ENVIRONMENTAL LOGIC, 1

ON THE CONSTITUTION OF NATURE THROUGH SOCIAL MODES OF INTERCOURSE

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ENVIRONMENTAL LOGIC, 1:
HOW IS NATURE CONSTITUTED IN SOCIAL WORLDS?

ENVIRONMENTAL LOGIC, 2:
WHAT IS A SOCIAL ENVIRONMENT?

ENVIRONMENTAL LOGIC, 3:
WHAT IS THE LOGIC OF COMMUNIST TRANSITION?

1. WORLDS
2. SOCIAL WORLDS
3. MODES OF INTERCOURSE
4. THE APPEARANCES OF NATURE

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"We hope to make clear that ecology's wager of mapping and rethinking the borders between the social and the natural is not merely compatible with our framework but, in fact, integral to it. For that, we will argue that these different modes of intercourse and their combinations imply not only different forms of relation to nature, but in fact different ways that nature is constituted as the "other" of sociality from the perspective of each of these social forms understood as modes of intercourse. Therefore, this positions our "transcendental" framework as a way to attain a new perspective on the social history of nature."

STP, *Atlas of Political Experimentation,* Section VIII: Seeing Nature:
Capitalism, Ecology and Intercourse as metabolism

CATEGORIES OF WORLD LOGIC

A. In any given context, not every difference makes a difference. Let us call these particular situations, **logical contexts** and a point of view that singles out only the relevant differences the **transcendental** point of view.

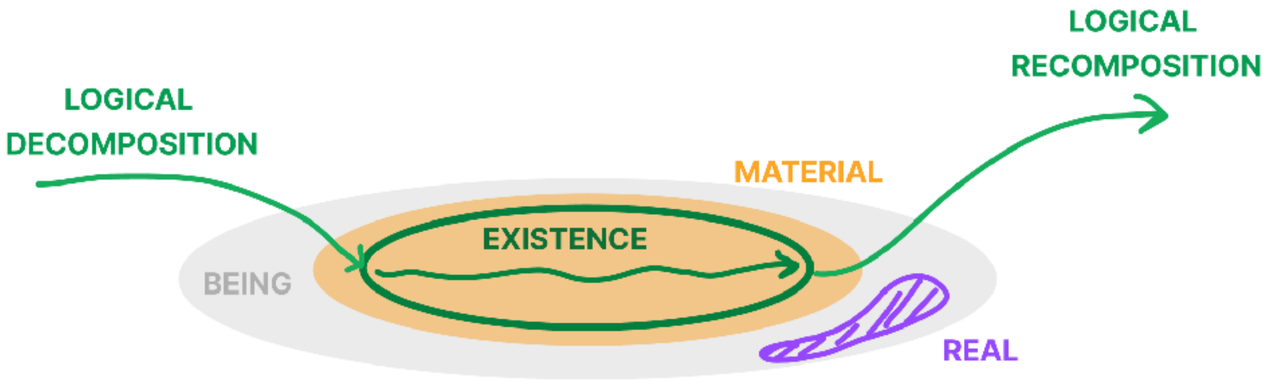
B. For specific logical contexts to cohere, some conditions must be met:

> **B1.** One must be able to define the atomic granularity of that context, beyond which differences do not make a difference – its basic **analytic** component**.**
>
> **B2.** This logical atom must, however, preserve enough information to allow us to generate new compatible atoms and combine existing ones - it must have **synthetic** power.
>
> **B3.** Finally, the atomic differences that make a difference in that context must be supported and propagated by a substrate that is essential indifferent or irreducible to it - its **material** basis.

C. For a logical context to establish objectivity and regional coherence, one must find ways to propagate differences that abide to clauses B1, B2 and B3. In other words: **that there is a transcendental point of view does not guarantee that there is a global synthesis of a logical space**.

D. A regionally coherent logic becomes globally consistent when it can guarantee that, for any new situation that presents itself, there is a way to integrate it to its logical space - a system which presents such a property is called a **world**.

ANATOMY OF A WORDLY COMPONENT



Depiction of a local part – or atom – of a world

WORLDS
Any domain which we can decompose and recompose according to a certain logic and produce entities that remain coherent parts of that domain.

EXISTENCE
The quality of any being insofar as it is taken up as a coherent part of a world.

BEING
The point of view that considers parts of a world only insofar as they are multiples, with no further characteristics. There is a "world of being", called *ontology*, which composes and decomposes multiples such that the product of any operation remains part of the domain of multiples - its called set theory (or ZFC axiomatic system, more specifically).

MATERIALITY
The part of a multiple whose inner logic is “black boxed" to the a world in which that multiple exists, it is therefore integrated into the world only as “chunks" of stuff, whose specific logic can only be decomposed and analyzed as such when considered as part of a different world.

REAL
The part of the multiple that supports the existent that actually resists integration into the logic of a given world, remaining inaccessible or irreducible to it.

SINGLING OUT SOCIAL WORLDS

A. For something to be “social" it is not enough that it directly involves humans, nor that it involves many people - it implies a type of **interdependence between living systems.**

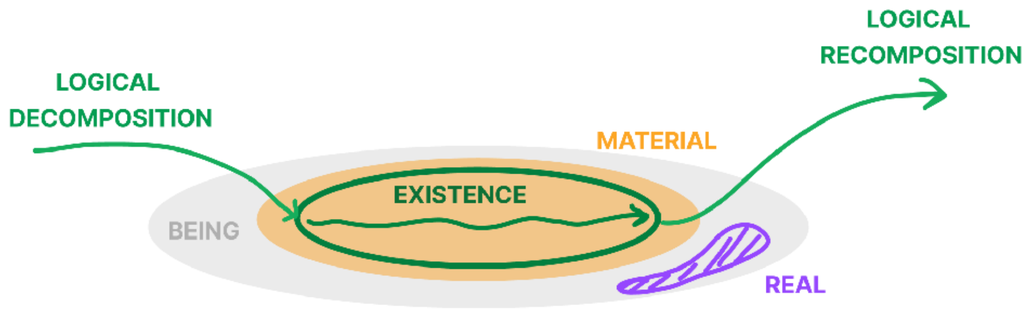
B. We can distinguish at least three different types of interdependent relations between parts and wholes in living systems:

> **B1.** An organism is itself a living system composed of parts that are equally living, called organs - this is **organic interdependence.**
>
> **B2.** An ecosystem is not itself a living system but it is composed of living organisms concerned with their own individual survival - this is **ecological interdependence.**
>
> **B3.** A social system is not itself a living system and it is composed of living parts that are not directly determined by their individual survival, which is only guaranteed indirectly - this is **social interdependence**.

C. In a social system, the differences that make a difference for an living individual and those that make a difference for the socio-logical space diverge drastically.

D. Because of this divergence, **social contexts cannot count on immediate survival as the basis for propagating relevant social differences**, forming social worlds. This requires social worlds to be formally “plastic” in order to constitute globally synthetic structures.

SINGLING OUT SOCIAL WORLDS



BEING = MATERIAL = EXISTENCE

MATHEMATICS

We can always decompose the "stuff" of systems into new parts and it will remain part of the system (being=material) and every new intelligible point of view on a structure remains part of mathematics (material=existence).

Ex: to open the black box of mathematical structures is a mathematical operation –and every intelligible point of view given to mathematic structures, through modeling, remains also mathematical.

BEING = MATERIAL ≠ EXISTENCE

PHYSICS

We can always decompose the stuff of a system and remain within physics (being=material), but not every logic that organizes the material is part of physics (material≠existence) - hence the struggle to fit certain dynamics and phenomena into physical laws, which are limited.

Ex: a same system can be analyzed from a micro or an aggregate point of view, and those remain both physical, but not every logical structure supported by the material under analysis is part of physics – human behavior is physics-dependent but not part of the world of physics.

BEING ≠ MATERIAL = EXISTENCE

ECOLOGIES

We cannot decompose the stuff of life into ever new parts – there are limits to what counts as a living system, as an organ (being≠material). But given any material substrate that can be caught up in life, every intelligible point of view we adopt on it is essentially part of the same point of view, of evolution and survival (material=existence)

Ex: life depends on a separation between its form and the material exchanges it establishes with the surroundings, but the logic of the living form, no matter how heterogeneous, connects everything that makes a difference to life into the same general logic.

BEING ≠ MATERIAL ≠ EXISTENCE

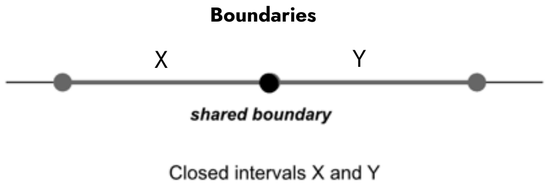
SOCIAL WORLDS

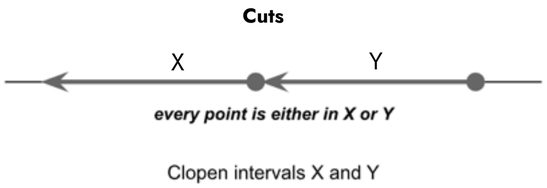
Not every decomposition of the material basis of a social world is social *(being≠material), nor every relevant structure conditioning social reality can be seen from the same point of view (material≠existence).*

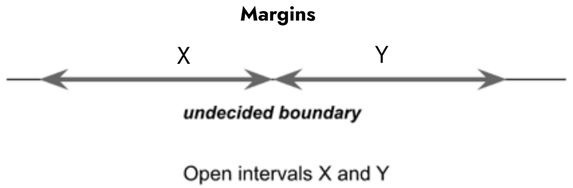
Ex: the basic principle of the division of labor is that the the logic of collective survival is no longer dictated by the logic of any particular living creature – hence the material support of social life, human and non-human reproduction, becomes determined by social reproduction, this allows social reality to submit its own material to decompositions that do not respect its form, creating a tension between the material and its multiple being.

KARATANI'S THREE MODES OF INTERCOURSE

	MODE A (T^A)	MODE B (T^B)	MODE C (T^C)
Logic	Affinity	Property	Value
Form	Gift and counter-gift	Enclosure and alienation	Commodity exchange
Order	Rules	Law	Tendencies
Unstable Form	War	Revolution	Crisis
Example	Families, affinity groups, nations, etc.	Contracts, pacts, juridical entities, States, etc.	Commodities, money, capital, etc.
Logical structure	Paraconsistent logic	Classical logic	Intuitionistic logic
Basic topology	Closed set topology	Clopen set topology	Open set topology







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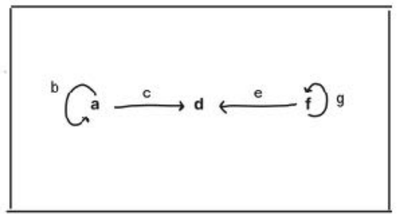
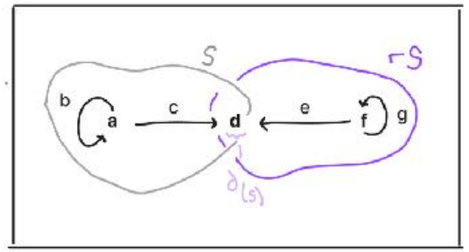
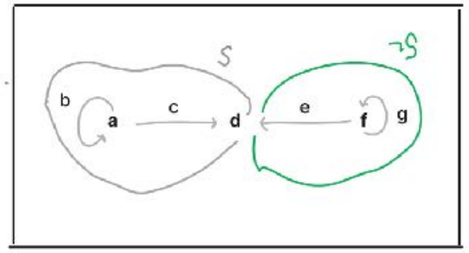
Decomposition of graphs

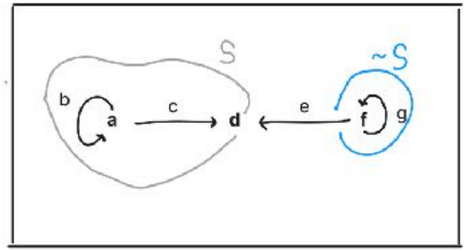




(A) Co-Heyting

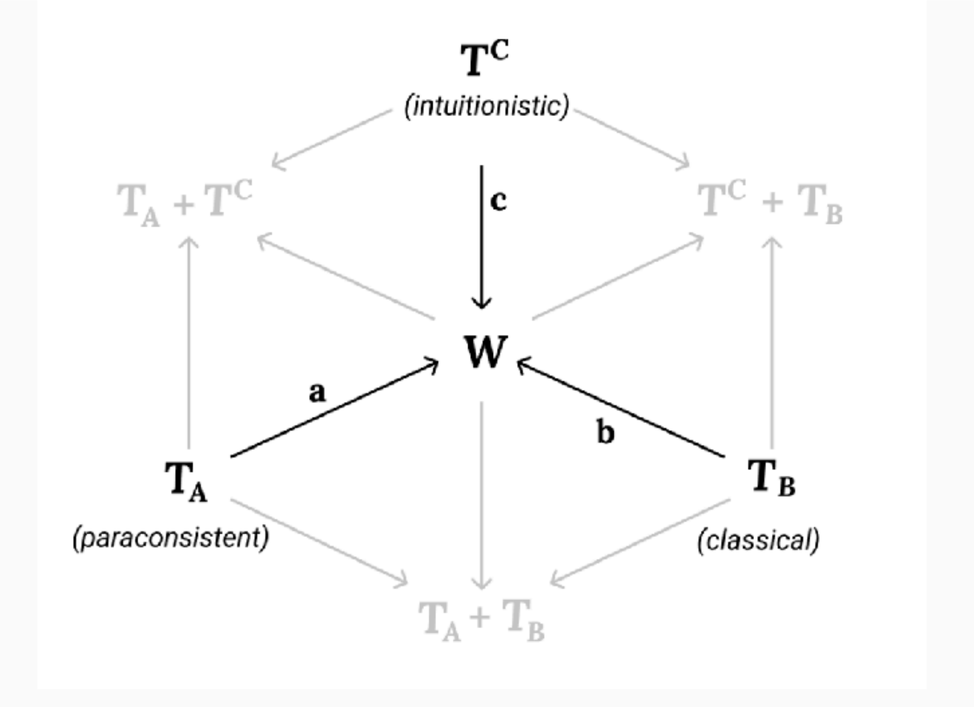


(B) Boolean



(C) Heyting

COMBINATION OF MODES IN A SOCIAL WORLD



A social world **W** is made up of mixtures of these three modes, and these mixtures can be decomposed into structures made of consistent pairs of social layers

INTERCOURSE AS MATERIAL EXCHANGE

The intercourse of men is the human workshop wherein individual men are able to realise and manifest their life or powers. The more vigorous their intercourse the stronger also their productive power and so far as their intercourse is restricted their productive power is restricted likewise. Without their life-medium, without the exchange of their particular powers, individuals do not *live*. The intercourse of men does not originate from their essence; it *is* their real essence.[16]

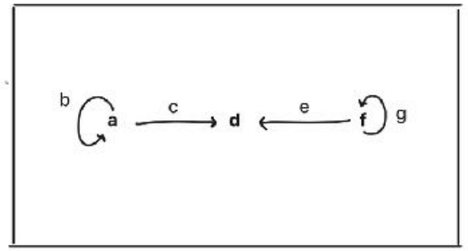
Moses Hess, *The Essence of Money*

In Hess's view, the relation of man and nature is intercourse. More concretely, it is metabolism (*Stoffwechsel*), or material exchange. In German, *Wechsel* literally means "exchange," so that the relation of humans to nature is one of intercourse or exchange. This is an important point when we consider Marx's "natural history" perspective—as well as when we consider environmental problems.

Hess next points out that this sort of relation between man and nature necessarily takes place by way of a certain kind of social relation between people. This too consists of a kind of intercourse. In this case, Hess cites as modes of intercourse plunder ("murder-for-gain"), slavery, and the traffic in commodities.[17] In his view, as traffic in commodities expands, this mode replaces plunder and slavery (that is, the use of violence to steal the products of others or to force them to labor), yet in the end this amounts to carrying them out in another form, through the means of money. This is because a person who possesses money is able to coerce others. In this, the various capabilities of people are alienated from them in the form of money. Moreover, the division and coordination of people's labor come to be organized by capital, regardless of their intention.

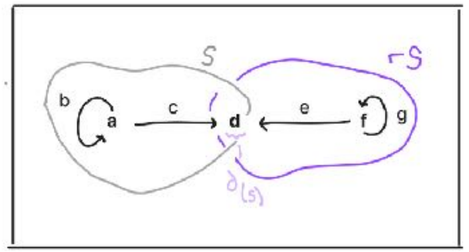
Kojin Karatani, *The Structure of World History*

THE DOMAIN OF MODES OF INTERCOURSE



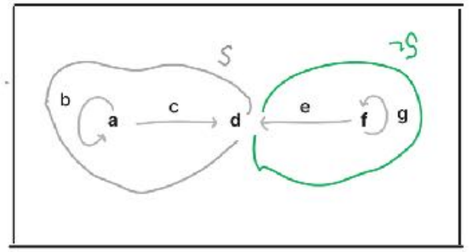
These processes (**a** to **g**) can take place between humans, between humans and non-human actors, or even only between non-humans. What the modes define is that, whatever processes or interactions these are, **in order to be socially integrated under a given mode they must be amenable to consistently being decomposed and recomposed according to the mode's logic**.

Affinity **Boundaries**



(A) Co-Heyting

Property **Cuts**



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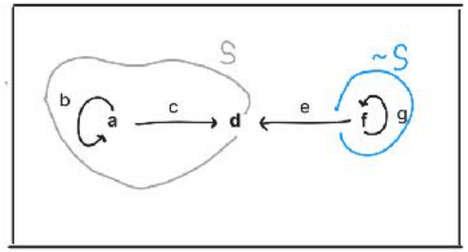
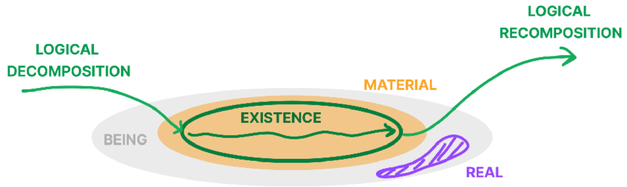
Value **Margins**



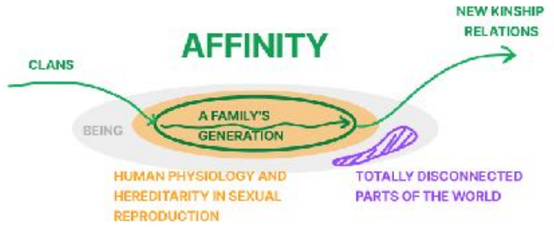
(C) Heyting

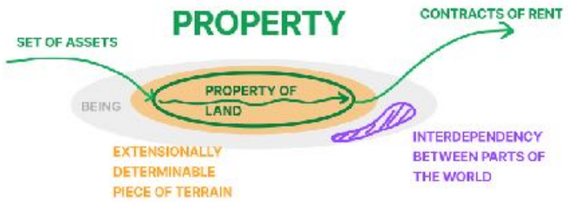
Therefore, a mode of intercourse does not depend on a previous distinction between humans and non-humans, or human created spaces and non-human ones – "natural" is therefore not the opposite of "social": **there is no unified concept for what exists outside of a social world.**

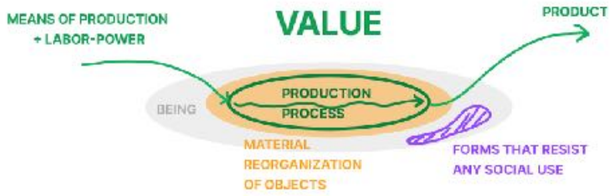
SOCIAL EXISTENCE AND ITS MATERIAL SUPPOI

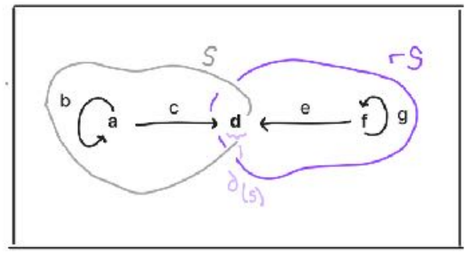


The logical consistency of a social “atom" relies on there being a material support that – even if its inner workings are not fully compatible with the given mode or combination of modes – as a “black box” supports the social logic in a coherent way.









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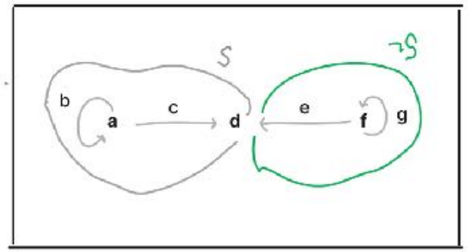

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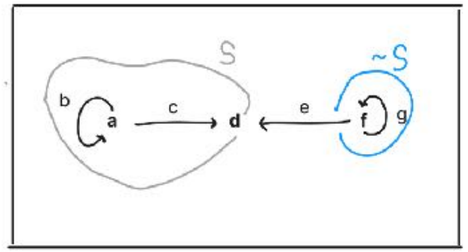
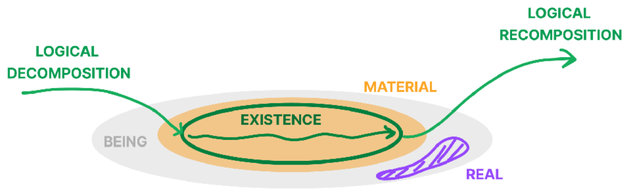


(C) Heyting

TYPES OF MATERIAL SUPPORT IN SOCIAL WORLDS



The logical consistency of a social “atom" relies on there being a material support that – even if its inner workings are not fully compatible with the given mode or combination of modes – as a “black box” supports the social logic in a coherent way.

Social atoms are necessarily localized on living systems, whose reproduction is guaranteed by the logic of a social world.

But one can generate new social parts out of these necessary ones, to include:

(1) Parts of these living systems that do not correspond to any biologically relevant components: gestures, positions, stages of life, behaviors, features, pathologies, etc...

(2) Living systems whose reproduction is not fully, or not even partially, dependent on the social world in question: other species, forests, whole biomes, pets, etc...

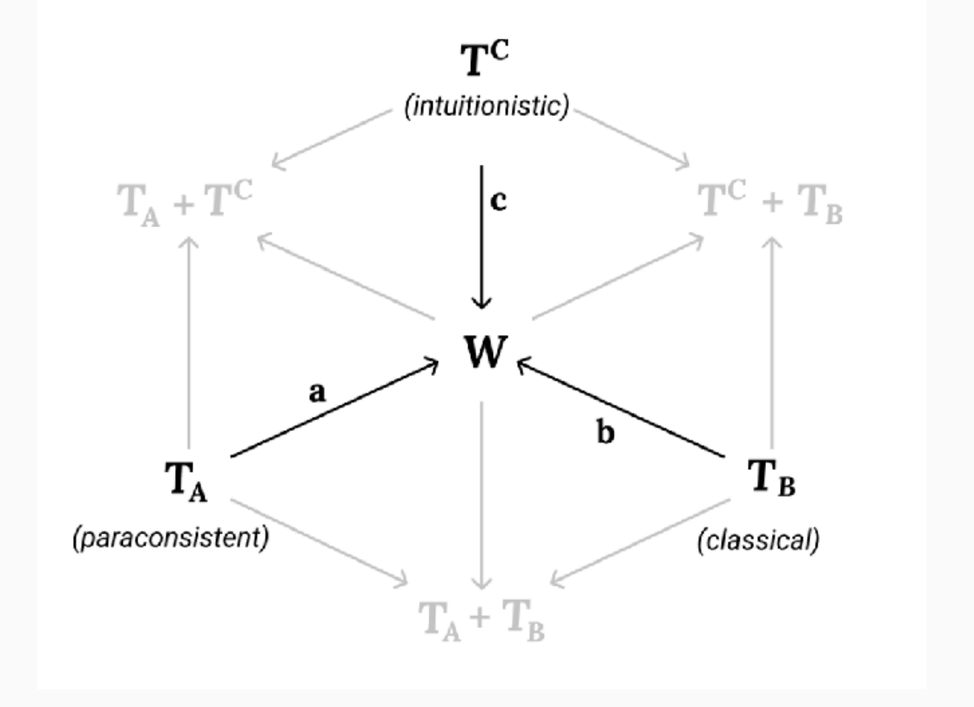
(3) Non-living systems whose reproduction is fully conditioned by the social system: tools, buildings, devices, etc....

(4) Non-living systems whose reproduction is not fully, or not even partially, dependent on the social world in question: deep earthly structures, the weather, the stars, etc...

All of these can be integrated into a social world as long as they propagate (that is, record, conduce, unfold, etc) the logical form of the world in question.

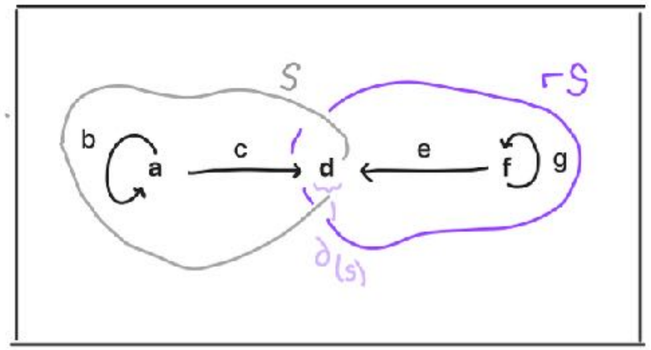
“Nature” is the name we give to the material support of social parts *in general*. And though not everything is nature – since not everything is in a social world – the fact here is no one concept for what is "not social" also means there is no one concept for what is "not natural”.

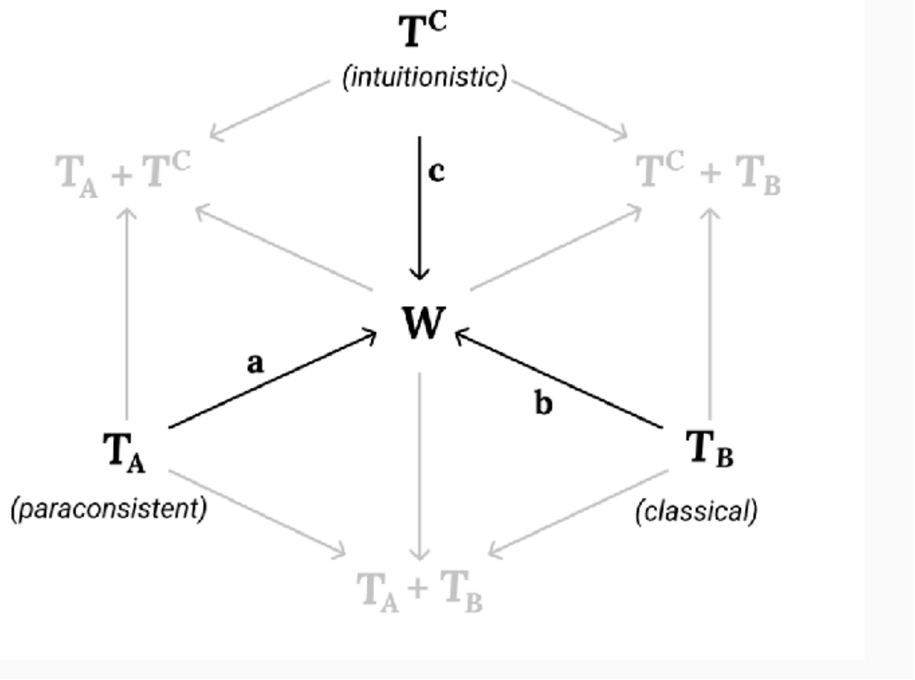
TYPES OF MATERIAL SUPPORT IN SOCIAL WORLDS



Each mode of intercourse, insofar they create either shared boundaries, or abstract cuts or fuzzy margins between systems that interact, conditions differently the way nature is constituted and appears in a given social space. Besides the appearance of nature in a single mode, we must also consider that these are combined to form more complex entities, ultimately constituting the way the material basis of **W** appears to itself.

NATURE AS PERSON OR PARTNER





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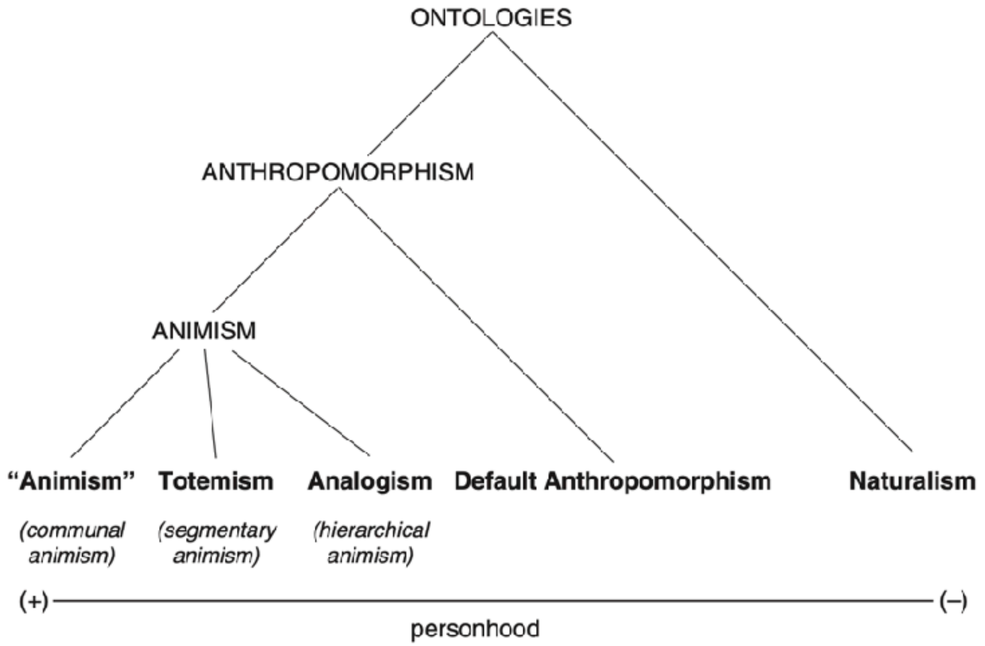
NATURE AS PERSON OR PARTNER

Whether one takes Philippe's determination of animism as "the attribution by humans to nonhumans of an interiority identical to one's own" (2013: 129), or something like Graham Harvey's "animists are people who recognize that the world is full of persons, only some of whom are human, and life is always lived in relationship with others" (2006: xi), these notions of the subjective personhood of nonhuman beings apply as well to the archetypal totemism of Aboriginal Australians and the exemplary analogism of native Hawaiians as they do to the paradigmatic animism of Amazonia. Rather than radically distinct ontologies, here are so many different organizations of the same animic principles. Classical animism is a communal form, in the sense that all human individuals share essentially the same kinds of relationships to all nonhuman persons. Totemism is segmentary animism, in the sense that different nonhuman persons, as species-beings, are substantively identified with different human collectives, such as lineages and clans. (Apologies to Marx for this adaptation of "species-being.") Analogism is hierarchical animism, in the sense that the differentiated plenitude of what there is encompassed in the being of cosmocratic god-persons and manifests as so many instantiations of the anthropomorphic deity.

Marshall Sahlins, *On the ontological schema of 'Beyond Nature and Culture'*



NATURE AS PERSON OR PARTNER

Agency is attributable to those persons (and things, see below) who/which are seen as initiating causal sequences of a particular type, that is, events caused by acts of mind or will or intention, rather than the mere concatenation of physical events. An agent is one who 'causes events to happen' in their vicinity. As a result of this exercise of agency, certain events transpire (not necessarily the specific events which were 'intended' by the agent). Whereas chains of physical/material cause-and-effect consist of 'happenings' which can be explained by physical laws which ultimately govern the universe as a whole, agents initiate 'actions' which are 'caused' by themselves, by their intentions, not by the physical laws of the cosmos. An agent is the source, the origin, of causal events, independently of the state of the physical universe.

Putting the word 'social' in front of the word 'agent' is in a sense redundant, in so far as the word 'agency' primarily serves to discriminate between 'happenings' (caused by physical laws) and 'actions' (caused by prior intentions). 'Prior intentions' implies the attribution to the agent of a mind akin to a human one, if not identical. Animals and material objects can have minds and intentions attributed to them, but these are always, in some residual sense, human minds, because we have access 'from the inside' only to human minds, indeed to only one of these, our own. Human minds are inevitably 'social' minds, to the extent that we only know our own minds in a social context of some kind. 'Action' cannot really be conceptualized in other than social terms.

The immediate 'other' in a social relationship does not have to be another 'human being'. My whole argument depends on this not being the case. Social agency can be exercised relative to 'things' and social agency can be exercised by 'things' (and also animals). The concept of social agency has to be formulated in this very permissive manner for empirical as well as theoretical reasons. It just happens to be patently the case that persons form what are evidently social relations with 'things'. Consider a little girl with her doll. She loves her

Alfred Gell, *Art and Agency*

NATURE AS PERSON OR PARTNER

The paraconsistent logic of mode A implies a profound dialectic of symmetry and asymmetry: two systems that share a boundary are placed in symmetry, since the limit between them belongs to both – this implies, however, a disequilibrium: which of the systems gets to posit the value of such limit?

The very fact that, to remain within the logic of affinity, such symmetric boundaries need to be maintained, explains why the logic of the gift and the counter-gift is so strange: if the counter gift was equivalent to the gift, that would mean the initial actor would have determined the boundary asymmetrically – so it is important, for logical reasons, that the counter-gift re-establish the boundary or common ground in its own terms, to reinstitute symmetry through a mismatch between the things exchanged.

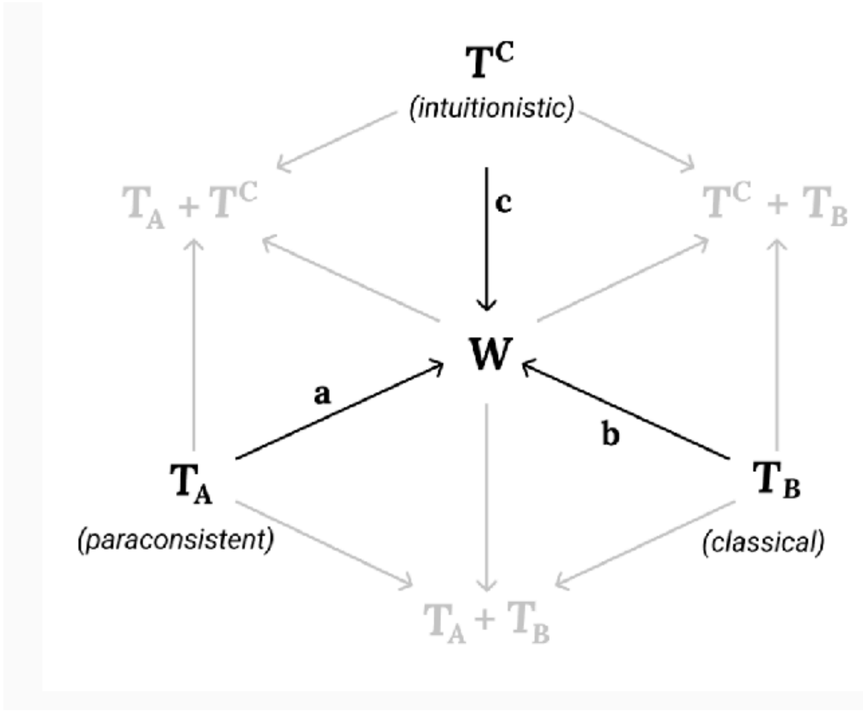
Using Bogdanov's theory that activity and resistance are relative concepts, and that resistance to action is how environments are distinguished from actors, we can then derive the corollary explored by Alfred Gell that, under mode A, the notion of actor, or agent, is essentially invertible: nothing guarantees, initially, that in an interaction between a human being and a non-human being, the former will always constitute the active side.

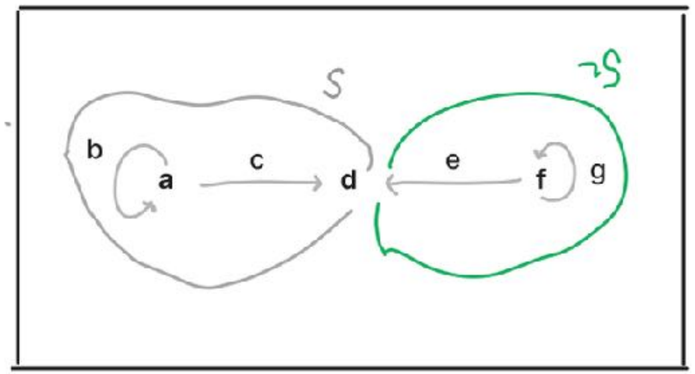
This means that nature, and every consistent part of nature, is constituted in mode A as (1) always sharing common ground with something else, (2) always being the potential source of a perspective that defines the limits and values of boundaries, (3) an actor or agent.

A possible name for the substance that has these three characteristics (common ground, perspective, agency) is "soul", or **anima**, and for the entity that possesses anima is a **person**.

Evidently, not every aspect of the material basis of social worlds is conductive to this symmetric logic – but some are, such as pray-predator systems (the prey is also a predator), sexual reproduction (the generated also generate new beings), the cycles of the sun (day is between two nights, and vice versa), the mourning of the dead (which are dead but live on in us), the logic of speech itself (where the other receives but also creates the meaning), etc. These are potential material supports to different arrangements of affinity, and they appear themselves as potential actors with whom we partner up and negotiate.

NATURE AS RESOURCE





1. WORLDS
2. SOCIAL WORLDS
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NATURE AS RESOURCE

In the terms of the relationship between technology and nature, the innovations achieved by ancient civilizations had little impact. But they were epochal in terms of the techniques for ruling over human beings. The archaeological distinction between the implements of the Bronze Age and the Iron Age was developed not so much in relation to means of production as it was to means of warfare (weapons) employed by the state. Moreover, by far the most important technology for ruling over people was the bureaucratic system. It is what frees people from personal relations and from relations of reciprocity. Likewise, an army becomes much stronger when it is organized into a chain-of-command system through the adoption of a bureaucratic order. This was also what made large-scale irrigation agriculture possible.

Kojin Karatani, *The Structure of World History*

NATURE AS RESOURCE

As early as 1530 the word "oeconomy," as employed in the title of Linnaeus' essay, was used to refer to the art of household management. Derived from the Greek word *oikos*, or house, it was eventually extended to mean the political administration of all the resources of a community or state for orderly production. Along another line of development, theologians had long made the Latin *oeconomia* interchangeable with God's "dispensations," and by the seventeenth century "oeconomy" was frequently employed to refer to the divine government of the natural world. God's economy was His extraordinary talent for matching means to ends, for so managing the cosmos that each constituent part performed its work with stunning efficiency. In 1658 Sir Kenelm Digby, who was active in promoting the growth of a natural science compatible with religion, was the first to speak of an "oeconomy of nature." Throughout the eighteenth century, the phrase incorporated portions of all these definitions to denote the grand organization and government of life on earth: the rational ordering of all material resources in an interacting whole. God was seen both as the Supreme Economist who had designed the earth household and as the housekeeper who kept it functioning productively.

Thus the study of "ecology"—a word that appeared in the nineteenth century as a more scientific substitute for the older phrase—was in its very origins imbued with a political and economic as well as Christian view of nature: the earth was perceived as a world that must be somehow managed for maximum output. This tendency to borrow heavily from politics and economics—their values along with their metaphors—is a crucial characteristic in the study of ecology.

Donald Worster, *Nature's Economy: The roots of Ecology*

The notion of a chain of being has been analyzed brilliantly by Arthur Lovejoy, but only as a metaphor of organic development in nature that later became influential in evolutionary theory. The infinitude of species ranged on an ascending ladder of nobility was more than a taxonomic system, however; it was also a description of ecological relatedness. The chain of being was a system of economic interdependence and mutual assistance. Even the most exalted creatures must depend upon those lower on the scale for their very existence; man and worm alike live to preserve each other's life. Richard Pulteney spoke of "that perfect order and just subordination of all the several parts of nature, by which they are rendered mutually subservient to the conservation of each other, and of the whole." That the natural economy had its interdependent social ranks and classes appealed to the naturalist as a firm guarantee against Hobbesian violence. But it also, in theory at least, ensured that all creatures in nature, great and small, were accorded some measure of safety and value. Each was granted a right to the resources it needed for survival. Human beings, to be sure, would need more than hedgehogs did for their self-fulfillment, just as lords and ladies required more than peasants did. But all had legitimate claims to make on the earth and on each other.[18]

Even when these rankings had been carefully described, however, there was a residuum of suspicion that perhaps Hobbes was right about nature after all. William Smellie, author of *The Philosophy of Natural History*, spoke fearfully of "the general system of carnage established by nature" in which "the weaker are uniformly preyed upon by the stronger." And Linnaeus, in his essay "The Polity of Nature," saw a nightmare of animals "not only gorging on the most beautiful flowers, but also mercilessly tearing each other to pieces"; the earth could suddenly appear to be, as he admitted, "a war of all against all."

NATURE AS RESOURCE

From an anthropologist's perspective, nearly everything touching on human interaction with the forest was also missing from the state's tunnel vision. The state did pay attention to poaching, which impinged on its claim to revenue in wood or its claim to royal game, but otherwise it typically ignored the vast, complex, and negotiated social uses of the forest for hunting and gathering, pasturage, fishing, charcoal making, trapping, and collecting food and valuable minerals as well as the forest's significance for magic, worship, refuge, and so on.[4]

If the utilitarian state could not see the real, existing forest for the (commercial) trees, if its view of its forests was abstract and partial, it was hardly unique in this respect. Some level of abstraction is necessary for virtually all forms of analysis, and it is not at all surprising that the abstractions of state officials should have reflected the paramount fiscal interests of their employer. The entry under "forest" in Diderot's *Encyclopédie* is almost exclusively concerned with the *utilité publique* of forest products and the taxes, revenues, and profits that they can be made to yield. The forest as a habitat disappears and is replaced by the forest as an economic resource to be managed efficiently and profitably.[5] Here, fiscal and commercial logics coincide; they are both resolutely fixed on the bottom line.

The vocabulary used to organize nature typically betrays the overriding interests of its human users. In fact, utilitarian discourse replaces the term "nature" with the term "natural resources," focusing on those aspects of nature that can be appropriated for human use. A comparable logic extracts from a more generalized natural world those flora or fauna that are of utilitarian value (usually marketable commodities) and, in turn, reclassifies those species that compete with, prey on, or otherwise diminish the yields of the valued species. Thus, plants that are valued become "crops," the species that compete with them are stigmatized as "weeds," and the insects that ingest them are stigmatized as "pests." Thus, trees that are valued become "timber," while species that compete with them become "trash" trees or "underbrush." The same logic applies to fauna. Highly valued animals become "game" or "livestock," while those animals that compete with or prey upon them become "predators" or "varmints."

The kind of abstracting, utilitarian logic that the state, through its officials, applied to the forest is thus not entirely distinctive. What is distinctive about this logic, however, is the narrowness of its field of vision, the degree of elaboration to which it can be subjected, and above all, as we shall see, the degree to which it allowed the state to impose that logic on the very reality that was observed.[6]

James Scott, *Seeing like a State*

NATURE AS RESOURCE

The classical logic of mode B relies on two basic conditions: that we may establish a cut that separates a part from its environment and that we may formulate consistently the property that unifies such parts. This entails an idea of ordering which, at its core, organizes social groups based on stable properties and parts of larger groups as part of a common order. The logical task which underlies the “legibility of the State” is then the question: how to define properties of parts such that order is guaranteed?

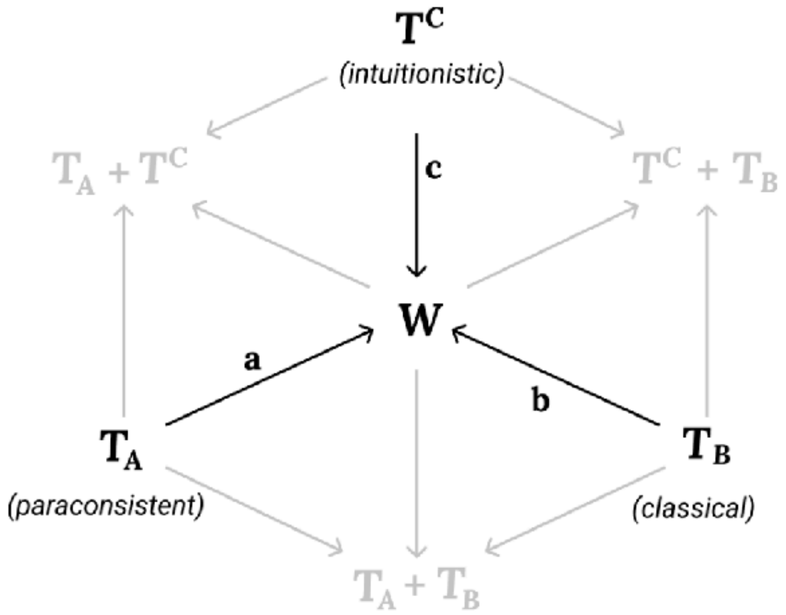
This is the question of hierarchy, of establishing orders of belonging, and, through it, a question of how to measure the relation, or situate the place, of a part in a whole. Chains of command, structures of domination, divisions between boss and functionaries – these are all examples of the double process of defining the boundaries of social groups in such a way that an ordering between them makes the place of each part legible with regards to the larger structure.

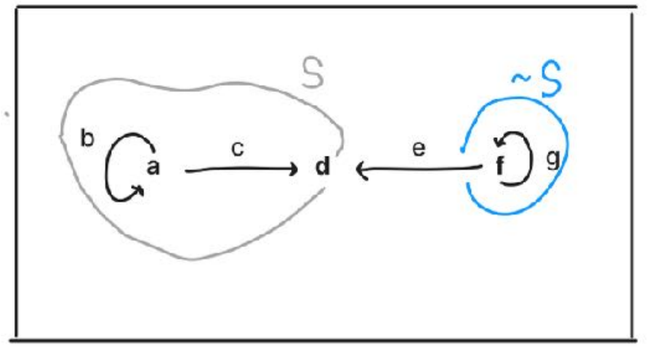
The process of creating a cut, allowing for a property to be defined, is – as Hobbes says – indifferent with regards to the means of obtaining the said separation: a social pact needs to be classical – it either exists or not – but it can be produced by common volition, as in a contract between two parties, or by violence, as in the case of plundering, enclosures, dispossession, etc.

A possible name for (1) a set that has identifiable properties and (2) is extractable or alienable from its surroundings - be it a human or a non-human part – is a **resource.**

Several aspects of the material support of social worlds can abide to the classical logic of mode B, specially those that have some functional closure, distinguishing recognizable *states of nature*: life and death of creatures, the stages of a crop, different classification of species, hierarchical dependency between living functions or parts of a natural environment, pronounced physical and physiological features – such as contrasting skin pigmentations or contrasting sexual chromosomes, etc. However, the need that materials be decomposed and recomposed as extractible sets, with no shared boundary or margin, also implies that the logic of property is constantly working against material tendencies of disorganization, interdependency and property gradients – hence the high and unrelenting logistical cost of maintaining roads, borders, population numbers, etc.

NATURE AS RAW MATERIAL





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NATURE AS RAW MATERIAL

With the application of natural forces to the production process, with the aid of natural science and technology, which is freely appropriated or has minimal costs that reduce the total production costs, it functions, Marx argues, in the same way as the social forces of capital attained through "the division of labor, cooperation, machinery." The forces of nature go into the labor process and work together with human labor power. Their appropriation appears as the productive force of capital because knowledge and the means of their application are monopolized by capital: "Science, generally speaking, costs the capitalist nothing, a fact that by no means prevents him from exploiting it. 'Alien' science is incorporated by capital just as 'alien' labor."[70] Even if they are not free, requiring some installation of machines or extra labor, new raw materials and auxiliary materials can reduce the constant part of the circulating capital and increase the productivity, so that the same amount of use value can be produced with lower costs. The "free natural power of capital" (land, wind, and water) and the availability of cheap raw materials and energy (wood, coal, and oil) exert a great influence upon the maximization of surplus-value.[71] Thus, this is yet another example of "how *use value*, which originally appears to us only as the material substratum of the economic relations, itself intervenes to determine the economic category."[72]

Kohei Saito, *Marx's Eco-socialism*

Without a doubt, capital is concerned about the material dimensions of the world. Natural resources are carefully and economically treated, insofar as they go into the valorization process, because their value must be transferred to new products without any loss.[73] "Economy" of constant capital is in this sense an immanent tendency of the capitalist mode of production, including today's popular idea of green capitalism, which is based on reduction of waste and recycling. Capitalist economies are "*economies in the creation of waste*, i.e., *reduction of refuse to a minimum*, and the maximum direct *exploitation of all the raw and ancillary materials that enter the production process*."[74] However, it is wrong to conclude from this description that according to Marx "this strong force will ultimately lead to a reduction of the production of waste by-products to zero."[75] Marx is neither so naïve nor does he believe that such a tendency is truly ecological. Recycling only occurs to the extent that it lowers production costs. Sustainable production is not an objective of these economies in the employment of capital. Insofar as massive commodity production and the squandering of free forces of nature continue under the capitalist system, there is no convincing reason to believe that capitalist production will become sustainable one day through economies of constant capital. Rather, with the development of productive forces under capitalism, the universal extravagant use of the forces of nature expands as capital pursues creating a "system of general utility" with lower costs.

NATURE AS RAW MATERIAL

We may call this *powerless power* – a cardinal doctrine of steam fetishism. Its attractiveness was a function of the glaring lack of submissiveness *among workers and in watercourses,* the former the social, the latter the natural contrast to steam. Not the least frequently, the engine would be held up as the antithesis of rowdy humans. In the first major biography of Watt published in English, François Arago, a French scientist and associate of the Royal Society of London, declared him 'the creator of six or eight millions of labourers, of assiduous and indefatigable labourers, *among whom the law will never have to suppress either combination or rioting;* of labourers working at wages of five centimes per diem', presumably the cost of coal. Calculations of how many acres of woodland the engines replaced were rare in the literature, for obvious reasons, but those of how many *workers* they equalled were all the more common.

So the capitalist cares naught for the material qualities of his goods: 'He does not manufacture boots for their own sake,' nor cutlery to put on his own table, nor houses to accommodate his children, but items to be sold to others. But he cannot sell *the idea* of boots or cutlery or houses. For his goods to attract demand, they must *be* such articles, endowed with a minimal use-value of allowing for walk on uneven terrain, scooping up food or shielding against cold and rain. To earn his profit, the industrial capitalist must take a detour through nature, setting up some version of 'the metabolic interaction [*Stoffwechsel*] between man and nature, the everlasting nature-imposed condition of human existence' within his precincts. Here the materials of nature are appropriated not for their own concrete comforts, but for the sole purpose of embodying exchange-value: 'Use-values are produced by capitalists only because and in so far as they form the material substratum of exchange-value, are the bearers of exchange-value.'[10]

The concept of 'material substratum' is crucial. A commodity commands exchange-value on the surface of the marketplace – and this is what counts for the capitalist – but it can never be severed from the layer beneath: if the labour expended in its production is subtracted, 'a material substratum is always left. This substratum is furnished by nature without human intervention.'[11] Whatever exchange-value is called forth on the premises of the capitalist, it has to rest on a bed of biophysical resources. Commodity production is the production of exchange-value *through nature,* with nature being precisely a substratum, subordinated and subsumed under a purely quantitative logic.

Andreas Malm, *Fossil Capital: The Rise of Steam-Power and the Roots of Global Warming*

AEI

Post

There Are No 'natural' Resources, Only Raw Materials – ALL Resources Are Created Through Human Effort

By Mark J. Perry

AEIdeas

June 22, 2013

Mark J. Perry

Senior Fellow Emeritus

Proc. Natl. Acad. Sci. USA
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Geophysics

Chemical composition of Earth, Venus, and Mercury

(planets/solar nebula/element abundances/mantle/core)

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*U.S. Geological Survey, National Center, Reston, Virginia 22092; and †Enrico Fermi Institute, University of Chicago, Chicago, Illinois 60637

Contributed by Edward Anders, September 15, 1980

ABSTRACT **Model compositions of Earth, Venus, and Mercury are calculated from the premise that planets and chondrites underwent four identical fractionation processes in the solar nebula. Because elements of similar properties stay together in these processes, five constraints suffice to define the composition of a planet: mass of the core, abundance of U, and the ratios K/U, Tl/U, and FeO/(FeO + MgO). Complete abundance tables, and normative mineralogies, are given for all three planets. Review of available data shows only a few gross trends for the inner planets: FeO decreases with heliocentric distance, whereas volatiles are depleted and refractories are enriched in the smaller planets.**

It has been known for over a century that the inner planets differ in density and, hence, in composition (1, 2). But a single characteristic, such as density, cannot constrain the abundance of 83 stable elements without additional assumptions. One fruitful assumption (3, 4) is that the planets formed by exactly the same processes as the chondrites, both being condensates from the solar nebula that experienced the same few fractionation processes (5). In chondrites, elements of similar cosmochemical properties are fractionated by similar factors, and they divide into five groups on this basis. If this is also true for planets, then we only require the abundances of five "index elements"—one for each group—in the planet to calculate the abundances of all 83 elements.

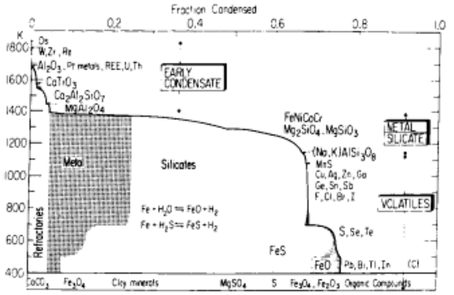


FIG. 1. Condensation of solar gas at 10^{-4} atm (10.1 Pa). Three types of dust condense from a solar gas: an early condensate consisting of refractory minerals, metallic nickel-iron, and magnesium silicates (21, 22). On cooling, iron reacts with H_2O and H_2S to give FeO and FeS. At this point, the mineral assemblage resembles that of the ordinary chondrites and inner planets. Major changes occur below 400 K, yielding a carbonaceous chondrite mineral assemblage.

metal reacts with H_2S and H_2O to form FeS (a fourth component) and FeO, which somehow entered the Mg silicates.

1. WORLDS
2. SOCIAL WORLDS
3. MODES OF INTERCOURSE
4. THE APPEARANCES OF NATURE

NATURE AS RAW MATERIAL

The open structure of value, the fact socially existing entities have margins rather than cuts or boundaries, can be understood by realizing that mode C functions via a logic of destruction and construction: any part that can be destroyed – in the sense of losing its current form, but remaining materially relevant to value – and then employed constructively – that is, as part of a stepwise procedure built out of the available material – can be evaluated.

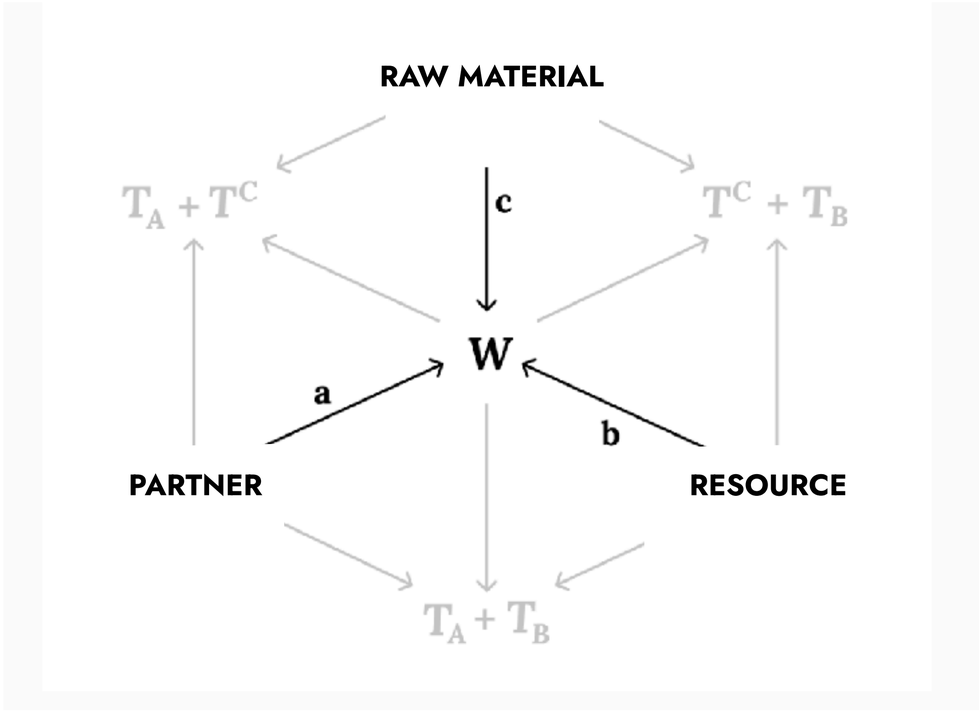
Such logic is open in at least two senses. First, it is constructively open, in that if we only deem to exist what is explicitly constructible, then the difference between what we can construct as ours, and what we can construct as not-ours *leave a margin open*. To redo work procedures such that labor might be more intense, more efficient, optimizing time and value, is a way to explore the useful margins of commodities – both means of production and labor-power itself – and is one of the main sources of surplus-value. The second it is destructively open, in that a given commodity can be broken into previously unaccessible parts, finding new lower-scale properties that might allow for new types of construction. Again, it is a type of use margin, driven towards new material affordances, that allows value to exploit people and things – it even offers a definition of exploitation: the search for affordances beyond an object's form.

The difference between technology and technics is also clarified in this way: while technique is a constructive procedure combining available human and non-human forms, technology implies the introduction of previously unavailable aspects of the material support in the production of some active effect. Hence a pulley uses the weight of a rock and the already available affordances of wheels to reduce work, while a steam engine extracts from water an unavailable property - exerting pressure through being heated - in order to perform mechanical work.

A possible name for a substrate that (1) has no definitive properties, being open to decomposition and (2) determines the available means of a procedure – is **raw material.**

Part of the apparent universal power of value to capture any material support into its logic derives from the fact it resonates well with physical reality, which is filled with structures that draw macro-properties from lower-level interactions (thermodynamics) and with flows of energy that prevent the formation of closed systems, through entropy above all. The possibility to *store dead labor* on objects, as they acquire specific technical functions, as well as the general passivity of means of production to the procedures that mobilize them, demonstrate that, for mode C, nature is "raw material" not in the sense of "pre-processed" matter, but of a substrate devoid of inherent form.

THE APPEARANCES OF NATURE



THE APPEARANCES OF NATURE

Social formation	Logical layering	Natural relations	Descola's Categories	Socially effective form of activity	Basic technological transformation
T^{A}_{CB}	Partner Raw Material Resource	Other creatures are like us, we have different uses for each other – possession is held in check.	Animism	Interactive (actor)	Domestication
T^{A}_{BC}	Partner Resource Raw Material	Some other creatures are like us, others are not – this is distinguished by shared properties.	Totemism		
T^{B}_{AC}	Resource Partner Raw Material	No creature is like any other, but this difference can be ordered in a chain or hierarchy – the use of one to another is very similar	Analogism	Functional (profession)	Agriculture
T^{B}_{CA}	Resource Raw Material Partner	The ordering of creatures is determined by their functional freedom, with the most resourceful at the top			
T^{C}_{AB}	Raw Material Partner Resource	The common feature of all creatures is that they are made of the same stuff, their differences come from their more or less constituted cultures or groups	"Naturalism"	Energetic (work)	Fuel
T^{C}_{BA}	Raw Material Resource Partner	The common feature of all creatures is that they are made of the same stuff, but there is no common culture to bind them other than functional properties			

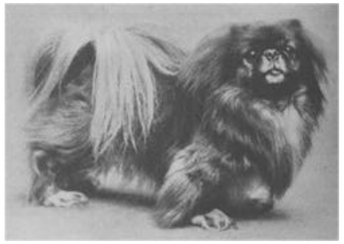
HISTORY OF THE DOG

Saudi Arabia, 8kya

China, 6kya

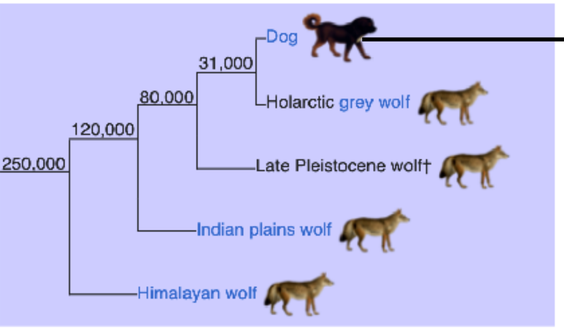
"The Kennel", 1406

"A distinguished member of the Humane Society", 1831



Pekinese Dog, 1907

Phylogenetic tree for *Canis lupus* with timing in years[a]



France, 17kya

"Beware of the dog"
Pompeii, 4kya

George Romney "Lady Hamilton (as Nature), 1782

"Dog fashions", 1889

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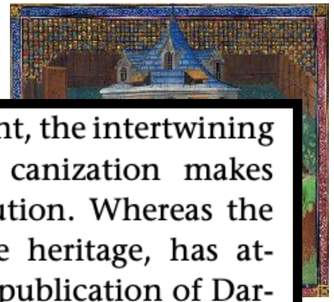

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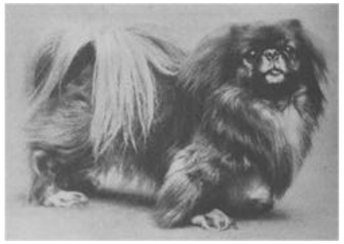

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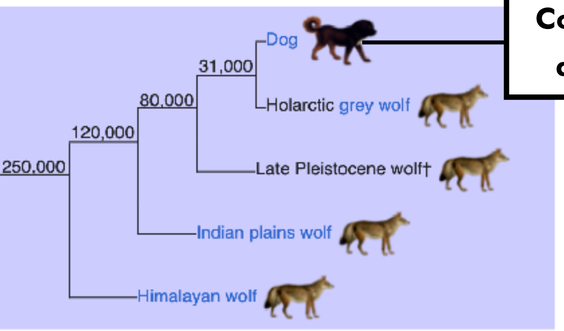

Co-evolution and domestication

From a biologist's vantage point, the intertwining process of hominization and canization makes sense only if viewed as coevolution. Whereas the evolution of man, our primate heritage, has attracted attention ever since the publication of Darwin's *The Descent of Man*, the evolution of wolves and dogs has remained a particular topic for paleontologists specialized in Pleistocene carnivores. *The descent of dogs,* to the best of our knowledge, has not been integrated into the descent of modern hominids. Consequently, we may ask: What was the state of affairs among our ancestors when some wolves separated from their conspecifics and became the immediate precursors of dogs?

George Romney "Lady Hamilton (as Nature), 1782

"Dog fashions", 1889

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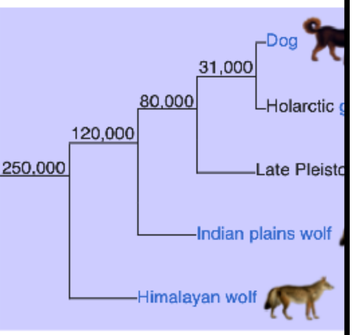
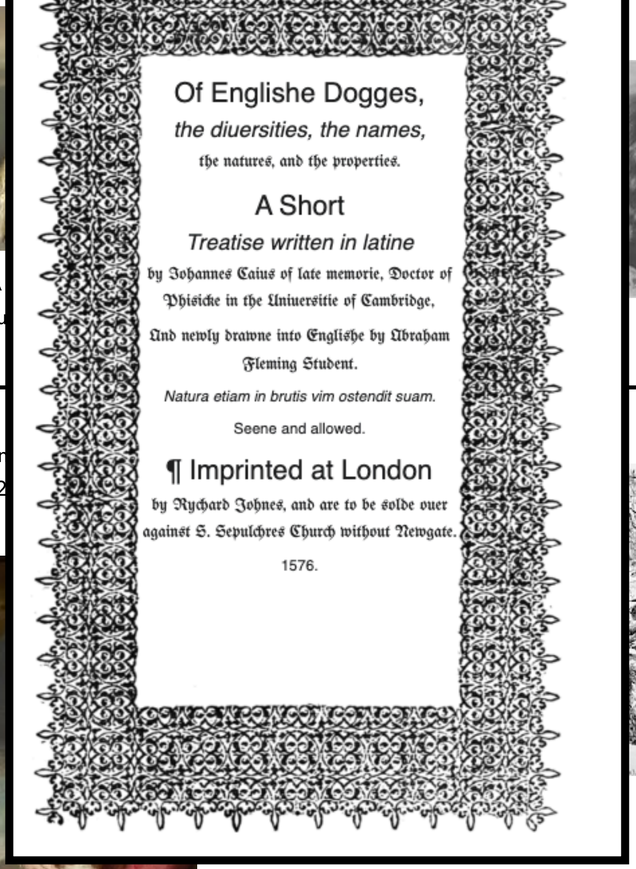


dogs — Johannes Caius's *Of Englishe Dogges*, which appeared in 1576.[26] (It was a translation of a Latin treatise originally published in 1570.) Dr. Caius's list of Tudor dog types was meant to be exhaustive — he compiled it as a favor to his contemporary Konrad Gesner, the Swiss author of the compendious *Historia animalium* — and it bears little resemblance to modern schemes of classification. Caius recognized only sixteen varieties, far fewer than existed in the nineteenth century: "Terrare, Harier, Bludhunde, Gasehunde, Setter, Water Spainel or Fynder, Spainel-gentle or Comforter, Shepherd's Dog, Mastive or Bande-Dog, Wappe, Turnspit, Dancer."[27] Some of these names anticipated those of nineteenth-century breeds, but it is unlikely that they referred to identical, or even very similar animals.

Caius's classification was based on function rather than physical appearance. He grouped his types under three larger categories, all unmistakably utilitarian: hunting dogs, pet dogs (this category included only the spainel-gentle), and dogs that did menial work. Any large dog would have been called a mastive; any lapdog a spainel-gentle. A dog that chased hares was a harier; one that helped the cook was a turnspit.

Functional classifications



Of Englishe Dogges,
the diuersities, the names,
the natures, and the properties.

A Short
Treatise written in latine
by Iohannes Caius of late memorie, Doctor of Phisicke in the Uniuersitie of Cambridge,
And newly drawne into Englishe by Abraham Fleming Student.
Natura etiam in brutis vim ostendit suam.
Seene and allowed.

¶ Imprinted at London
by Rychard Iohnes, and are to be solde ouer against S. Sepulchres Church without Newgate.
1576.

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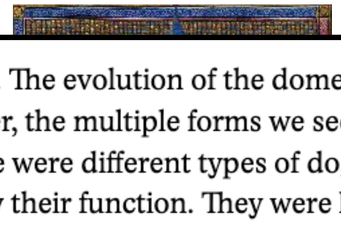

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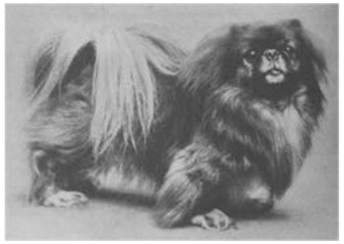
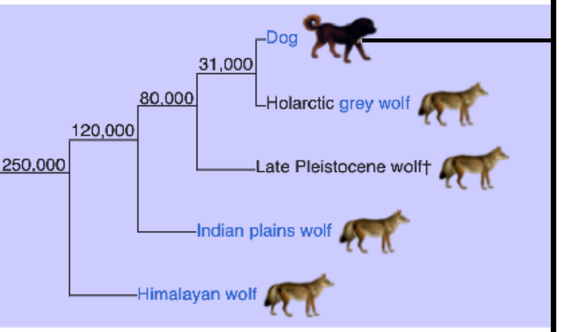


Pekinese Dog, 1907

Victorian Explosion
circa 1850

Phylogenetic tree for *Canis lupus* with timing in years[a]



Modern dog breeds were created in Victorian Britain. The evolution of the domestic dog goes back tens of thousands of years – however, the multiple forms we see today are just 150 years old. Before the Victorian era, there were different types of dog, but there were not that many, and they were largely defined by their function. They were like the colours of a rainbow: variations within each type, shading into each other at the margins. And many terms were used for the different dogs: breed, kind, race, sort, strain, type and variety.

By the time the Victorian era came to an end, only one term was used – *breed*. This was more than a change in language. Dog breeds were something entirely new, defined by their form not their function. With the invention of breed, the different types became like the blocks on a paint colour card – discrete, uniform and standardised. The greater differentiation of breeds increased their number. In the 1840s, just two types of terrier were recognised; by the end of the Victorian period, there were 10, and proliferation continued – today there are 27.

ns", 1889

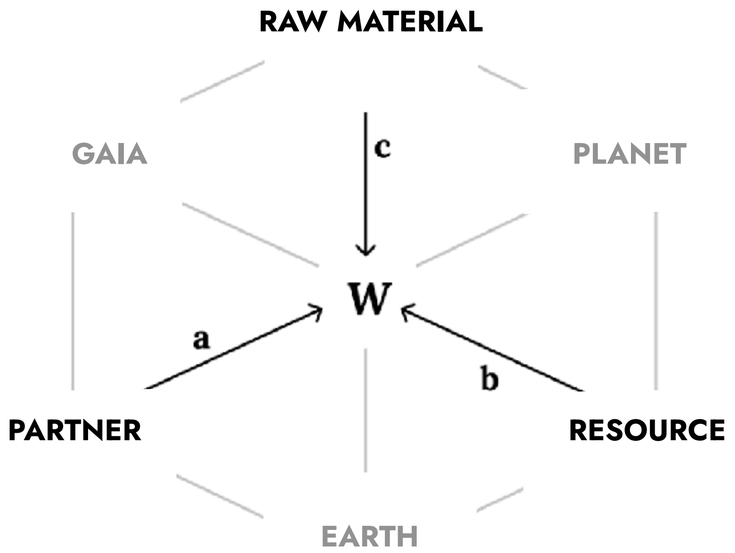
Lady Hamilton (as

1. WORLDS
2. SOCIAL WORLDS
3. MODES OF INTERCOURSE
4. THE APPEARANCES OF NATURE

COUNTERING APPEARANCES

We are no longer dealing (only) with a wild and threatening nature, nor with a fragile nature to be protected, nor a nature to be mercilessly exploited. The case is new. Gaia, she who intrudes, *asks nothing of us*, not even a response to the question she imposes. Offended, [2] Gaia is indifferent to the question "who is responsible?" and doesn't act as a righter of wrongs – it seems clear that the regions of the earth that will be affected first will be the poorest on the planet, to say nothing of all those living beings that have nothing to do with the affair. This doesn't signify, especially not, the justification of any kind of indifference whatsoever on our part with regard to the threats that hang over the living beings that inhabit the earth with us. It simply isn't Gaia's affair.

Isabelle Stengers, *The intrusion of Gaia*



To say that the Earth is a human planet becomes truer every day. Humans are made from the Earth, and the Earth is remade by human hands. Many earth scientists express this by stating that the Earth has entered a new geological epoch: the Anthropocene, the Age of Humans.

As scholars, scientists, campaigners, and citizens, we write with the conviction that knowledge and technology, applied with wisdom, might allow for a good, or even great, Anthropocene. A good Anthropocene demands that humans use their growing social, economic, and technological powers to make life better for people, stabilize the climate, and protect the natural world.

An Ecomodernist Manifesto

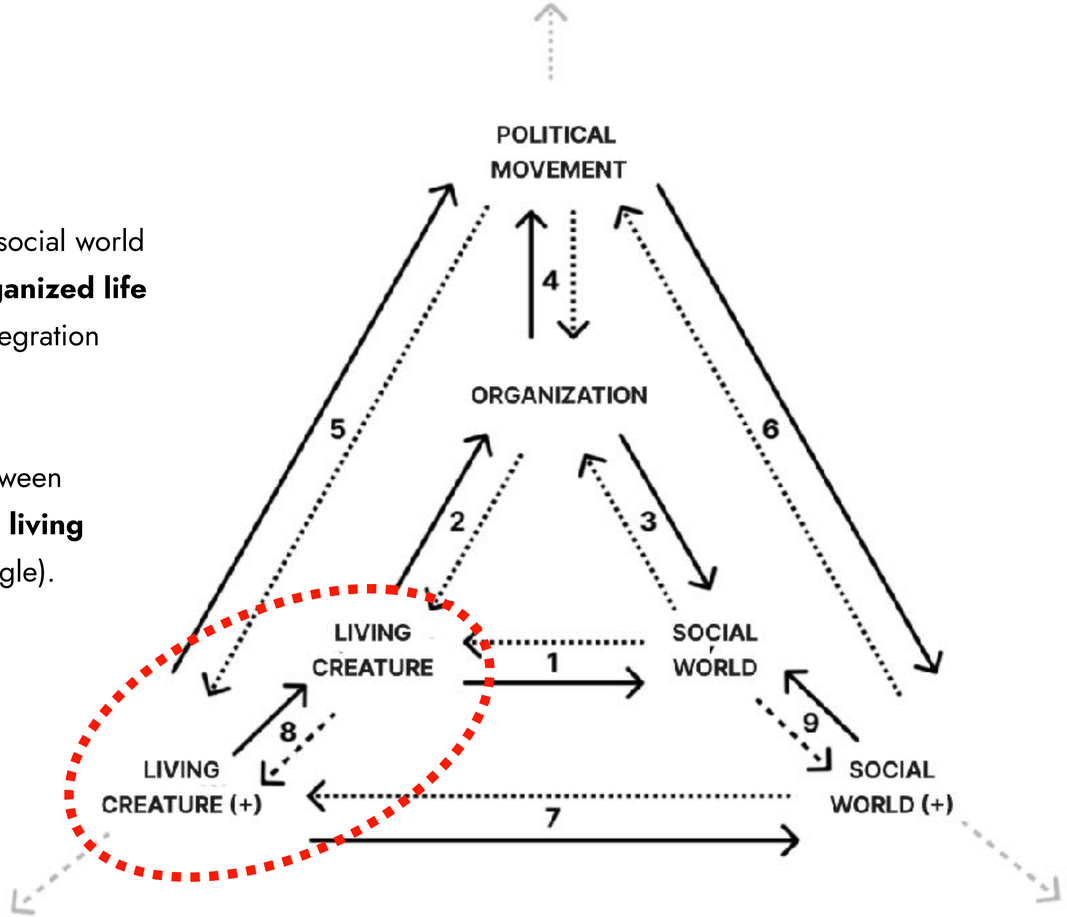
The Earth qua Earth manifests itself each time *all* beings, even those that have not mutually selected each other as conditions of life, are at least virtually put in relation to one another in ways that completely cut across the logic of ecosystems. This is the case for instance when our carbon emissions indirectly affect the Venezuelan tepuis, since we are not part of their ecosystem in any sense, those impressive geological formations being isolated from their surrounding environment by steep cliffs, and some of them having never been visited by any human being.[5] This sort of event is rather rare in the history of the planet, but it is only through such events that something like the Earth manifests itself. In the past this may have required the eruption of a supervolcano or the impact of an asteroid; today the Earth is awakened by the advent of carbon civilization. Each time an event elicits not only a modification of a state of affairs but also a supplementary chain of reactions that potentially affects *all* the beings of the planet, the Earth itself is manifested as an actor.

Patrice Maniglier, *How many Earths?*

THE NATURE OF POLITICS

We define politics as situated reorganizations of the social world such that the integration of **living creatures** into **organized life** leads a perspective irreducible to that of its direct integration into the **social world.**

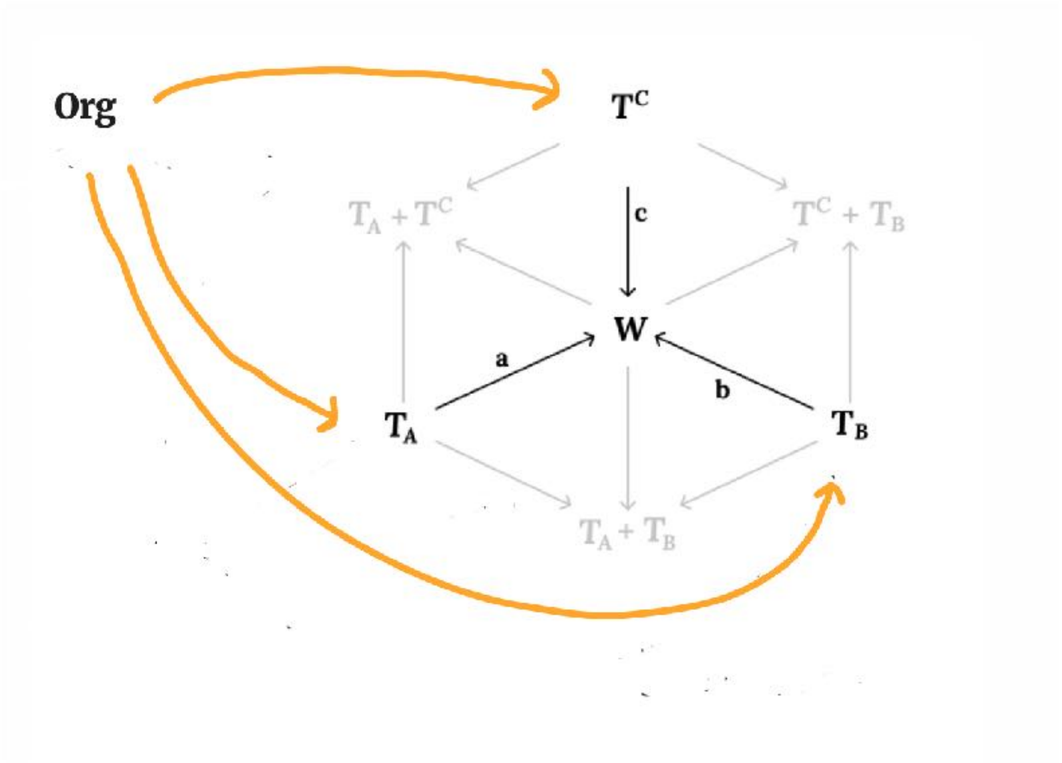
When this is the case, a difference is established between **surviving** (when the internal triangle commutes) and **living** (when it is projected onto the larger commuting triangle).



THE NATURE OF POLITICS

We can use our theory of the natural dimension of social worlds to give further contours to **Org**. We can define that (1) **Org** should concern exclusively social worlds, and that, therefore, (2) social atoms mobilized by **Org** need to have a natural support. This allows use to restrict the idea of the "space of all possible forms of organization" to the (still infinite) space of possible forms of organization that have real atoms "propagatable" by natural substrates. **Org** is thus restricted to be the space of "**materializable" organizations.**

This means that not every sketch of how to combine people into groups is (1) social – since our definition of social worlds implies a certain connection with social reproduction – or (2) political – since new forms that cannot propagate through non-social substrates cannot subsume the reproduction of living systems. Forms of negation or subversion of **W** that do not rely on any material to propagate themselves – therefore going against human capacity, non-human technical and ecological means – are, at best, **weakly singular:** they point to the novelty in **Org**, but they can't impose a new structure on **W**. This allows us to remove from **Org** purely destructive political forms that undermine their own social reproduction.



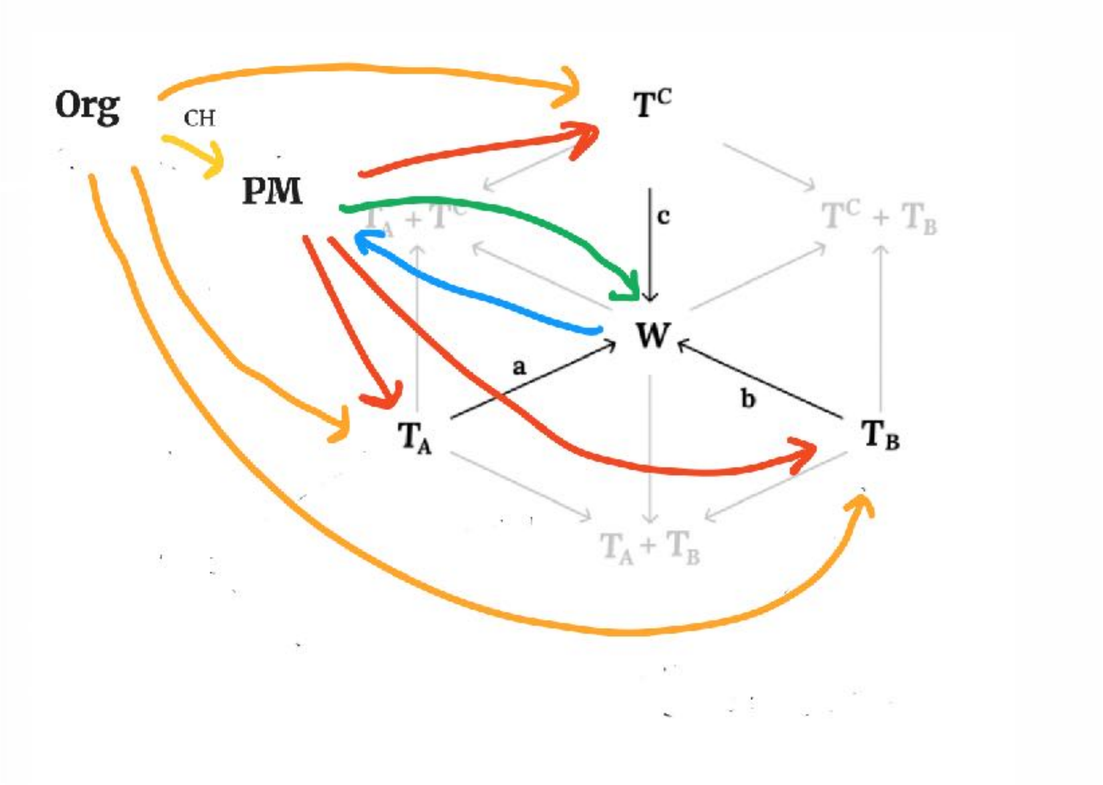
THE NATURE OF COMMUNISM

Following a recent correction of our diagram, we distinguish here **Org** as "the space of materializable organizations" from **PM** – or political movement – as "the space of composable political experiments in **W**". In this new schema, the communist hypothesis (**CH**) is no longer a "standpoint", but the affirmation of a connection between the really existing political movement **PM** and the broader standpoint of all materializable organizations.

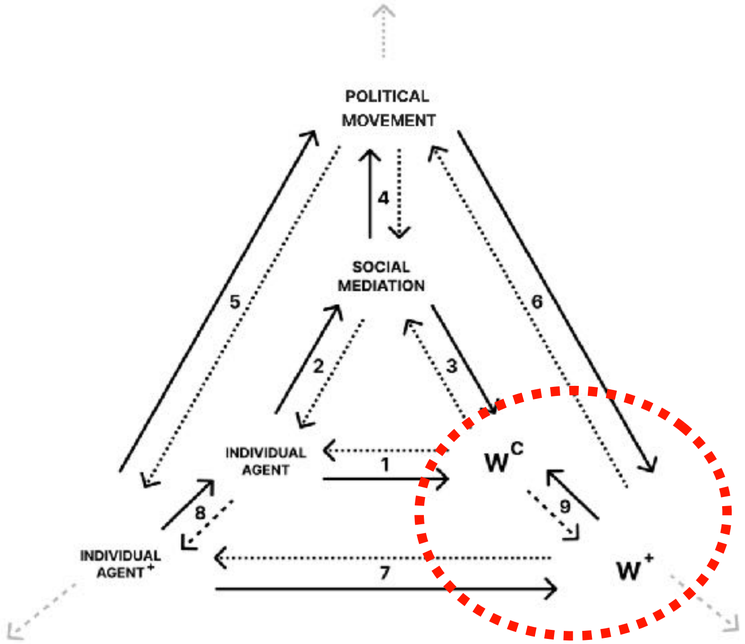
Follow the sources and targets of arrows:

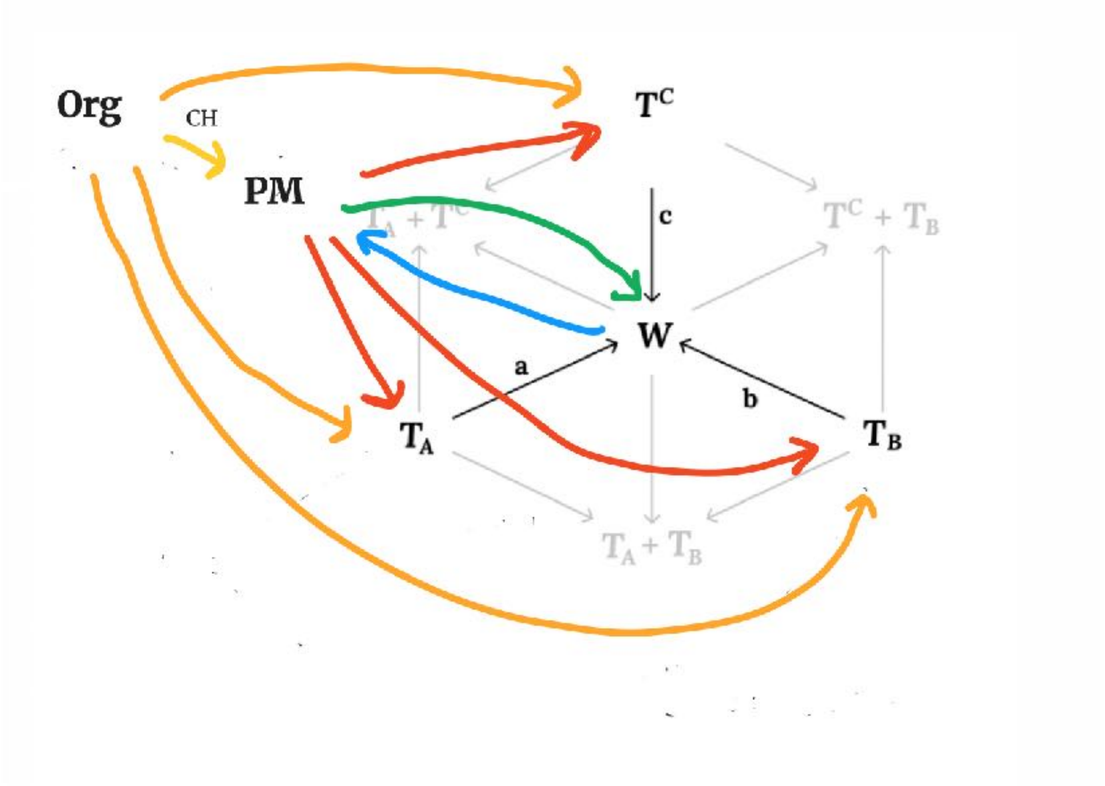
1. For **W**, **T** are the irretrievable sources of its composition.
2. For **PM**, **W** is a retrievable source, and **Org** and irretrievable one
3. For **T**, **PM** is a retrievable source and **Org** and irretrievable one.
4. For **Org**, everything else has a source.

Given the diverse determinations of **PM** and **W**, the arrows between them do not form an isomorphism – they determine the state of struggle in the world at a given moment.



THE NATURE OF COMMUNISM





While **Org** is in fact (immeasurable) larger than **W**, **PM** is larger than **W** by the measure of *how much the communist movement effectively exists*, that is, by the measure of the distance between **W** and **W+**. The communist hypothesis (**CH**) can therefore be stated as: "**we can measure "Org < W" via W+, or W(PM)"**

Some of the consequences of further developing the theory of real social atoms, that is, of nature:

(1) We can restrict what we mean by the "organizational point of view" of Org to something closer to Bogdanov's own view, namely, restricting mathematical forms to those that have material realizability through non-social means (that is, that are propagatable through a natural substrate).

(2) We can distinguish between new political forms that can emerge within a social space, subverting its logic, but which cannot propagate themselves — they are singular, but inconsequential under a relevant scale — hence weakly singular, from new political forms that can explore material dynamics in human and non-human substrates to effectively contribute to new forms of social reproduction.

(3) We can show that there is a distinction between survival and living which is imminently political: to live is to be part of reorganizations of the world that could lead to new forms of social reproduction, to survive is to be integrated into forms of social reproduction that merely conserve the logic of the world.

Platonov deserves a special attention in this respect. In his writings, it is not only human beings but all living creatures, including plants, that are overwhelmed by the *desire for communism*, a desire which, as Fredric Jameson has pointed out, has still not found its Freud or Lacan (Jameson 1994: 97).[6] A passage from *Chevengur* (1928–1929) is emblematic in this regard: 'Chepurny touched a burdock – it too wanted communism: the entire weed patch was a friendship of living plants […]. Just like the proletariat, this grass endures the life of heat and the death of deep snow' (Platonov 1978: 198).

Timofeeva, *History of Animals*

In the morning a dog came fearfully to the rubbish pit, like a beggar woman. On seeing the dog, Lichtenberg immediately understood that it was a former man who had been reduced by grief and need to the senselessness of an animal, and he did not frightened it any more. But the dog began to tremble with horror as soon as it noticed the man; its eyes moistened over with deathly sorrow; terror sapped its strength and it was only with difficulty that it vanished. (Platonov 1999: 79)

Platonov, *Rubbish Wind*

As he came to the dried-up bed of the Kunya-Darya, Nazar Chagataev saw a camel sitting like a human being, propped up on his front legs in a drift of sand. He was thin, his humps had sagged, and he was looking shyly out of black eyes, like a sad and intelligent human being. … The camel then closed his eyes, because he did not know how he was meant to cry. (Platonov 2008: 26)

Platonov, *The Soul*

Nature is not great, it is not abundant. Or it is so harshly arranged that it has never bestowed its abundance and greatness on anyone. This is a good thing, otherwise – in historical time – all of nature would have been plundered, wasted, eaten up, people would have revelled in it down to its very bones; there would always have been enough appetite. If the physical world had not had its one law – in fact, the basic law: that of the dialectic – this would have sufficed for people to have destroyed the world completely in a few short centuries. More: even without people, nature would have destroyed itself into pieces of its own accord. The dialectic is probably an expression of miserliness, of the daunting harshness of nature's construction, and it is only thanks to this that the historical formation of humankind became possible …

Platonov, *The Socialist Tragedy*

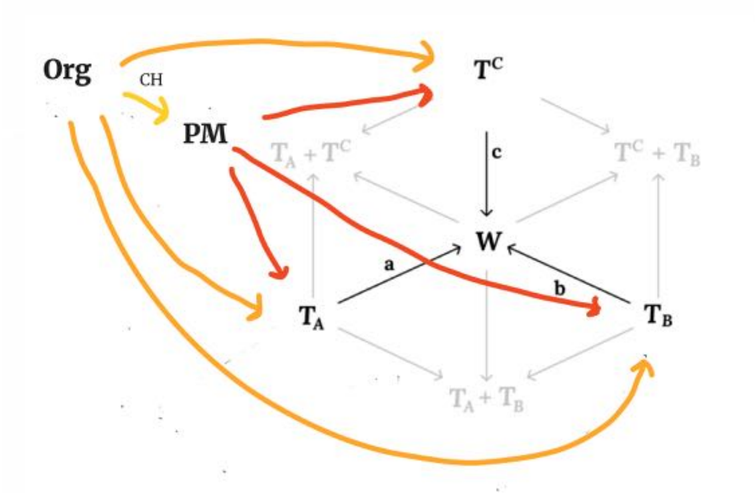
SOLDIER:
O cows, I had a dream.
I slept, wrapped up in sheepskins,
And the skies opened to reveal
A large animal institute.
There life was always full of health.
At the center of the edifice
A stately cow stood in the wreath
Of incomplete consciousness.
Goddess of cheese, goddess of milk,
Touching the ceiling with her head,
She modestly covered herself with a nightshirt
And squeezed her breasts into a barrel.
With loud banging, ten thick streams
Fell on the cold metal,
And, readied for commercial freight,
The pail sounded like music,
As the enthusiastic cow,
Pressing her hands to her chest,
Stood there, ready for the challenge
Of raising her consciousness.

HORSE:
Bravo, bravo!
This fellow has more lies than a library!
But sweet is the poison you speak,
And your damn ravings eat at my heart.
Soldier! We go naked and barefoot.
Plows crush us, bees sting us,
Our minds are like huts in the slum,
Our tails drag through the dust.
Soldier, during your midnight vigils,
In the smoke of the autumn evening,
Haven't you ever heard an ox
Fighting for breath in your heavy stocks?
We have no rights before the law,
The plow calls us and next the grave.
Death is the only state we know
That welcomes us as refugees.

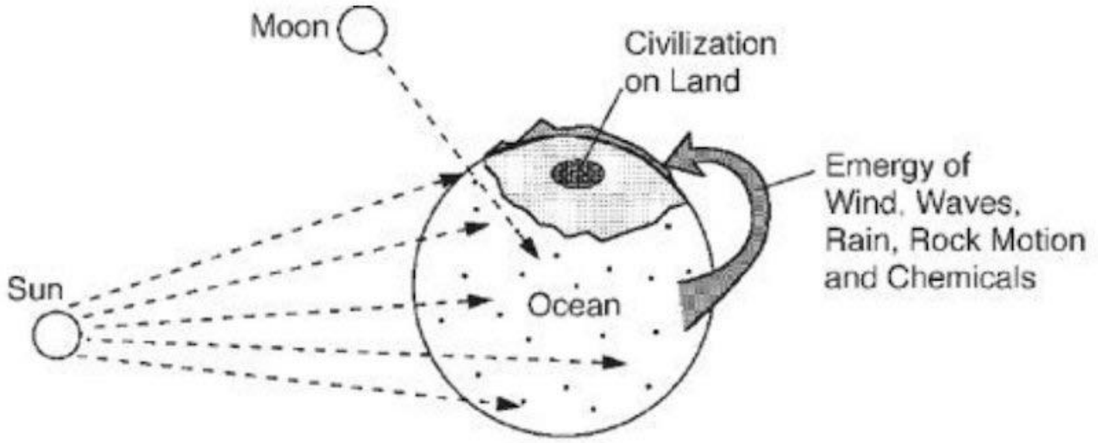
SOLDIER:
Shame, horsey! What's come over you?
You hardly know what you are saying.
Look, what is that thundering thing
That crawls from out behind the mountain to
replace you?
Huge, two-storied, made of iron,
With an iron mug in flames,
He crawls towards us, thundering. He is
Indefatigable as warrior against nature
And fights her in the field hand to hand.
So—courage, O intelligent cows,
Courage, O horses, bulls, courage!
From now on you'll be healthy, fit.
We'll build you shelters here with heaping
Platters of assorted feed.
We'll crush the monarchy of plows,
We'll raze the old world to the ground,
And for the first time the letter A
We'll say together and very loud.

The far-off forest roared
A dull roll of the letter A
As, clanging, the tractor crawled out
Smashing through centuries with its face.
And the crowds of feeble animals,
Fallen into dust and ash,
Looked up with dry primeval eyes
At the new face of the earth.

Zabolotsky, *The Triumph of Agriculture*



The organizational point of view is to the social world…



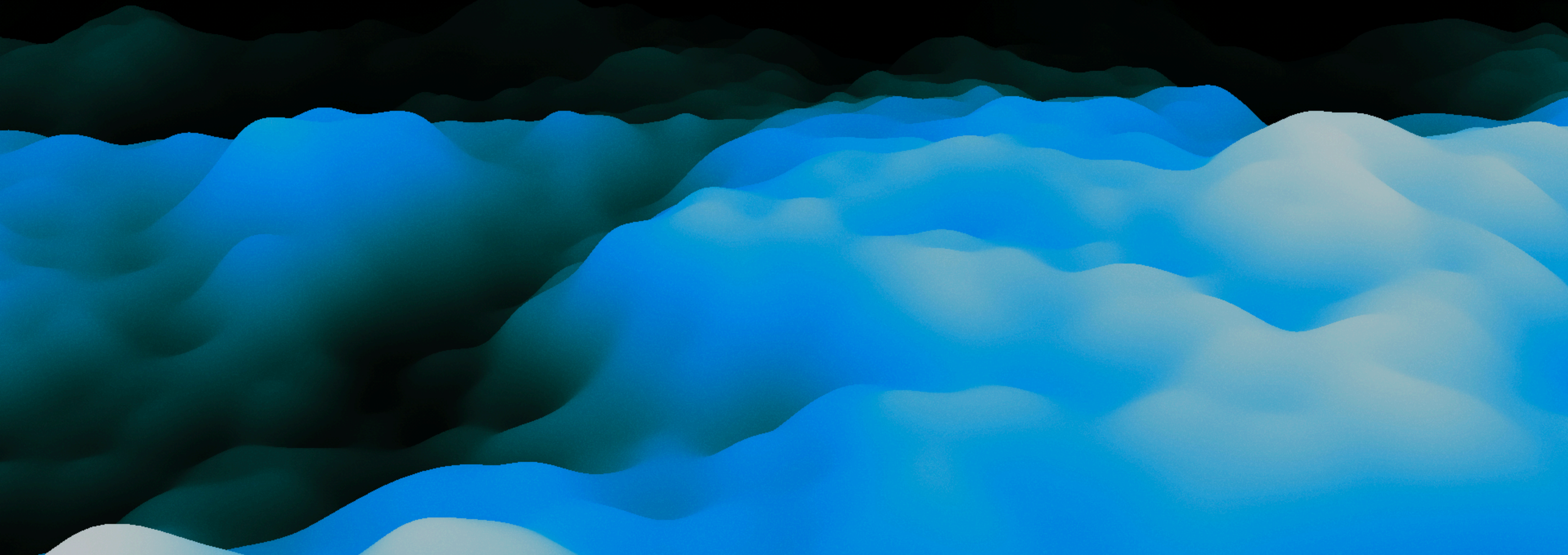
…. how the sun is to the earth.

The sun provides not only the power of being seen for things seen, but, as I think you will agree, also their generation and growth and nurture, although it is not itself generation... Similarly with things known, you will agree that the good is not only the cause of their becoming known, but the cause that they are, the cause of their state of being, although the good is not itself a state of being but something transcending far beyond it in dignity and power.

Plato, *The Republic VI (509b)*

ENVIRONMENTAL LOGIC, 2

WHAT IS A SOCIAL ENVIRONMENT?



ENVIRONMENTAL LOGIC, 1

ON THE CONSTITUTION OF NATURE THROUGH SOCIAL MODES OF INTERCOURSE

ENVIRONMENTAL LOGIC, 1:
HOW IS NATURE CONSTITUTED IN SOCIAL WORLDS?

ENVIRONMENTAL LOGIC, 2:
WHAT IS A SOCIAL ENVIRONMENT?

ENVIRONMENTAL LOGIC, 3:
WHAT IS THE LOGIC OF COMMUNIST TRANSITION?

1. WORLDS
2. SOCIAL WORLDS
3. MODES OF INTERCOURSE
4. THE APPEARANCES OF NATURE

ENVIRONMENTAL LOGIC, 1:
HOW IS NATURE CONSTITUTED IN SOCIAL WORLDS?

1. WORLDS
2. SOCIAL WORLDS
3. MODES OF INTERCOURSE
4. THE APPEARANCES OF NATURE

1. ENVIRONMENT
2. SOCIAL ENVIRONMENT
3. ECONOMIC COMPULSION
4. SOCIAL STRATEGY

1. ENVIRONMENT
2. SOCIAL ENVIRONMENT
3. ECONOMIC COMPULSION
4. SOCIAL STRATEGY