerative. Inspired by both recent and longer-standing traditions around regenerative agriculture and agroecology more generally, the project situates its research across the overlapping fields of energy and agriculture, with a view to reimagining current approaches to the climate crisis, renewables and the so-called green transition.

Engaging as artists, designers, growers and technology geeks with energy and agriculture issues has involved implicit challenges. Among them is the ongoing question of how to collectively build regenerative imaginaries that support ties across soils and damage narratives of the smooth continuity of energy. To date, this has involved developing and experimenting with a range of different regenerative prototypes together with others. Looking back on various moments from the workshops, exhibitions and experiments during the project’s three-year span, we found it helpful to reflect on the question: “How does soil prototype …?” For us, this prompt has a cascading quality in how it unearths challenging follow-up questions. Questions such as: How does soil prototype communities? How does soil prototype (regenerative) imaginaries? Critiques of technology? Creative and sustainable uses of technology? Stories of damage, (overwhelming) refusal and unknowing? In the question’s ability to loiter and remake itself, it has a quality similar to how the anthropologist Kristina M. Lyons, writing in 2020 on human-soil relations in rural farming communities in Columbia, describes the ability of decomposing layers of composting piles (hojarasca) to “force thought” via the many different and vital “propositional life-making processes” that gather around and emerge out of them.

Prototyping with regenerative commitments

The project began from wanting to support a local university-adjacent farm site with a sustainable energy infrastructure during a time of increasing fossil fuel use, critical mineral extraction and the largely limited imaginaries of the current "energy crisis". The project is situated around a small-scale experimental communal farm. On this site, farming collectives such as the Feminist Farmers and The Dirt (themselves artists and designers), as well as local individuals and families, experiment with growing methods inspired by regenerative farming, permaculture and other forms of creative soil-based practices for sustainable and community-minded approaches through hands-on/feet-in contact with the earth.

Our proposal to work in ways that nurture soil-supported ecosystems draws on regenerative farming’s central commitment of actively improving soil health. This proposal gives not only a concrete and practical directive for ways of working, but also carries within it an implicit critique of approaches aimed merely at sustaining things as they are. This feels particularly necessary at a time of multiple destructive overlaps within practices of energy and agriculture, with their modes of extraction, capitalist expansion over land and ongoing depletion of ecological health. With such interlinked questions in mind, our project explores how current energy metabolisms and paradigms can be challenged by regenerative agriculture and longer-standing practices of agroecology, with their central aim of not only maintaining, but reviving and enhancing the health, resilience and adaptability of local ecosystems and their interdependent communities of beings and materials.

Throughout the project, we seriously considered what it might mean to take principles and commitments for soil and ecosystem health as a model for exploring what alternative forms of energy research and prototyping could emerge. We found regeneration to be a rich and also complicated concept to work with –ne that, in addition to its merits, is in need of critical attention for the ways in which it can be appropriated and/or shed of its community and political commitments[2].

An important moment early on in our collaboration with the Brände Udde farming site was receiving the leasing agreement from the VXO Farm Lab stewards of the plot. The text opened with "Welcome Future Urban Farmer!" and a description of how the farm was intended as a space for "Exploring, applying and sharing ideas for regeneration, sustainability and methods of resilient community development". The agreement was both a contract and a vision statement. One particular item in the "A few more things to consider" section grabbed our attention: "Only Biodegradables: We aim to abolish all use of petrochemicals at our sites. That means: no use of plastics or synthetic materials (if reasonably possible). If it can’t become food to your plants it shouldn’t be at the site!"

Following the commitments of the farm community led us to rule out off-the-shelf energy systems such as solar and wind, given the damaging practices around mineral extraction in the making of panels, and the environmentally hazardous end-of-life issues for these technologies. Our soil-centered commitments deposited us in new and unexpected directions with our prototyping and infrastructuring work. They oriented us toward cultivating regenerative materials and biodiverse relations that we could prototype with. They informed ways of working that opened up to intermittency, seasonality and slow engineering. They grounded, for example, our prototyping work on a mycelium-based wind turbine that aims to sustain and support collective growing cultures across energy, agriculture and soil health. This prototype explores processes such as the mycoremediation of heavy metals and other soil contaminants from the farm’s adjacent highway. It centers our work on the stimulation of mycorrhizal networks for plant health via topsoil nutrient highways (further excluding the need for synthetic fertilizers), diverse communities of microorganisms and biotic life, and micro energy experimentations within techno-ecological limits. These commitments also led to us make charge controllers from scavenged electronic waste that can regenerate depleted lithium batteries, in an effort to interrupt local waste streams whose contamination is outsourced to Majority World soils.

Humuspunk

Modes of prototyping that center soil health might be characterized by what we have dubbed as humuspunk[3]. Humuspunk acknowledges its rootedness in the soil and stands in contrast to more clear and systematized (“smart”) ecomodernist futures, embracing instead fermented and grimy modes of creativity and making, as they can emerge in a plurality of forms and spaces. As artist and researcher Filipa César notes when writing in 2016 about the revolutionary agronomist Amílcar Cabral, “Soil tells narratives of both the wretchedness and the liberatory potency of its humus.” And regenerative prototypes ground any imagined futures in the living, breathing, drinking, eating, farting, composting matter we call soil (humus: Latin for earth, ground).

Staying close to regenerative propositions and their attachments has had an important effect on our work, especially in the context of energy communities, which have most commonly been focused on renewables, modes of individual and collective ownership and forms of measurement and efficiency. Starting instead from a position of soil and ecosystem health has brought to the fore different solidarities and sets of reciprocal, regenerative relations as openings for discussion and experimentation. Soil has prototyped ways for us to shift how we imagine energy (but also art and design) communities based on soil and ecosystem health rather than on modes of control and monitoring energy use. The principles and propositions of these soil-centered local farming communities help us to feel out and explore different paradigms around energy, breaking through standard or normative technoscience approaches to energy and renewables. They make space for other types of transition, doing so through what have ended up being generative acts of closure (e.g., no plastics, nothing the plants can’t eat) and commitments that keep other awakenings alive and guide these collective explorations in unexpected and regenerative directions.

In Regenerative Energy Communities we have found that principles and commitments for supporting soil communities can act as grounding[4] points for accountable collective action and decision-making. In their capacity to frame and address both urgent and longer-term issues of solidarity and transformational ecological practices, they can serve as practical guidelines, vision statements and/or open-ended invocations for other ways of being and making together. Soil prototypes practices to promote soil health, biodiversity and technological pluralities. Our prototypes and workshops interweave soil and ecosystem health with technology, art, design and citizen science - soiling each of these fields along the way, while carefully considering what kind of relations we want to sustain and support in such prototyping.

In the same way that the "more-than-human" answer and paradigm has stimulated many areas of practice over the last decade, we would encourage further explorations on how crucial issues such as farming, soil and community-centered ecosystem health could inspire regenerative modes of operating within a range of practices, including technology and sustainable energy provision, but also further afield. Crossing knowledge and experiences toward a collective focus on soil, carbon, biodiversity and living in the ruins of big tech fossil capitalism together. How do we regenerate soil contaminated by polluting fossil fuel capitalism? How do we think through regeneration for rich, full flourishing lives? What are the governance and community foundations needed for these spaces? To regenerate with micro ecosystems of deep-time bacteria, nematode crushes and collective tendings to soil and its generative modes of prototyping?

Regenerative Energy Communities is a 3-year research project exploring questions of energy and agriculture through approaches of art and design. The research is carried out by team members Helen V. Pritchard (Basel Academy of Art and Design FHNW), Eric Snodgrass, Miranda Moss and Daniel Gustafsson (Linnaeus University, Department of Design+Change)

(1) https://regenerative-energy-communities.org

(2) For instance, see the recent IPES-Food report “Smoke & Mirrors” for an overview of some such risks (http://www.ipes-food.org/pages/smokeandmirrors), and also Tittonell et al.’s 2022 piece “Regenerative agriculture—agroecology without politics?”

(3) https://regenerative-energy-communities.org/lingo/humuspunk

(4) See the the jointly written (with Cassandra Troyan and Fred Carter) call for the Groundings conference for more on how we understand acts of collective grounding: https://regenerative-energy-communities.org/groundings

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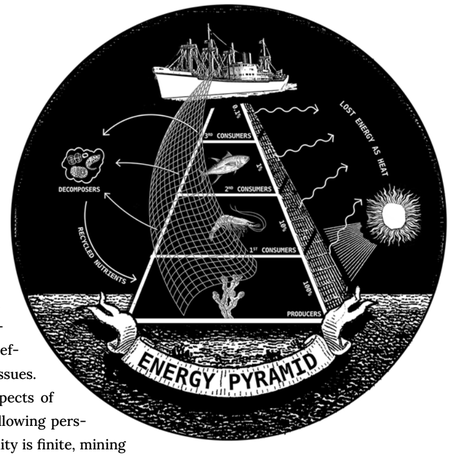
Eating the Sun

DISNOVATION.ORG

Exploring Human Sustainability as Solar-Based Regenerative Networks

Through an economic lens, this text explores how solar energy circulates through the biosphere as a primary life-supporting value. Photosynthetic organisms convert solar energy into organic matter, generating the carbon compounds that form the basis of life on Earth. Energy from the sun is the basis of the entire food chain and fuels human activities, such as gathering, hunting, fishing, agriculture, cooking, heating, and building. This investigation examines the terrestrial metabolization of solar energy as a means to reconsider the concept of sustainability. It explores how heterodox economic representations could inform governance to achieve lighter ecological footprints and sustainable human coexistence within ecosystems.

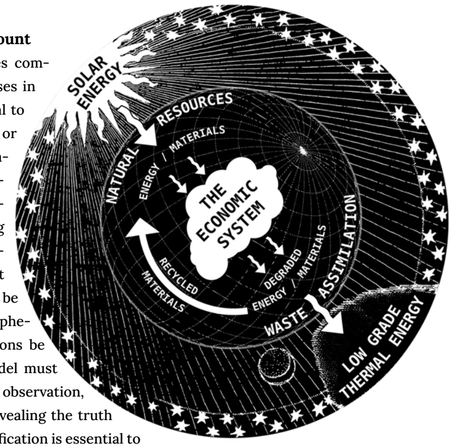


In Search of Sustainability

What does sustainability mean? We propose to examine sustainability as a social goal for humans to coexist on Earth over a long time. Since the sustainability of the material affordances of human needs is a core topic in economics, we will explore how a broader comprehension of economics, value, and accounting can effectively address such ecological issues. We propose to embrace the prospects of human 'sustainability' from the following perspective: Earth's geological materiality is finite, mining is irreversible, and geological matter is poorly recyclable. Consequently, only the network of matter-energy fueled directly and indirectly by the Sun can be understood as truly sustainable.

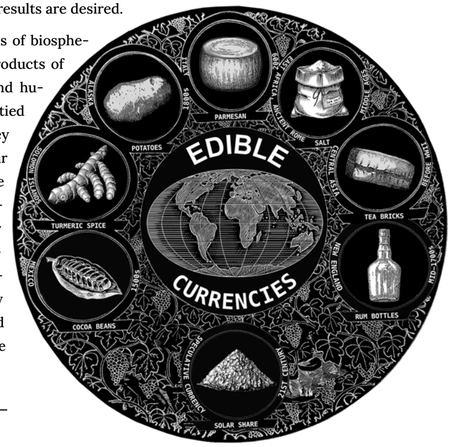
What Isn't Counted Doesn't Count

Accounting as a practice involves complexity reduction, generating biases in the process. It is therefore critical to question what is being measured or quantified. Quantification is the basis of all modern economic rationality, but quantification is incomplete by definition. Understanding that all elements of an environment are in symbiosis and cannot exist independently, it can neither be sufficient to examine any isolated phenomena nor can sufficient relations be enumerated. Any accounting model must be seen more as an instrument of observation, especially control, than as one revealing the truth of a circumstance. Further, quantification is essential to digital cybernetic operations that are designed to conform living beings to desired models of productivity and activity. In this sense, accounting can only be understood as part of a regime of governance. What is measured, and how it is measured, has to do with what results are desired.



Distinguishing Value From Money

"The cost of a thing is the amount of life which is required to be exchanged for it" (H. D. Thoreau). While monetary accounting systems are commonly used to assess sustainability, they are inadequate to the task of balancing human needs within planetary boundaries. Quantifying the value of goods or environmental assets in monetary terms — of a viable ecosystem, for example — is doomed to produce insufficient and varying assumptions due to methodological, regional, and ideological factors. In contrast to monetary accounting, alternatives which employ plant-based units with inherent metabolic value can provide valuable insights into our sustainability challenges. Historical examples such as cocoa beans, hemp, beer, or tea bricks are tangible accretions of biospheric photosynthesis, representing products of ecosystem energy flows, stocks, and human labor. Their "intrinsic value" is tied to the photosynthetic biomass they contain, the labor invested in their cultivation and preservation, and the underlying biodiversity that supports the ecosystems of which they are a part. By emphasizing the interconnectedness of goods and services with their origins in planetary biophysical processes, plant-based units can help model a sustainable global economy.

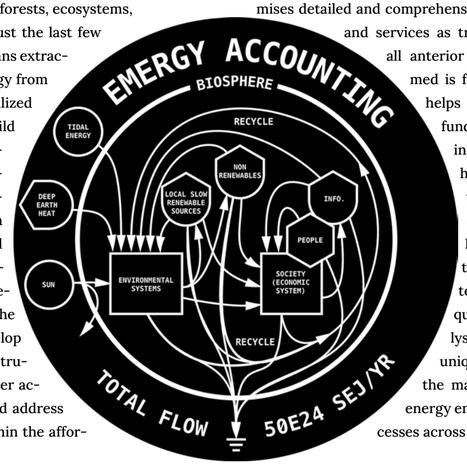


Energy as a Universal Currency

The study of energy flows as a fundamental unit for comprehending economic interactions finds its origins in recognizing the Sun's role as the primary source of energy on Earth. This idea is rooted in various cultural, scientific, and philosophical perspectives as noted by V. Vernadsky: "The biosphere is as much, or even more, the creation of the Sun as it is a manifestation of Earth-processes. Ancient religious traditions that regarded terrestrial creatures, especially human beings, as 'children of the Sun' were much nearer the truth than those which looked upon them as a mere ephemeral creation". Similar visions explored how solar energy flows and stocks fuel terrestrial systems, and how trophic chains drive vital processes to form the basis of our economic and ecological existence. "Earth is a chemical battery where, over evolutionary time, billions of tons of living biomass were stored in forests, ecosystems, and fossil fuels. In just the last few hundred years, humans extracted exploitable energy from these living and fossilized biomass fuels to build the modern economy". By recognizing the matter-energy of solar origin that is circulated within the Earth system, via photosynthesis on land and in the ocean, we can develop new economic instruments that help better account for, model, and address anthropic needs within the affordances of the planet.

Accounting for Historical Solar Energy

To unfold our investigation into solar value, we propose to look at Emergy (with an M), an accounting method proposed by American ecologist H. T. Odum in the 1970s to analyze energy flows in ecosystems. In the Emergy model, the Earth system, biosphere, and all human activity on the planet from the most rudimentary to the most industrialized are examined as transformations of solar energy flows. Emergy provides a unit: "solar-equivalent joules", which allows us to model an energetic economy of the Earth related to solar income (for instance, 1 joule of plant matter is the product of 40,000 solar-equivalent joules). This systemic approach can be applied to concrete examples, such as the food chain or the economic flow of a country. It models the interconnectedness of ecological and economic cycles, much like a circuit diagram. Emergy promises detailed and comprehensive modeling of goods and services as tree structures, where all anterior solar energy consumed is factored in. Though it helps to radically rethink fundamental questions in economics, such as how to adequately value a commodity. While the Emergy method is not intended for exact quantitative analysis, it provides a unique insight into the magnitudes of solar energy embedded in vital processes across the economy.



Planetary Photosynthesis as an Indicator of Renewable Flows

Since 2000, ground data and satellite imagery of photosynthetic processes monitored on a planetary scale are increasingly confirming earlier theories of solar value flows. Recent instruments developed for planetary observation provide data that inform our understanding of the links between solar energy, autotrophic biomass — microalgae, algae, plants — and global human needs. This data provides estimates of the quantity of stored energy generated by photosynthesis, which is critical for sustaining human activity on the planet. NASA's annual Net Primary Production (NPP) figures illustrate and estimate the primary work of the Earth's ecosystem, which continually captures solar energy via photosynthesis and physically stores it in living matter, sustaining flows in the rest of the living organisms. NPPs can now be used to test and challenge the hypotheses of the last century linking sustainability and biomass energy. The annual NPP is estimated to be 104.9 petagrams of carbon per year. We propose to provisionally consider this as "solar income", a reference for the primary matter-energy budget renewed via photosynthesis each year in the Earth system. This hypothesis enables us to construct realistic "strong sustainability" scenarios that recognize the maximum biomass energy available to all living beings.

Accounting for Historical Solar Energy

We need to recognize the limits of renewable energy, as the mathematician-economist Nicholas Georgescu-Roegen has pointed out: "Future generations will still be able to access their inalienable share of solar energy. However accessible material low entropy is by far the most critical element from the bioeconomic viewpoint, [...] a piece of coal burned by our forefathers is gone forever, just as is part of the silver or iron mined by them". Today, any circulation of energy in industrialized human society requires the use of non-renewable minerals. Even renewable energy infrastructures rely intensively on non-renewable mineral resources, raising critical justice concerns about the intergenerational allocation of finite resources. For the physicist José Haloy, technologies characterized by non-renewables, planned obsolescence, and fossil fuel use are "zombie technologies" that, as waste, continue to affect the biosphere after they are "dead," destined to haunt humanity for ages.

The Limits of Biomass Exploitation

NPP, a measure of renewed autotrophic biomass mentioned above, is estimated based on satellite observations of fluorescence produced during photosynthesis. But how do human activities relate to this process? A significant proportion of photosynthesis production (NPP) is consumed by humankind, either directly for food, fiber, livestock, and wood, or indirectly through land use. The Human Appropriation of Net Primary Production is an indicator (HANPP) that represents vectors of appropriation, extraction (setting nature to work), and transfers of wealth (exploitation) from the biosphere and its biodiversity to human societies; from rural areas to cities; from peripheral regions to megalopolises; from the Global South to the Global North; from oceans to land. HANPP is currently estimated at 25% to 40% of global photosynthetic production (NPP). As an indicator of the decline in biodiversity, a critical HANPP threshold of well below 50% of NPP has been identified as likely to trigger irreversible systemic disruption. How can we use these complementary indicators at both global and ultra-local levels to guide sustainable human projects on this planet? Can these indicators help reorient economic policy away from the narrow imperatives of GDP growth, and "green" profiteering?

The Solar Share, a Portion of the Biosphere's Work

Autotrophs give life to the Earth. Photosynthetic organisms can effectively slow down the speed of light by converting solar energy into persistent carbohydrates. This phenomenon provides the basis for a tangible method of reconsidering human activities as embedded in Earth's ecosystem processes. Starting from an accounting of photosynthetic biomass, human-available metabolized energy income from the sun, it becomes possible to elaborate a basic energy unit, a "solar share" on which comprehensive models of accounting for human material needs within the affordances of the planet can be built. Such a unit can meaningfully and reliably inform sustainable governance of human-ecosystem interactions, emphasizing the pivotal role of photosynthetic organisms and the ecosystems they regenerate. The Solar Share can bridge between our cosmic origins and our common cause of long-term planetary viability.

This investigation prefigures The Solar Share, an artistic research by disnovation.org, a research collective whose core members include Maria Roszkowska (Pl/Fr), Nicolas Maigret (Fr), Baruch Gottlieb (Ca/De) and Jérôme Saint-Clair (Fr).

"Peasant": a problem of definition

BUREAU D'ÉTUDES

Community Research on the Melipona Bee
https://spore-initiative.org

The term "peasant" refers to an attachment to a soil, to a terroir, to living soil, as opposed to land considered merely as a medium. Via Campesina, the world union of peasants, recalls the 2018 United Nation definition: "a peasant is any person who engages or who seeks to engage alone, or in association with others or as a community, in small-scale agricultural production for subsistence and/or for the market, and who relies significantly, though not necessarily exclusively, on family or household labour and other non-monetized ways of organizing labour, and who has a special dependency on and attachment to the land." According to this definition, "peasants" can be distinguished from indigenous peoples.

Conflicts and cohabitations among cosmologies

How can we describe peasant cosmology ? Bentley B. Allan, in his study of the structure of international orders since the 16th century, highlights a generative structure with several levels. The top level of international order is made up of secondary institutions, agreements and treaties, which are established on the basis of primary institutions, the beliefs, norms, goals and values by which secondary institutions are determined, which themselves rest on more fundamental elements he calls "cosmological elements"[1]. Cosmology underpins the primary and secondary institutions of international order, the whole forming a "generative structure"[2].
This distinction between a fundamental cosmological level and primary and secondary institutions, all interconnected in a generative structure, enables us to distinguish between agrarian types:

- an industrial or conventional agrarian type, where, for example, the farm's survival could depend on a 5-cent variation in the price of pork per kilo;
- a peasant or neo-peasant agrarian type that sells in more or less short circuits, whose production method tends towards autonomy and whose production prices depend closely on the moral economy associating producer and consumer.

These two types of farming do not create the same society: the ideal type of peasant society[3] differs from that of corporate agriculture, foreshadowed by plantation farming, or cash crop farming[4], which does not sit well with the communal mode of production.
They are not part of the same culture, nor do they establish the same relationships with animals and plants. And they sometimes live right next to each other, sometimes just a few hundred meters apart...
To speak of a peasant society is to take down the myth popularized by the Ricardo-Malthusian vision, whereby economic growth in the peasant world is a contradiction in terms, because technology is static, and peasants are supposedly unable to control population size. According to this view, diminishing returns were inescapable, and demand inevitably and regularly exceeded supply[5]. But rural inertia was challenged in several ways: contrary to popular belief, peasants were technologically more innovative than landowners[6]. And the expulsion of peasants from their land, the enclosures, did not always increase agricultural labor productivity, calling into question the method of self-subsistence. Thus, in Italy, where peasants were expelled from land ownership much earlier than in England (where serfdom was virtually abolished in 1300, peasant communities were weak and "bourgeois" property was predominant), labor productivity stagnated after 1500.

From peasants to neo-peasants

The irruption of the market and the state had a profound effect on peasant society, marking a "historical watershed" that led to the distinction between "peasant" and "neo-peasant". The new moral peasant economy of the neo-peasants is no longer based on self-subsistence and self-sufficiency, as in Alexander Chayanov's model of the peasant economy[7]. Peasants in France inherit and claim a peasant ethos, but almost all of them have attended agricultural high schools. They therefore combine knowledge derived from experience, inherited from the family or learned on the job, with an agronomic and technical culture acquired at school. They form a "third model", neither solely experimental/positivist/technical, nor solely experiential or customary, based both on practical knowledge and on agronomic, botanical or zootechnical knowledge and vocabulary. Some of this knowledge is "popular science", evident as early as the 16th century in European Almanacs and Calendars.
So, on a global level today, "peasant" means several things. We can't lump together under the term "agriculture" practices and ways of life as different as those of the 28 million farmers on the planet equipped with tractors, or of the 250 million who use oxen, mules and zebus, the billion people who work by hand[8], the 475 million farms worldwide of less than 2 hectares. And tractor users include not only corporate and commercial farmers, but also neo-peasants.

(1) Allan, Bentley B., Scientific Cosmology and International Orders, Cambridge University Press, 2018. p. 33

(2) Buzan, Barry, From International to World Society? English School Theory and the Social Structure of Globalisation, Cambridge, Cambridge University Press, 2004.

(3) On the peasant economy, see T*he Journal of Peasant Studies*.

(4) Cash crop farming is oriented towards crops that are most likely to enter the market and produce a profit. It is often contrasted with subsistence farming. Plantation agriculture is a type of agriculture that specializes in the production of cash crops.

(5) Grantham, G. W., *Contra Ricardo: On the Macroeconomics of Pre-industrial Economies*, (1993), 1999.

(6) Epstein, S. R., *Freedom and Growth: the Rise of States and Markets in Europe*, 1300–1750, New York, Routledge, 2000.

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