Earth Collective

Natural Conditions for a Transindividual Politics

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The concept of a transindividual relation has been articulated in order to resolve the problem of the unity of individuals in association with others. More particularly, it has been offered as a route for overcoming a disjunctive tendency whereby *either* individuality is lost to an encompassing collective, *or* the substance of the individual renders the collective accidental, optional, or a mere semblance. Transindividuality thus offers a way to think individuals and collectives thereof as relative, mutually dependent and constitutive, whilst maintaining a separation between the two. Equally, it affords a conception of a collective which is more than the sum of its parts, or an arbitrary aggregate of beings.

Whilst this abstract description of transindividuality might appear apt for ecological or earth systems analysis, to date this has not been attempted. Neither of the two most significant thinkers of transindividuality, Gilbert Simondon and Étienne Balibar, broach the question of a natural transindividual at any length, nor do the various monographs and special editions of journals which have been dedicated to extending and criticising the former authors' analysis of transindividuality. As such, this article addresses this lacuna through discussion of the problem of natural transindividuality, claiming that mutual dependency and constitution between individuals and collectives pertains to geophysical and vital relations as much as it does to human social relations.

Keywords: Simondon, Balibar, Transindividual, Gaia, Ecology.

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Seldom, if ever, does nature operate in closed and separate compartments.

Rachel Carson, *Silent Spring*[1]

The concept of a transindividual relation has been articulated in order to resolve the problem of the unity of individuals in association with others. More particularly, it has been offered as a route for overcoming a disjunctive tendency whereby *either* individuality is lost to an encompassing collective, *or* the substance of the individual renders the collective accidental, optional, or a mere semblance. Transindividuality thus offers a way to think individuals and collectives thereof as relative, mutually dependent and constitutive, whilst maintaining a separation between the two. Equally, it affords a conception of a collective which is more than the sum of its parts, or an arbitrary aggregate of beings.

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[1] R. Carson, *Silent Spring*, Houghton Mifflin, Boston 1962, p. 52.

[2] Both reviewers of Jason Read's *The Politics of Transindividuality* note that the absence of non-human transindividuality is a problem for thinking transindividuality politically (see T. Stolze, *Jason Read: The Politics of Transindividuality* [review], in "Hum Stud", 40 (2017), pp. 707-711; D. Wall, *Jason Read: The Politics of Transindividuality* [review], in "Marx and Philosophy" (2018). Available at: https://marxandphilosophy.org.uk/reviews/15539_the-politics-of-transindividuality-reviewed-by-derek-wall). On political transindividuality, see also: B. Aspe, *Simondon, politique du transindividual*. Dittmar, Paris 2013; A. Bardin, P. Rodriguez, *A Vindication of Simondon's Political Anthropology*, in "Australasian

through discussion of the problem of natural transindividuality, claiming that mutual dependency and constitution between individuals and collectives pertains to geophysical and vital relations as much as it does to human social relations.

This involves first, a discussion of Simondon's conception of relational individuality and his contention that only psychical individuations relate to a collective and are thus said transindividual. The preclusion of physical and vital collectives, and thus also transindividuality, is discussed in part as a consequence of the indeterminacy of Simondon's concept of the milieu to which individuals relate. Although the term is consistently used and apparently universal to individuals, the nature and makeup of milieux is rarely thought through, and never in appropriate detail. Equally, it is argued that the concepts of multiplicity applied to the vital in place of transindividual and collective - 'pure social' and 'inter-individual' – are incompatible with cohesive groups or collectives of physical and vital beings, such as ecosystems. Against Simondon it is thus contended that transindividual relations between individuals and collectives should apply equally to the physical, vital and psychic, and that further determination of the concept of milieu necessitates this.

Second, Balibar's conception of transindividuality is discussed, paying particular attention to his metabolic description of the interdependency between individual and collective, through 'integrative' and 'regulative' causalities. In this it is argued that Balibar's conception of transindividuality offers a resource for thinking natural relations, particularly in the terms of Gaia theory. However, if Simondon immunises transindividuality from non-human relations, actively limiting its scope, Balibar instead leaves this aspect largely unexplored, with analysis to date remaining limited to human social relations. The criticisms levelled at both thinkers are thus quite different. Regarding Simondon the claim is stronger, emphasising the impossibility of physical and vital collectives, in direct contrast to the claim of this article. Regarding Balibar, on the contrary, the intention is primarily to explore the possibility of a critical *extension* of his conception of transindividuality to the earth system.

This latter task is then undertaken in the final section, which offers a sketch of a natural transindividuality through consideration of the earth system or Gaia. In this way, James

Philosophical Review", 2/1 (2018), pp. 54-61; M.G. Kelly, D. Vardoulakis (eds.), "Australasian Philosophical Review", 2/1 (2018).

Lovelock's and Lynn Margulis' hypothesis for a self-regulating earth system is discussed in light of the discussion of transindividuality, as an example of relations of mutual dependency and constitution between individuals and collective, and as an example of the integrative and regulative causalities articulated by Balibar[3].

'Milieu' and 'transindividual' in Simondon's philosophy of individuation

Individuals, for Simondon, are both genetic and relational. Individuals are thus never complete, but always changing or individuating, and equally, individuals exist in relation to a milieu. The problem of transindividuality primarily pertains to the latter, the sense in which individuals are relative. But whilst one might expect that this means that for Simondon all individuals must be transindividual, existing in an interdependent relation with a collective thereof, in fact he restricts transindividuality to psychic relations.

Although only some individuals relate to a collective, all individuals (or individuations) relate to a 'milieu', and must do so in order to sustain individuation or to continue to exist (which is to say the same thing). Relations are necessary for individuals, and Simondon thus inverts Descartes definition of a substance, as something "having no need for any other thing in order to exist", to contend that individuations need another in order exist[4]. The 'other thing' which the individual relates to, then, is a milieu[5]. Simondon uses a variety of terms to describe the energetic systematic conditions required for individuation – such as potential energy, metastability, homeostasis – which are ultimately derived from a milieu. And he makes it plain that individuals must relate to a milieu as a systematic source of potential energy, and for some individuals as that through which they orientate themselves.

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[3] J. Lovelock, L. Margulis, L. *Atmospheric homeostasis by and for the biosphere: the gaia hypothesis*, in "Tellus", 26/1-2 (1974), pp. 2-10.

[4] Simondon writes that "the reality of potential energy is not that of an object or a substance consisting in itself and "having no need of anything else in order to exist [*n'ayant besoin d'aucune autre chose pour exister*]" (G. Simondon, *Individuation in Light of Notions of Form and Information*, University of Minnesota Press, Minneapolis 2020, p. 56 [*L'individuation à la lumière des notions de forme et d'information*, Millon, Vaucanson 2015, p. 68]), seemingly misquoting Descartes definition of substance in *Principles of philosophy* as "une chose qui existe en telle façon qu'elle n'a besoin que de soi-même pour exister" (R. Descartes, *Méditations et Principes* [éd. Adam-Tannery, IX, II], Léopold Clerf, Paris 1904, p. 14).

[5] Which is at one point even identified as a system: "the milieu itself is a system, a synthetic grouping of two or several levels of reality without intercommunication before individuation". G. Simondon, *Individuation in Light of Notions of Form and Information*, cit., p. 383, footnote 10.

Beyond this basic energetic description, the milieu to which every individual relates is left rather obscure. Most strikingly, Simondon does not discuss the sense in which the milieux to which individuals relate are made up of other individuals. The contents of a milieu are instead obscured by these energetic descriptions; as a source for energy, that is, without discussing whether it is an individual or group thereof which provides that energy, and whether only certain *kinds* of individuals can supply the appropriate form of energy. Instead, milieu becomes a highly general and indeterminate other to which individuals relate, rather than series of individuals, singular and highly determinate.

The indeterminacy of the concept 'milieu' in *Individuation* is odd, both because it is a crucial and universal concept for the description of individuation therein, but also since the text is replete with detailed discussions of example individuations. It is thus not for lack of careful discussion of different kinds of individuations, nor for any reluctance to offer descriptions of milieux required by and formed by *specific* individuals[6]. Instead, this fine-grained analysis focusses almost entirely on the ways in which an individual develops and reproduces, and what little discussion there is of the necessary relation of an individuation to a milieu is highly restricted, with almost no mention of whether and how it is populated with individuals. In the paradigmatic example of crystallisation, for example, the individual is the becoming relation between a seed-crystal and supersaturated liquid – the continuous moment in which the liquid becomes crystal. The milieu, in this example, is the system incorporating supersaturated liquid, including energetic and quasi-atmospheric conditions of pressure and temperature, which is expressed in some detail through analysis of several graphs[7]. There is almost no mention, however, of whether the supersaturated liquid milieu is made up of other individuals. Indeed, whilst Simondon does discuss the sense in which the molecules of the liquid are organised into a crystalline structure by the principle-like action of the seed crystal, he does not explain whether this molecular multiplicity is a collective or otherwise, or whether the relation between seed crystal and molecules can be described as transindividual.[8] Equally, whilst the section following that on crystallisation takes sub-

[6] Indeed, Simondon shows little hesitation in offering careful discussions of the requirements and behaviours of certain species of individuals, that is, even if this might appear to be in tension or even contradiction with his claim to think individuation without formal descriptions.
[7] G. Simondon, *Individuation in Light of Notions of Form and Information*, cit., pp. 57-63.
[8] In an odd turn of phrase Simondon writes that the seed 'possess the value of a principle', and in cybernetic language, that this seed-principle 'controls' (*asservissent*) the energy of the supersaturated liquid with only

atomic particles as its exemplary object, there is no discussion of the sense in which such particles might constitute a collective to which other individuals - at other orders of magnitude, for example – might relate transindividually[9].

When Simondon discusses living beings in the second part of the text, the concept of the milieu is similarly indeterminate. The difference is that here he addresses the question, albeit rather briefly, as to whether groups of individuals form collectives constituted by transindividual relations; that is, whether individuals relate to one another as a series of arbitrarily grouped or non-cohesive individuals, or instead whether certain individuals relate to constitute cohesive interdependent groups. His answer is that vital groups do not constitute collectives, but only 'inter-individual' relations or 'pure social' groups, with the concepts of collectives constituted by transindividual relations reserved for psychical relations[10].

In many respects, the whole discussion of vital individuation mirrors that of transindividuality, to the extent that it deals with dependent relations between individuals and others. The difference, as we will see, is that the concepts of pure social and inter-individual effectively preclude collectives and transindividual relations from vital individuation. Indeed, in this section Simondon is at pains to distinguish growth from individuation, recognising that both involve the production of new multiples. In the case of growth new cells are formed as part of an existing individual, whilst in the case of individuation, a new cell or a multiplicity thereof produce a separate individual from one or more which already exist.[11] Problems arise in species for which growth and individuation appear almost indistinguishable, such as certain corals, which grow by somatic extension but whose parts might break away to form a new individual.[12] Another related problem is whether individuals of species that rely on others of the same species – like bees or termites, for example – are morphological individuals, or whether individuality exists at the level of the group, hive or colony, for example.[13]

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its own weak energetic input (G. Simondon, *Individuation in Light of Notions of Form and Information*, cit., p. 80 [*L'individuation à la lumière des notions de forme et d'information*, cit., p. 86]).

[9] In this regard, Simondon's discussion of orders of magnitude would seem to obscure the issue of transindividuality, since it effectively stands in for the relation between scales without questioning whether individuals at different scales form collectives or not.

[10] G. Simondon, *Individuation in Light of Notions of Form and Information*, cit., in particular pp. 179-180.

[11] Ibid., pp. 180-207.

[12] See for example, ibid., pp. 199-208.

[13] Ibid., pp. 180-207; p. 389.

But whilst relations between individuals are crucial throughout this section, milieu and collective are both hardly discussed. A charitable reading might claim that groups to which individuals relate could be called milieux. But this would only serve to highlight the more significant issue, that these groups are intra-species or intra-population, with relations between different species are hardly discussed. The exception is a brief discussion of parasitism and symbiosis, but once again the relation of an individual to another is restricted to particular pairs of species – the fungi-algae symbiosis known as lichen, and the parasitic relation of Sacculina barnacles and crabs.[14] Indeed, if this were intended as a discussion of a milieu to which individuals relate, it would be a conception implausibly exclusive to certain species.

One can understand why Simondon would be at pains to distinguish individuation from growth, and to offer a criterion for individuation with regards to individuals which depend on groups of the same species. These are basic problems associated with the individuation of living beings. But it is strange, nonetheless, that he does not discuss the sense in which vital individuals depend on others of different species, and also on physical and chemical individuals. Ecological concepts, such as niche or ecosystem are almost entirely absent. Simondon's conception of the milieu thus does not include relations amongst beings of many different kinds, both non-living and living, nor the sense in which particular arrangements of species are necessary for the sustenance of individuals and the milieu they collectively constitute.

Indeed, one might ask the same question about the milieu throughout *Individuation in light of notions of form and information*; namely, whether it amounts to a collective of individuals which is cohesive, to the extent that it is produced by particular beings which also depend on its collective effects. Simondon maintains that all individuals must relate to a milieu, but he never explains whether what those individuals depend on are products of a multiplicity of other individuals as they relate to one another.

This is certainly a lacuna, and one which leaves the concept of milieu deeply indeterminate. It is also odd, given that Simondon dedicates a whole section of *Individuation* to the problem of transindividuality, or the relation between individuations

[14] The thrust of the discussion is to defend Simondon's principle for distinction (what he calls a 'regime of information') between beings which are morphologically one, or almost one. In this regard, the whole section might be considered quite successful, but what he apparently fails to recognise is the sense in which every individual, since dependent on another, might be described as a parasite or symbiont.

and collectives. One might thus assume that the relation between individual and milieu is transindividual, if a milieu is a collective of other individuals, be they physical, vital or psychical. Or at least that physical and vital beings might form collectives, maintain transindividual relations to a group of the same or another kind of being.

Simondon maintains, however, that transindividuality pertains only to psychical individuations, and not to the physical or vital, whilst 'the social' is not considered a milieu except for in children or pathological situations.[15] In this way, he argues clearly that relations between vital individuals are not transindividual, but on the contrary 'pure-social' or 'inter-individual', reserving transindividual strictly for the psycho-social, making no mention of relations amongst physical individuals.[16] In this way, Simondon presents the vital as 'playing the role of a source for psychical individuation' which does not, however, enter into a collective individuation. The individuation of a collective instead requires resort to pre-individual reality (as it is undivided) which then produces a 'new' collective that bypasses and exceeds the vital. He thus writes that

> the pre-individual reality associated with individuated living organisms is not segmented like them and does not have limits comparable to those of separate living individuals; when this reality is grasped within a new individuation initiated by the living being, it conserves a relation of participation that connects each psychical being to other psychical beings; the psychical is the nascent transindividual.[17]

Pre-individual reality is crucial, then, as it offers a reality which is not divided or 'segmented' according to vital limits, and it is what individuals draw on to produce a collective, which is 'not segmented' like living beings. The production of a collective may be a 'initiated by' a living being, but its source is preindividual (which is not vital,

[15] Here Simondon writes that "The social could be a milieu if the individuated being were a simple result accomplished once and for all, i.e., if it did not continue to live by transforming. The social milieu exists as such only to the extent that it is not grasped as a reciprocal social; such a situation only corresponds to that of children or the sick; it is not that of the integrated adult" (G. Simondon, *Individuation in Light of Notions of Form and Information*, cit., p. 328). Although Simondon's claim is rather oblique here, it appears to suggest that a milieu is not reciprocal, whilst the social is. Thus, relation to a milieu is unidirectional, whilst the social or transindividual an interaction. This further emphasises Simondon's restricted conception of relation to milieux, seemingly excluding inter-relations amongst different beings.

[16] Simondon makes this distinction both in the section on 'The individuation of living beings' and that on 'Collective individuation and the foundations of the transindividual'.

[17] G. Simondon, *Individuation in Light of Notions of Form and Information*, cit., p. 179.

psychic or collective) whilst its consequence is a separate and 'new individuation' resulting in a relation between psychic individual and psycho-social collective.

It might be argued that the psychical and collective is always partly vital, as it depends on such a source or foundation. The collective Simondon conceives, however, is distinctly non-physical and non-vital. Equally, many if not most living beings - viruses, bacteria, many or all plants, for example - may be incapable of psychical individuation of the sort Simondon is interested in, and hence also of transindividual or collective existence. Even if it were maintained that many of the above living beings are in fact capable of psychical activity, Simondon argues that vital individuation is neither transindividual nor collective. That is, if plants, for example, have psychical abilities and hence the capacity for collectivity, *qua* vital beings they do not[18].

Simondon further emphasises the distinction between vital groups, on the one hand, and psychic and collective on the other, arguing that the 'collective…is distinguished from the pure social and the pure inter-individual', the former pertaining to the psychical and the latter to the vital[19]. The pure social, he maintains, 'exists in animal societies' and 'does not require a new individuation that expands on vital individuation' in order to exist, as the collective does[20]. Purely social living beings include those which live in colonies, and for which sociality is a condition for existence due to the morphology and physiology of the species. In this sense, 'the bee or the ant is necessarily social', as certain species thereof are morphologically differentiated according to particular functions - worker, soldier, queen, for example – which precludes life apart from the group[21].

'Inter-individual' - the second vital distinction from the psychical and collective - refers to those relations which exist between different vital individuals, but which do not constitute either a 'pure social' group or transindividual collective. Simondon writes thus that

> The collective is distinguished from the inter-individual insofar as the inter-individual does not necessitate a new individuation in the individuals in which it is established, but merely a certain

[18] On plant communication and intelligence, see for example, S. Mancuso, *Brilliant Green: The Surprising History and Science of Plant Intelligence*, Island Press, Washington D.C. 2015.
[19] G. Simondon, *Individuation in Light of Notions of Form and Information*, cit., p. 179.
[20] Ivi.
[21] Ibid., p. 337.

> regime of reciprocity and exchanges that suppose analogies between intra-individual structures without challenging individual problematics[22].

The collective, as we have seen, requires a 'new individuation', which draws on the pre-individual and produces a relation between psychical individuals and a psychical collective. The inter-individual, on the contrary, involves relations between individuals without demanding some change and generation in order that they enter into a collective[23].

More important for our concern is that the collective pertains only to the psychic, whilst the vital is either pure social or inter-individual. Moreover, neither of these concepts are appropriate to describing the cohesion of living individuals, and their dependency on geophysical and vital groups. Pure social only refers to those groups of beings of the same species, whilst inter-individual is inapt to describe the cohesion of different beings in an ecosystem, for example, since the latter is not an arbitrary aggregate of individuals, but a finely balanced group of specific beings. Indeed, an ecosystem describes conditions produced as a function of a group of beings of different species, which are necessary for the survival of the beings of the group. Each being does not depend upon every other directly, but each will depend on all others *qua* constituents of the whole indirectly (it is worth noting, too, that these dynamics of dependency also produce destruction, death and extinction). It should be emphasised, too, that an ecosystem also necessarily includes non-vital processes, such as the movements of chemicals – such as carbon dioxide, oxygen, water and nitrogen - on which living and non-living beings depend. As mentioned above, in his analysis of physical individuation Simondon does not mention the contradistinction of the vital from the collective.

It is strange that Simondon's ontology of individuation includes physical, vital, psychical and collective individuations, whilst maintaining that relation is necessary for any and every individuation, without thinking the collective cohesion of the vast majority of these. The crux of the matter is that he denies any sense of a collective to physical and vital beings. As we have seen, vital beings are either pure social groups by dint of their

[22] Ibid., p. 180.

[23] It is worth noting that whilst this conception of collectives might be appropriate for newly formed groups, but it seems an almost impossible fit for much social analysis as the novelty of the collective effectively rules out the dynamics of pre-existing collectives; the sense, for example, in which an individual is thrown into a family, community, society, country, world or historical period.

species, whereby individuality is often indistinguishable from the group, or they have inter-individual relations, which says nothing of the cohesion produced by multiplicities thereof. An ecosystem, for example, involves dependent relations of a multiplicity of beings. This means beings of various species (including the physico-chemical) depend on effects of the ecosystem as a whole, or indeed, a collective.

One might expect that Simondon's conception of the milieu would fill this lacuna in his analysis, but as we have seen it does not. Neither is milieu considered as a multiplicity of other individuals (as we have seen it is indeterminate in this regard), nor is it considered as a *cohesive* multiplicity of other beings, that is, as something that produces effects required by certain beings which would be altered if its constitution were to change. In ecological terms, a milieu cannot be a merely arbitrary selection of individuals, but rather each being or population thereof will alter the conditions produced, and the capacity for survival and existence of others.

A final defence of Simondon in this respect would be to claim that detailing the regular dependencies of individuals and their regular fulfilment by ecosystems is not analysis of individuation or singularity, but on the contrary of generality or specificity. Whilst this is not incorrect, it does not tally with Simondon's analysis, which is systematic in its dependence on all sorts of specific descriptions from the sciences – of crystals, sub-atomic particles, and living beings. Equally, adherence to such a claim would effectively preclude any discussion of specificity and natural science, including that of the earth system and its contemporary peril, as we will see in the final section.

It may be odd that Simondon maintains that all individuals are dependent on and determined by relations to others whilst denying collective existence to any but psychical individuals, but a partial explanation may be given in considering some of his philosophical opponents. Indeed, Simondon consciously distances himself from Spinoza, who, he argues, 'considers the individual as a semblance' because he does not sufficiently distinguish between (or indeed *individuate*) the interconnected beings in his conception of nature, pitching unity or individuality at the level of the whole of nature.[24] This reflects a wider danger with interconnection and interdependency for a philosophy of individuation, namely, that if beings are rendered parts of a collective as cells relate to an

[24] G. Simondon, *Individuation in Light of Notions of Form and Information*, cit., p. 88.

individual living being, then individuality ceases to exist at the level of organisms, for example, and is instead pitched at a higher level of integration. In a similar manner (though his criticism is less plain) Simondon may be attempting to avoid something comparable in Bergson's philosophy. Bergson contends that duration, both of experience and life, is ultimately a continuous creation. In this way, he argues that all living beings are united in the single durational embrace of the *élan vital*, where divisions are always partial and temporary, and individuation is always 'opposed and at the same time completed by an antagonistic and complementary tendency to associate.'[25]

For a philosophy of individuation, it is understandable that Simondon is keen to avoid losing individuality to the whole.[26] Failing to acknowledge natural collectives of physical and vital individuals of various species remains unconvincing, however. If the concept of milieu were determined even slightly more than Simondon does, it would necessitate recognising the existence of a plurality of other species dependent on transindividual relations constituting a collective, that is, a cohesive group with effects greater than the sum of its parts.

Balibar's transindividual: interactive causality

In this regard, though Étienne Balibar's conception of transindividuality is not directed at the geophysical and vital, it is nonetheless well suited to such an extension, avoiding the psycho-social specificity or the perpetual novelty of Simondon's conception. Balibar's concept of transindividuality maintains that both individual and collective are distinct whilst mutually dependent and determinant, and it was initially conceived as a response to precisely the criticism Simondon levels at Spinoza's philosophy.

Balibar's work on transindividuality attempts to resolve both the problem of holism or organicism, where individuals disappear as parts of a collective, and also the opposite problem, whereby the individual becomes sovereign substance, reducing collectives or the whole to a mere arbitrary grouping. When he first discusses the 'transindividual' with regards to Spinoza's philosophy (borrowing the *term* from Simondon), he does so in part to counter what he regards as the orthodox reading, whereby nature ultimately subsumes

[25] H. Bergson, *Creative Evolution*, The Modern Library, New York 1944, p. 282.
[26] Particularly in the section on living beings, which might be read as a series of attempts to avoid this very problem.

individuality – precisely the sense in which Simondon presents Spinoza's philosophy in *Individuation*. In this way, Balibar argues that Spinoza's philosophy is transindividual, or that individual and collective are mutually dependent and mutually determining.

For Balibar transindividuality is not just an effort to save the individual, and as his work on the concept continued, he pursued a criticism of the other side of the duality, namely, the isolated, 'possessive individuality' of liberal political theory; a subject which both provides the basis for freedom, property and rights, who must be protected from others, or the incohesive brutish collective[27]. For Balibar transindividuality overcomes the disjunction individual *or* collective, through a synthesis whereby both individual and collective relate as distinct parts of a mutually dependent and determinant equilibrium. Both poles rely on and constitute the other without one subsuming or dominating the other.

With regards to the pole of the individual, Balibar's conception of transindividuality is quite similar to Simondon's argument in *Individuation.* The problem revolves around relation, such that individuals rely on a relation to others in order to persist. With regards to the collective pole, Balibar generally lays emphasis on human social relations. The difference, then, is perhaps that whilst Simondon actively restricts the collective to the psycho-social, Balibar's transindividual does not preclude natural collectives, or a materialism which exceeds human psycho-social relations. In this regard, as we will see, he describes transindividuality in materialist metabolic terms, pointing towards an extra-psychic vital transindividual.

Reading Marx, Balibar argues that there is a double constitution of individual and collective, produced mutually through relations. This goes along with a '*double rejection*' of the alternative: *either* isolated and autonomous individuals *or* a whole which subsumes individuals, rendering them mere parts or effects. In this way, he writes that

> individuality is not 'autonomous', conceivable separately as a 'first substance' or an 'originary subjectivity'; but neither is it reducible to the totality which encompasses it, whether this is conceived abstractly, as a generic essence, or in an apparently more concrete way, as a society or a community the unity of which is hypostatised[28].

[27] É. Balibar, *'Possessive Individualism' Reversed: From Locke to Derrida*, in "Constellations", 9/3 (2002), pp. 299-317.
[28] Ibid., p. 144.

Individuality in this regard does not denote freedom from others or ontological primacy, after which association and interaction with others is merely optional or accidental. Instead, individuals are always dependent upon and determined (in-part) by their relations to others and collectives thereof. But neither are individuals reduced to mere parts of a whole, whether that is an essence (like human being) or a historical community. For Balibar, transindividuality requires distinguishing individual and collective whilst also recognising their mutuality and interdependence.

A significant aspect of this transindividual relation between individual and collective is one of mutual maintenance, and it is this which is crucial for our discussion. Individuals might be unique and distinct from others, but they nonetheless depend upon others for their very individuality and existence. Balibar thus argues that in Spinoza's *Ethics,* transindividuality is articulated according to a 'non-linear' causality of 'reciprocal action or interaction' (or '*Wechselwirkung*'), in contrast to a successive causality, such as Kant's transcendental 'principle of temporal sequence according to the law of causality', whereby a principle of causality determines linearity in time.[29] In the same way that each effect depends on its cause according to successive causality, each individual depends on others according to reciprocal causality. The crucial difference is that reciprocal causality is non-sequential. Instead, interactive causality describes a situation in which each being maintains itself through exchanges with others: 'An isolated individual, deprived of exchanges with the other individuals that form its environment, could not be regenerated. It would not exist.'[30] This kind of causality does not initiate new happenings in series, but rather maintains already existing individuals.

Interactive causality is not entirely simultaneous or a-temporal, however. In its 'second order' complexity, it is revealed to be a circular causality.[31] This refers to the sense in which an individual must maintain itself by engaging in 'a regulatory process' through relations with others:

[29] Ibid., p. 46; I. Kant, *Critique of Pure Reason*, Cambridge University Press, Cambridge 1998, pp. 304-316.
[30] É. Balibar, *'Possessive Individualism' Reversed*, p. 52.
[31] Ibid., p. 50.

> each individual's preservation, that is to say its stability and identity, must be compatible with a 'continuous regeneration' of its parts, what today we would call a regulated inward and outward flow.[32]

We note the circular causality in this passage in the sense in which stasis – 'preservation', 'stability and identity' – is combined with flux – 'regeneration', 'inward and outward flow'. Exchanges with others ultimately maintain individuality, such that flux preserves through a process which always aims at returning to a particular state.

Another word for such a 'regulated inward and outward flow' is homeostasis, that is, the regulation of a being or apparatus which maintains a goal state or equilibrium relative to changing exterior conditions. In perhaps its initial formulation by Claude Bernard, this is phrased according to 'internal' and 'external' milieux, such that the former remains relatively stable due to regulating action, in spite of the flux of the latter. Those living beings with the capacity for an internal milieu thus have a degree of independence relative to the external milieu. Bernard famously writes that 'The fixity of the milieu interior is the condition of free and independent life', which has particular purchase in this context, to the extent that the maintenance of an internal milieu – homeostasis - is a condition for a degree of independence from natural collectives, or a physiological condition for transindividuality[33]. As Bernard comments, this is not an absolute independence or freedom, but rather a relative distinction which makes certain vital functions possible. Indeed, the other side of homeostasis, which is often significantly underestimated, is that whilst a being may regulate itself relative to the flux of the exterior milieu, it is no less dependent on it for its continued existence. Whilst homeostasis is not sufficient for the relative independence of individuals relative to a collective in Balibar's terms, it may be considered necessary for certain kinds of being, at least[34].

To this extent, Balibar's account of transindividuality is quite similar to Simondon's general contention that individuals require relations in order to exist, and that many vital

[32] Ibid., p. 52.
[33] C. Bernard, *Leçons sur les phénomènes de la vie communs aux animaux et aux végétaux*, Ballière, Paris 1878, p. 111.
[34] An obvious exception is geophysical beings, which may not be homeostatic, or if so in a seemingly very different manner. Equally, for socio-political transindividuality, physiological homeostasis is clearly not sufficient, though it might be necessary (for humans at least).

individuals engage in homeostasis, or self-regulation relative to others[35]. However, whilst Balibar presents energetic and material dependency as transindividual – a relation between individual and collective - Simondon presents this as inter-individual relations, without any conception of group cohesion. This serves to immunising physical and vital individuals from collectives, or from groups which are not of the pure social. Indeed, Simondon's inter-individual is akin to the isolated individuals of liberal political theory against which Balibar's transindividual is levelled, whilst a purely spiritual collective ignores the sense in which relation to a collective is necessary for the continued existence of an individual, energetically and materially. To claim straightforwardly that Balibar's transindividual is materialist whilst Simondon's is spiritualist should be avoided, however, as any materialism in Simondon's text involves a relation of energy/matter, which is equally apparent for the psychical, which includes the energy transformations involved in sensational abilities such as sight, hearing, touch and so on, each of which involves an energetic relation between an individual and a milieu, other individuals or indeed, a collective. The key difference between the two is rather that for Balibar we might say that any individual is transindividual, whilst for Simondon physical and vital individuals are inter-individual, with the transindividual limited to the psycho-social. For both, individuals depend on and are determined by relations to others, and in broad terms, Simondon's ontology is no less relational and materialist than Balibar's. The difference, then, is that Simondon disallows any cohesive group or collective in the physical and vital domains. In this regard, the indeterminacy of the milieu in *Individuation* serves to occlude this: if Simondon spent more time detailing the nature of milieux, his rejection of physical and vital collectives would have been a great deal clearer.

But whilst Balibar's transindividual might be less conceptually restricted than Simondon's, hitherto, the geophysical and vital have not been included in his analysis. Indeed, in spite of his various metabolic descriptions of transindividual causality, his discussions have thus-far focussed on transindividuality as a concept for human social

[35] Simondon proposes that many living individuals are distinct from physical individuals by dint of their capacity for homeostasis or regulation, which physical beings lack. Though he also acknowledges that there are also many living beings which lack the capacity for regulation, existing a membrane, similar a crystallising limit. See, for example, G. Simondon, *Individuation in Light of Notions of Form and Information*, cit., p. 171; p. 252.

and political existence, whilst there is almost no discussion of relations of dependence and determination between humans and other non-living and living beings.

It would be unfair to criticise Balibar's work in the same way as Simondon's, however. Indeed, whilst Simondon actively claims that physical and vital individuals cannot produce collectives or depend upon transindividual relations, Balibar omits the natural due to a focus on the social. Simondon's text, too, claims a quasi-encyclopaedic scope, with a concept supposedly apt for physical, vital, psychic and social individuations,[36] whilst Balibar's technique is one of textual analysis, making transindividual interpretations of particular texts and thinkers, with no claims to application to the physical or vital.

As we will see in a moment, when we turn to geophysical and vital transindividuality proper, Balibar's transindividual remains wanting in terms of its discussion of successive temporality and history. His focussed on integrative and regulative causalities remain temporalities of stasis and return, rather than succession or change. Simondon's seemingly perpetually novel transindividual is thus pitched to the other pole, as a result of a psychic individuation. In order to grasp the earth system a conception which incorporates a combination of both regulative and successive causalities is required.

Both Simondon and Balibar, then, offer conceptions of individuality which involve a necessary or substantial relation, or which individuals cannot exist without. The problem that we have emphasised with regards to Simondon is his restriction of collectives to psychical individuation, thus excluding the physical and vital from transindividual relations. Balibar makes no such restriction, though thus far he has left geophysical and vital transindividuality out of his account. The following and final section thus attempts to rebut Simondon's restriction of transindividuality and extend Balibar's conception to non-human nature, through discussion of Gaia theory or earth system science, emphasising integrative and regulative causalities, whilst also proposing the addition of linear causality.

[36] See, for example, G. Simondon, *Individuation in Light of Notions of Form and Information*, cit., p. 14; and J.-H. Barthélémy, *Simondon, ou l'encylopédisme génétique*, Presses Universitaires de France, Paris 2008.

Transindividual Earth

Gaia theory and earth systems science offer profound reflections on geophysical and vital relations. For our purposes, though, their importance is in pointing towards a global transindividuality with collective existence at the scale of the earth system[37]. Gaia theory begins with James Lovelock's and Lynn Margulis' hypothesis of the mutual dependency, constitution and regulation of the earth's atmosphere by the biota[38]. They argue that those aspects of the earth's atmosphere which remain constant throughout other changes in the earth system regulated by interactions between the biota and geophysical processes. In this way, they contend that life enacts homeostatic control over aspects of atmosphere, keeping the planet survivable and comfortable for some kinds of life.[39] For lovelock, Gaia is a collective made possible by the interactive and regulative causality produced through relations of the activity of the totality of geophysical and vital beings. It is a cohesive collective rather than a merely arbitrary aggregate as it produces effects which are a function of the whole, or more than the sum of its parts.

The counter argument serves to further emphasise the collective sense of Gaia theory. This contention is that whilst life depends on geophysical processes, it does not determine or regulate them. Instead, the biota bends historically to the geophysical through the operation of natural selection, which produces species increasingly fit relative to geophysical and vital circumstances. In this view, the earth's atmosphere determines living beings, and living beings depend on particular atmospheric conditions, but the inverse is not the case. According to Gaia theory, by contrast, living beings and atmosphere determine and depend on one another.

Lovelock proposes that his Gaian understanding of mutual dependence and determination demands a collective approach to the scientific study of the earth system:

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[37] A totality crucial for earthly life, but a scale which is nonetheless relatively miniscule in light of a relational cosmology. See, for example, Lee Smolin's and Roberto Mangabeira Unger's reflections on relationality in a Leibnizian cosmology (L. Smolin, R. Mangabeira Unger, *The Singular Universe and the Reality of Time. A Proposal in Natural Philosophy*, Oxford University Press, Oxford 2015).

[38] J. Lovelock, L. Margulis, *Atmospheric homeostasis by and for the biosphere*, cit.

[39] As this thinking developed from hypothesis to theory, particularly with Lovelock's extensive writing on the topic, the teleological conception of life's regulation of the atmosphere was dropped, though homeostasis was retained. Homeostases are considered the result of accident rather than purposive behaviour. See, for example, Lovelock's 'Daisyworld', a simulation of planetary regulation by the biota (see J. Lovelock, *Ages of Gaia*, Oxford University Press, Oxford 1988, pp. 42-63).

> suppose that the Earth is alive. Then the evolution of the organisms and the evolution of the rocks need no longer be regarded as separate sciences to be studied in separate buildings of the university. Instead, a single evolutionary science describes the history of the whole planet. The evolution of the species and the evolution of their environment are tightly coupled together as a single and inseparable process.[40]

The earth system is constituted by differentiated geospherical and vital beings or individuations, which together produce a 'single inseparable process'. This whole involves collective or mutual determination rather than any order of determinative privilege. Thus, geological history (or 'the evolution of the rocks') cannot be considered the 'first principle' or material basis for life. Instead, each determines the other, and there is no foundation as such.

The two most significant temporal modes of Gaia, in Lovelock's work, are homeostasis and historical change, or circular and successive causalities. The first has to do with regulation and maintenance, and the second involves a shift which eventually produces a new homeostasis, which describes a different period or 'age' of Gaia.

An important example of regulation is Lovelock's theory that atmospheric oxygen content has remained stable due to a process of negative feedback, which produces a homeostatic equilibrium at around 21 percent of atmospheric content. His argument runs as follows. Evidence that atmospheric oxygen has remained above 15 percent is provided by high concentrations of charcoal present in the fossil record as far back as 200 million years. The reasoning here is that charcoal results from wood fires, which require oxygen content above 15 percent, below which fires are almost impossible. Evidence that oxygen has not exceeded 25 percent is provided by evidence of sustained forests in the fossil record. As even damp wood burns above 25 percent oxygen content, many or all forests would likely have been wiped out by forest fires if this had taken place.[41] The steady-state of around 21 percent oxygen content could, however, be a mere geospheric fact unregulated by living beings. Indeed, the Gaian claim is that atmospheric oxygen content is maintained in homeostasis by interactions between living beings and the geosphere through a process of regulation.

[40] Ibid., p. 12.
[41] "Below 15 percent there could be no charcoal; above 25 percent no forests. Oxygen is 21 percent, close to the mean between these limits" (Ibid., p. 132).

Lovelock reasons using the cybernetic concepts of positive and negative feedback – close, if not identical to the integrative and regulative modes of causality emphasised by Balibar. First, a positive feedback loop. Trees produce the majority of atmospheric oxygen, and when they burn in forest fires, oxygen content increases, in turn increasing the likelihood and intensity of fires, which again further increases oxygen content, the likelihood and intensity of forest fires, and so on. Once this cycle has begun through forest fires, it intensifies, with fires acting as sources of positive feedback. Since trees produce the majority of atmospheric oxygen content, however, eventually fire-depleted forests lead to a reduction in oxygen production. This in turn reduces the likelihood and intensity of forest fires, allowing forests to re-grow. This is a negative feedback loop, which effects an overall control over the positive feedback loop, reducing oxygen content and allowing trees to regrow. Once forests are replenished, the cycle may then repeat. Today, earth system scientists today offer a slightly different explanation – having to do with carbon burial and the phosphorous cycle in the ocean as well as forest fires on land - but the concepts of negative feedback and homeostasis still apply, and they are conceived through an interaction between living beings and geophysical processes[42].

Theoretical analysis such as this expresses the sense according to which Gaia theory, Gaia or the earth system is a collective; it is more than the sum of its parts or a mere aggregate of individuals in inter-individual relations. Regulation of oxygen content is a process constituted by an interactive and repetitive collective, with collective effects. This thinking is incompatible with Simondon's conception of the inter-individual and the pure social. Indeed, dependency on oxygen levels around 21 percent, both for respiration and for the absence of fire, for example, cannot be said to depend on relations between an arbitrary group of other individuals, or those which do not form an inter-dependent whole, as the regulation of oxygen is a process constituted by a collective of photosynthesisers. Geophysical and vital processes constitute effects which are homeostatic or relatively stable, for a period at least, and these effects are collective to the extent that they depend on the maintenance by regulation of a state produced not by an arbitrary series of individuals, but by beings which are identical in a certain way - trees, for example, produce oxygen and act as a carbon sink, and they *must* do so for this collective effect.

[42] See, for example, H.J. Schellnhuber, P.J. Crutzen, W.C. Clark, M. Claussen, H. Held, *Earth System Analysis for Sustainability*, The MIT Press, Cambridge 2004.

Collective processes and effects such as this appear closer to Simondon's concept of the 'pure social', or the necessarily collective life of certain species. In this sense, he notes that certain specific morphological specialisations produce collective dependency. Thus, ants in a colony - workers, soldiers and queen, for example – do not merely depend on a series of others as isolated individuals, but rather each depends on the collective effect of the whole. In this way, beings living in the earth system depend on others due to their abilities and lack thereof. Beings which require oxygen for respiration thus depend on photosynthesisers, as the former lack the ability to convert oxygen for themselves, which is analogous with the sense in which a soldier ant might be said to lack the ability to provide sustenance for itself and for the queen, in order to sustain colony. The point is not merely that all living beings are dependent on other living beings and geophysical processes – something which Simondon affirms in his conception of relation. Rather, *contra* Simondon's position, living beings and geophysical processes depend on *collectives* of other beings, and perhaps the collective of the earth system.

As mentioned above, much of this analysis is conceptually similar to Balibar's own interpretation of transindividuality in Spinoza's *Ethics*, particularly in laying emphasis on integrative and regulative causalities with a metabolic vocabulary. Gaia theory might also provide an extension to Balibar's conception of the collective in its emphasis on a transindividual causality associated with epochal succession. Indeed, Gaia theory is necessarily historical, with a *longue durée* pertaining to billions of years. In this way, Lovelock argues that the history of the earth system is expressed by a series of homeostatic periods, produced, destroyed and replaced in part through by events and collectives the earth system[43].

In this sense, homeostasis makes possible the description of 'ages' of Gaia which are periods of relative stability, or homeostasis. Successive causality ends one period of homeostasis, after which a regulative stabilisation produces a new period:

> Gaia theory predicts that the climate and chemical composition of the Earth are kept in homeostasis for long periods until some internal contradiction or external force causes a jump to a new stable state. On such a living planet, we shall see that punctuated evolution and abundant oceans are normal and expected[44].

[43] Again, it is important not to lose sight of the (vastly) bigger, cosmological picture: even the earth system is not independent or produced *ex nihilo* (which might be said of the so-called Big Bang, too).
[44] J. Lovelock, *Ages of Gaia*, cit., p. 13.

Gaia theory presents the structure of geophysical and vital history as a succession of periods of homeostasis – 'ages of Gaia' - interrupted by contradiction or event and then stabilised by a new homeostasis, or age. This may help to explain the 'punctuated equilibrium' interpretation of gaps in the fossil record if living species evolve fitness relative to a particular steady state of the collective earth system, which remains stable until a change in the system, when new selective pressures may be exerted on living beings. An example of this is the 'Great oxygenation event', the hypothesis that the appearance of photosynthesisers around 2.2-2 billion years ago lead to global cooling as a result of a decrease in the partial pressure of methane. Eventually, so the thinking goes, this led to a glaciation and the first mass extinction, that of anaerobic bacteria. A historical event or singularity, like the appearance of photosynthetic life may have punctuated atmospheric equilibrium, changing geophysical homeostasis and leading, in turn, to an extinction of a great many species of living beings and glaciation, a new steady-state of the earth system.

Today another event is in-process in the earth system with the capacity for mass extinction, namely, global heating resulting primarily from carbon dioxide released into the atmosphere by human techniques for energy transformation, and exacerbated deforestation, or the destruction of carbon sinks across the earth. This process has the effect of increasing global temperatures, which will render many areas of the planet uninhabitable or uncomfortable for many species of animals (including humans) currently living in those regions, whilst also further impoverishing many of the poorest and those living in the global south. This event involves a series of positive feedback loops, whilst the human technical response involves attempting to restrain these through the instigation of processes of negative feedback. This illuminates the dependence of human life on other life and also, it should be emphasised, on non-vital geophysical processes. Physical, chemical and vital individuations depend on one another.

The climate crisis is a transindividual event in the terms we have discussed to the extent that it involves a series of relations amongst individuals and collectives. As in the analysis of ages of Gaia, the sense of a cohesive collective is made clear through change: the interdependency of different individuals in a collective (their cohesion) is revealed when a particular change affects one or more, with a series of resultant impacts altering the

circular causality or regulation of that whole collective. As we have highlighted, Simondon's position crucially underestimates the cohesion of physical and vital individuals in failing to regard them as sustaining transindividual relations producing cohesive groups or collectives. In Balibar's terms, the climate crisis points to a crisis of causality, to the extent that the *management* of the crisis – restraining positive feedback or tipping points as far as possible, for example – involves an attempt to control or restrain changes involved in the Gaian age in which we exist. In this regard, a politics is being waged over techniques for regulative causality, control or negative feedback, in order to avoid certain natural-historical changes resulting from processes of positive feedback. Political history today, then, might be seen to incorporate attempts to control natural history.

In this sense, finally, Marx's proposition in *The German Ideology* may resonate today more strongly than ever:

> The first premise of all human history is, of course, the existence of living human individuals. Thus, the first fact to be established is the physical organisation of these individuals and their consequent relation to the rest of nature. Of course, we cannot here go either into the actual physical nature of man, or into the natural conditions in which man finds himself – geological, hydrographical, climatic and so on. The writing of history must always set out from these natural bases and their modification in the course of history through the action of men[45].

Today we *must* go into the physical nature of man as well as the geological, hydrographical and climatic conditions he finds himself in. The future of transindividual analysis thus ought to involve establishing the 'physical organisation of these individuals and their consequent relation to the rest of nature'. As we have seen, this means recognising the cohesion of natural groups as collectives both sustained and changed by transindividual relations. This will also involve understanding the natural conditions we find ourselves in and their 'modification in course of history through the action of men'. These modifications disrupt homeostatic stability in the earth system, the effects of which pose an existential threat to human life due to the transindividual dependency of geophysical, vital and psychic beings on the Gaian or earthly collective.

[45] K. Marx, *The German Ideology*, Prometheus Books, Guildford 1998, p. 37.