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Sense and life: Merleau-Ponty's philosophy of nature and evolutionary biology·

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1. Merleau-Ponty and biology

1.1 Phenomenology and the experimental sciences

It seems widely accepted that Merleau-Ponty was the phenomenologist who engaged most directly and seriously with the empirical sciences, specifically psychology and biology.[1] There are good grounds for this assertion. In his first major work, *The Structure of Behaviour*, Merleau-Ponty's investigation of the relations between consciousness and nature deals extensively with empirical psychology and to a lesser extent, biology. Already in this text, he grapples with the same problem that will concern the lectures, notes and texts that he was working on at the end of his life:

> And once the criticism of realistic analysis and causal thinking has been made, is there nothing justified in the naturalism of science—nothing which "understood" and transposed, ought to find a place in transcendental philosophy. (Merleau-Ponty 1963, p. 4)

What will have changed in the period between *The Structure of Behaviour* and the courses in the late fifties and early sixties at the *Collège de France* is the concept of nature that the philosopher is working with. In the former, Merleau-Ponty begins by defining nature as the "multiplicity of events external to each other and bound together by relations of causality." By the time of the lectures on the concept of nature at the *Collège de France* Merleau-

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[1] Setting aside the question of whether someone like Ernst Mach or Gilbert Simondon was a phenomenologist.

Ponty has understood that in order to understand the dynamic of consciousness *in* nature, he will have to attempt to rethink the concept of nature.

The engagement with the sciences continues after the Second World War. Large portions of *Phenomenology of Perception* involve engagement with and close analysis of Kurt Goldstein's work in *Gestalt* psychology as well as other psychological theories contemporary with the book. In his later lectures at the *Collège de France*, Merleau-Ponty examines the work of several biologists and ethologists in the course of working toward the development of his own ontology of nature, a project that was in progress at the time of his death. Merleau-Ponty's status as the phenomenologist friendly to the sciences, in contrast to Husserl's apparent anti scientific-realism and Heidegger's critique of the sciences for lacking adequate grounding in the question of being,[2] has been reinforced after the fact by the recent uptake of his work on perception and embodiment by the empirically friendly fields of cognitive science and still more recently enactivist theory of cognition (e.g. Thompson 2010).

It has not all been smooth sailing in the relation between Merleau-Ponty, or better Merleau-Ponty scholarship, and the sciences. In the rush to build an amicable entente with the powerful explanatory efficacy of the empirical sciences it is sometimes forgotten that much of *Phenomenology of Perception* is devoted to a critique of the empirical sciences, specifically for an inability to comprehend their own results, and this is a theme that continues throughout Merleau-Ponty's work. Thomas Baldwin has recently examined Merleau-Ponty's critique of the natural sciences in *Phenomenology of Perception* and argued that it is ultimately unconvincing, parochial, and even at points misinformed (Baldwin 2013).

When one examines closely Merleau-Ponty's engagement with the sciences what becomes clear is that he has a specific appreciation for psychology and biology in particular when these sciences behave in a fashion amenable to phenomenology. That is, when they can be interpreted in such a manner as to allow explanatory room for the primacy of the transcendental field of

[2] It is important to note that neither Husserl not Heidegger were crude anti-naturalists as they are sometimes characterised as being. What both objected to in their respective criticisms of naturalism was a crude physicalism.

perception as a field of sense and most importantly of latency or potentiality. This is particularly the case in relation to *Phenomenology of Perception*. Goldstein's emphasis, for example, on the functional primacy of meaningful relations over mechanisms fits perfectly with Merleau-Ponty's own thesis, but is grounded in neurology not phenomenology (Goldstein 1995, especially chapter 6).

Similarly, in the *Nature* lectures given between 1956 and 1960 at the *Collège de France*, Merleau-Ponty's biological interlocutors are in large part ethologists studying animal behaviour (Portmann and Lorenz) or philosophically inclined biologists who were deeply suspicious of the claims to causal closure in biology made by mechanistic philosophy (Jakob von Uexküll, Hans Dreisch, E.S. Russell); biologists, in other words, who would have endorsed the now relatively uncontroversial claim that explanations in biology cannot be reduced to explanations in physics and chemistry (e.g. Mayr 1985). What Merleau-Ponty appreciates in the biologists that he refers to approvingly in his studies is the primacy of a field of meaningful relations over mechanism, and the amenability of their experimental results to supporting such a thesis.

That Merleau-Ponty took this attitude and approach toward the biology of his day should not be surprising. It, in large part, takes its leave from Husserl's own attitude toward biology in its relation to transcendental phenomenology. Husserl, who corresponded with both von Uexküll and Driesch, writes in the twenty-third appendix to the *Crisis* text that biology not only proceeds by way of a form of empathy (*Einfühlung*), an idea that Merleau-Ponty repeats in the *Nature* lectures, but also that biology is the empirical science closest to transcendental phenomenology in both its aims and methodology[3] due to the fact that biology (properly understood) is devoted to the theoretical elaboration of the originary sense formation (*ursprünglichen Sinnbildung*) of the lifeworld (Husserl, 2013, p. 8). The idea of biology as closely related to, or a pathway into the universal science of sense formation was not one that Husserl was alone in holding. Jakob von Uexküll provides a similar definition

[3] "Biology's proximity to the sources of evidence (*Quellen der Evidenz*) grants it such a proximity to the depths of the things themselves (*Tiefen der Sachen*), that its access to transcendental philosophy should be the easiest and with it the access to the true a priori to which the world of living beings refers, in its greatest and most constant generalities which cannot be captured without question in their a priori nature (as unconditionally universal and necessary)" (Husserl 2013, p, 7).

of biology in distinction from physiology, which was concerned with organic mechanism in his *Theoretische Biologie* (1920), a position further elaborated in *Streifzüge durch die Umwelten von Tieren und Menschen* (1934), where he argues that philosophy of biology must take seriously the perceptions and indeed perceptual meaning-worlds of non human animals, without insisting that animals all have conscious relations to their worlds. A similar understanding of biology as being concerned with meaningful behavioural relations between organic systems and environments can also be found in Kurt Goldstein's *Der Aufbau des Organismus* (1934). All of these approaches seem to point to a special relation between life and sense-formation: sense-formation is the domain of life, or put otherwise, life makes sense – a claim that we also find in George Canguilhem's work.[4] This explains why Husserl thought of biology as a universal science (like physics) and not one that would *necessarily* be constrained by the known conditions of earthly biology, "membrane-based cellularity, semi-conservative DNA/RNA-mediated self-replication, protein-regulated metabolism, Darwinian evolution, non-equilibrium energization" (Mann 2013, p, 155), but rather the invariant and eidetic transcendental conditions of sense formation.

1.2 Behaviour and Latency

Merleau-Ponty's interest in biology as relevant to his attempts to develop a philosophy of nature that would serve as a way into ontology is down to two fundamental concepts: behaviour and latency. Where he praises the work of experimental and theoretical biologists it is because he sees their work as emphasizing the importance of these two ideas, which are arguably the cornerstones of his entire philosophical edifice. Thus Merleau-Ponty's praise of certain experimental biologists stands in relief from his critique of what he, following Bergson, calls the "ultra-mechanism" of "Neo-Darwinism in its most developed forms," which fittingly he thinks ignores completely the significance of behaviour and latency. The examination of behaviour at various organic levels, embryology and morphology, instinct and complex response to environmental stimulus and also problems of phylogenesis,

[4] Cf. "To define life as a meaning inscribed in matter is to acknowledge the existence of an *a priori* objective that is inherently material and not merely formal. […] If life is the production, transmission and reception of information, then clearly life involves both conservation and innovation." (Canguilhem, 1994, p. 317-19)

which Merleau-Ponty discusses briefly, tantalizingly telling his listeners "put the very fabric of being in question," is part of the broader and also unelaborated argument that Merleau-Ponty makes in the Résumé of his third course on the concept of Nature at the *Collège de France* ("Nature and Logos: The Human Body") concerning "a scalar structure of reality" containing a "plurality of space-time levels" and "'organo-formative' territories which impinge on one another and possess a periphery beyond their focal region" such that "organisms and types would appear as 'traps for fluctuation,' as 'patterned jumbles,' and as variants of a sort of 'phenomenal topology' *without* any break with chemical, thermodynamic and cybernetic causation" (Merleau-Ponty 1970, p. 126-28). What is very important to emphasize here, and what is consistent with Merleau-Ponty's repeated claim that scientists often overlook the significance of their results, is the insistence that Merleau-Ponty's ontology of Nature is inflationary and does not break – in the sense of discard or seek to refute – with scientifically established forms of causation, but seemingly seeks to give them an added "dimensionality" that would allow for a fuller explanation of phenomena than the current model provides. The dynamics of this expanded ontology of nature can and should, according to Merleau-Ponty, be explained in terms of behaviour, and specifically in terms of meaningful relations.

A first step toward the development of this new ontology is the particular emphasis on the whole organism as the irreducible unit of behaviour. Merleau-Ponty takes over and shares this idea with Goldstein, but also Russell and Canguilhem – the shared affinity to the work of Goldstein and von Uexküll is an under-explored bridge between Merleau-Ponty and Canguilhem and between phenomenology and French epistemology more generally. The primary level of behaviour is the dynamic of meaningful relations between an organism and its environment, this and not reflex or molecular mechanism subsequently becomes the focal point of biological inquiry. This is precisely what Merleau-Ponty approves of and why he sees biology as a way into ontology insofar as its results point toward a privileged manifestation of the intertwining of the visible and the invisible, or, put otherwise, matter and sense, and hence a way out of the bifurcation that Merleau-Ponty struggled with his entire career, that between empiricism and idealism or as he puts it elsewhere, the "realist-causal" order and the

"idealist-constituting" order of motivation.[5] The study of behaviour in living systems thus gives access to what Merleau-Ponty elsewhere calls "a type of being other than the one where what *we call* 'matter,' 'spirit,' and reason reside," the disclosure and analysis of which was the aim of his late ontological project:

> The goal is φύσις – λόγος – History […] Unconcealment of a type of being other than the one where what *we call* matter," "spirit,' and reason reside. We are in contact with this type of being through our science and our private and public lives. But it does not have official existence: our "philosophical" thought remains spiritualist, materialist, rationalist or irrationalist, idealist or realist when it is not in silence. (Merleau-Ponty 1996, p. 37)

This line of thought is of course the beginning of a research programme not its conclusion. The emphasis on behaviour and the ontological priority of the whole organism over and against a reductionist programme posits (among others) the question of biological individuation from a milieu or ecology.[6] How are we to understand the processes or dynamics of individuation such that we can at some point make reference to the ontological and not only epistemological primacy of the whole organism? Similarly, if the organism must be thought of in terms of its behavioural repertoire, which emerges neither purely on the side of the organism nor the environment, how do we segregate or distinguish the whole organism from a set of interrelated and interdependent functions that emerge within the dynamics of the ecosystem?

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[5] Cf. "Biology thus has an ontological scope, it does not teach us only about local region of being (terrestrial and limited, on the earth itself to a canton). It has the same *Welt allgemeinheit* as physics. It has its descriptive *Weltlichkeit*, which is one of historical being […]." (Merleau-Ponty 1996, p. 90). This could be a paraphrase of Husserl. On the "realist-causal" and "idealist-constituting" orders as two "correlative aspects of being" see Merleau-Ponty 1990, p. 92.

[6] Merleau-Ponty lists the problem of delineating the organism from its milieu as one of the ideas that modifies Darwinian philosophy (Merleau-Ponty, 2003). A discussion of this problem also takes place in the lecture notes on "Animality: The Tendencies of Modern Biology" (Merleau-Ponty 2003, pp. 147- 151). An organism has traditionally been understood as an "autonomous cell or group of coordinated cells with the same genome." Metagenomic studies as well as the aforementioned discovery of the importance of the human microbiome have called into question this narrow genome-centric understanding of the organism in favour of more functional understandings.

In other words, can we make a satisfactory ontological distinction between ecology and organism, and not just an epistemological one? In the terms that I cited earlier how do we isolate "'organo-formative' territories which impinge on one another and possess a periphery beyond their focal region" and "organisms and types" that "appear as 'traps for fluctuation'" into discrete entities? The epistemological problem of delineating the organism within ecological dynamics seems for Merleau-Ponty to mark out the path from epistemology to ontology. A concrete instance of this question that is currently enjoying attention is whether a distinction can be drawn between the isolated human organism and the microbiome that not only helps sustain the life of the human organism, but has been shown to play an important role in nearly all the vital functions of the "human organism" including gene expression (see, e.g. Hooper and Gordon 2001).

Merleau-Ponty and Canguilhem's student Gilbert Simondon already points a way into this labyrinth of problems by emphasizing the hylomorphic error of focusing on the unit of individuation, the individuated thing, rather than examining and giving priority to the process of individuation itself in which individuals manifest as stable configurations of processes.[7] Bringing this back

[7] "The reality of being as an individual may be approached in two ways: either via a substantialist path whereby being is considered as consistent in its unity, given to itself, founded upon itself, not created, resistant to that which it is not; or via a hylomorphic path, whereby the individual is considered to be created by the coming together of form and matter. The self-centred monism of substantialism is opposed to the bipolarity of the hylomorphic schema. However, there is something that these two approaches to the reality of the individual have in common: both presuppose the existence of a principle of individuation that is anterior to the individuation itself, one that may be used to explain, produce, and conduct this individuation. Starting from the constituted and given individual, an attempt is made to step back to the conditions of its existence. This manner of posing the problem of individuation--starting from the observation of the existence of individuals—conceals a presupposition that must be examined, because it entails an important aspect for the proposed solutions and slips into the search for the principle of individuation. It is the individual, as a constituted individual, that is the interesting reality, the reality that must be explained. The principle of individuation will be sought as a principle capable of explaining the characteristics of the individual, without a necessary relation to other aspects of being that could be correlatives of the appearance of an individuated reality. *Such a research perspective gives an ontological privilege to the constituted individual*. It therefore runs the risk of not producing a true ontogenesis--that is, of not placing the individual into the system of reality in which the individuation occurs" (Simondon 2009, p. 4).

to Merleau-Ponty's analysis of ethology and developmental biology, what is relevant here is the claim that these two sciences are revelatory of an ontological field characterized by processes of individuation and generalization.

This "type of being," which Merleau-Ponty believed the developmental biologists and ethologists he refers to were in "contact" with, is characterized by the primacy of latency over and above actuality. Latency can be introduced with two propositions: (1) potentiality precedes actuality or is the first actuality; and (2) in a nonlinear system the antecedent(s) is not exhausted by the consequent(s) in the dynamics of the system. In this understanding a linear system would most likely be understood as an extremely stable non-linear system or as an abstraction from a more encompassing set of non-linear dynamics. It is important to specify that Merleau-Ponty's emphasis on latency over actuality refers to an indeterminate latency that properly is prior to actuality, not to an actuality that is latent in the sense of not-yet. Rather than actuality being the first latency, latency is the first actuality. This formulation redrafts ontological difference: "there is more to Being than beings exemplify."[8]

The terms latency and potentiality have both been used in the preceding paragraph. To my knowledge both appear in Merleau-Ponty's corpus and no systematic effort is made to separate them out. A standard explanation of their difference is that what is latent can be expected to become manifest – latency is the waiting room of actuality. Potentiality holds no such pretensions. However Merleau-Ponty's deployment of the term latency seems to throw this distinction into some disarray. Latency may be said to differ from potentiality if we understand the latter in a "raw" sense. Latency is something like potentiality that has a stylized developmental trajectory, meaning that it is individuated – cooked or conditioned and limited by its environment. Potentiality then goes from being a domain of being, or non-sensically, a domain of partial or quasi-being to being a properly ontological term: potentiality is general un-stylised being (I think that there is a connection here to Simondon's notion of "pre-individual fields"). Stylised fields, or perhaps better *flows*, of latency are marked by their developmental orientation, which remains just that, an orientation not a determination; hence

[8] I am grateful to Iain Hamilton Grant for this phrasing.

Merleau-Ponty's continued references to "watermarks." Not forgetting that we are dealing here with a phenomenological ontology, latency is perhaps best understood in terms of powers of manifestation. This description radically alters the relation between potentiality, latency and actuality. Rather than latency qua stylized potentiality being a distinct domain of being from actuality, or worse, somehow less than actual, a weak form of actuality, actuality must now come to be thought as a region of potentiality and even of latency. The actual(s) are metastable configurations (or structural stabilities) of flows of latency. This is precisely why when a metastable configuration or field moves from one state to another (behaviour) the flow of latency that envelops this change is not exhausted – the antecedent flow(s) of latency is not exhausted by the metastable configuration(s) that is consequent of its dynamics.

What I have said in the preceding paragraph is obviously a very rough sketch of an ontology that changes the traditionally conceived relations between potentiality and actuality. I introduce this here because it is necessary to understand how and why Merleau-Ponty reads the biologists that he discusses and why he continually returns to the ideas of latency and style in these readings.

It is the emphasis on latency that draws Merleau-Ponty to Goldstein's and Russell's respective whole organism neurology and developmental biology (as well as Lorenz's ethology, which we will discuss in the second part of the paper). Both held the idea that the ontological unity of the organism cannot be analysed in terms of its component mechanisms or parts wherein some form of causal closure could be seen to apply without "loss," that is without reducing the organism to something "abstract and unreal" (Russell, 1930, p. 147; as cited in Robert, 2004, p. 69). What decomposition of behaviour either in embryonic development or in the interaction between a fully developed organism and its environment misses out is precisely the latency that is always present in behaviour. Insisting on the phenomenal presence of latency in behaviours, including morphogenesis, also upturns the conventional understanding of latency as not evident and not active. In the new understanding, latency must be understood as both evident (visible) and active. The problem up till now, according to Merleau-Ponty, has been that

most biologists tend to ignore what they are unable to account for in reductionist models of nature, but what nonetheless may be apparent.

For Goldstein as well as for Canguilhem the necessity of a whole organism approach and implicitly the contention that antecedent is not exhausted by the consequent in behaviour is clear from how an organism responds to various demands from its environment. As Canguilhem (1994) states, normal function is in fact the capacity to be able to adapt to multiple norms, i.e. to be able to respond to varying demands occurring within and emanating from various sets of environmental constraints in a fashion conducive to the continuing flourishing of the organism. The constraints on behaviour have to do with the body of the organism as well as its surroundings. Depending on the various constraints, the organism responds to demands from its environment in various ways. The response is not a fixed mechanism but rather proceeds from an environmentally constrained reserve of latency towards actualized behaviour or movement. That the actual behaviour of movement does not exhaust the latency from which it springs is evident in the fact that the movement or response to an environmental demand differs under varying ecological and bodily conditions. Similar stimuli in different contexts evoke different behavioural responses, indicating a relation that is more akin to a conversation than a reflex or mechanism. Hence Goldstein's insistence, which Canguilhem builds on, that it is an error to look for either the pathology or its symptom in specific mechanisms. Rather what is pathological and can be described in terms of symptoms is incapacity on the part of the organism to respond in an adequate fashion to the demands of its environment. Latency while preceding actuality and not being exhausted by it is nonetheless continuously constrained and conditioned by it.

Russell makes similar observations, not concerning the plasticity of behaviour but rather the stability of development in relation to embryogenesis despite varying environmental conditions. In *The Interpretation of Development and Heredity* he writes: "if the conditions do not permit a straightforward normal development, if for instance the developing organism suffers deformation or loss of parts, it has to a considerable degree the power of so modifying the course of its development as to cope with the unusual situation, replacing for example the missing parts" (Russell 1930, p. 7). Despite language that might suggest different, Russell is careful to avoid recourse to agency or entelechy

within the process of development, criticizing the "gene theorists" of his time for proposing a "material entelechy" in the germ plasm and also insisting that the developing organism only act *as if* it were fulfilling an end or purpose.[9]

Interpreting Russell via Merleau-Ponty, the explanation for how an organism can stay developmentally oriented toward a species-typical form despite varying environmental obstacles and constraints does not have to do with an entelechy within the germ plasm or genome or other appeals to various forms of finalism, but rather is a case of an indeterminate yet oriented path of development that is latently present. Latency does not then become an invisible magical power but is in fact a visible phenomenon, in filigree (to use Merleau-Ponty's term). For Russell, this is part and parcel of his insistence on "accepting the observed facts of development" and not allowing a methodological recourse to the artificialism of abstraction, which he argued was unable to account for the phenomena of development – a claim that Merleau-Ponty would have surely appreciated insofar as it is in the vein of Merleau-Ponty's own contention that the scientists often do not understand what they are looking at, or limit themselves conceptually due of self-imposed epistemological restrictions.

Merleau-Ponty of course agrees that the primacy of the whole organism is an observable phenomenon, not only in its actual movement or behaviour but also in its developmental and behavioural latency, which again Merleau-Ponty says is visible in *filigree*, as a *watermark*, in the *style* of the organism's movement. Referring back to Russell's interest in how the organism, under widely varying environmental constraints and input, develops according to a species-typical form, Merleau-Ponty remarks that the being of a species is a watermark, and perhaps even more mysteriously that styles, which give to the watermarks their sense, are the modality of evolution. In this sense when we speak of the whole organism, it is important to insist that actuality does not exhaust the wholeness of the organism. The latent visibility is not a visibility in principle, e.g. all that will have been visible in retrospect upon the organism's death. Rather, the insistence of the visibility in filigree of latency gives a new sense to the visible altogether. It is this sense of

[9] See Robert (2004, pp. 68, 70). Merleau-Ponty actually seems to misread Russell and attributed the idea of a "material entelechy" to him. Russell is objecting to what he sees as the "gene theorists" taking the germ-plast as a "material entelechy."

being visible in filigree that Merleau-Ponty credits the developmental biologists and ethologists with discovering. This is precisely the "new type of being" that he refers to. It is a type of being that he thinks the neo-Darwinians cannot recognize, despite their own contact with it.[10]

Latency, which orients an organism in its development toward a species-typical form, is visible in the fashion that the organism responds to obstacles and remains on its orientation toward that form. But precisely because the organism responds to obstacles in a fashion that cannot be accounted for mechanically under the constraints of causal closure without the loss of the *explanandum* this orientation cannot be described in terms of a fixed track of development. Latency, visible in the developmental trajectory and best described as constrained-potentiality as opposed to a pure or unconstrained potentiality, is also the paradigmatic example of what it means to talk about the "visibility of the invisible" – explaining precisely why a philosophy of nature that passes through developmental biology was for Merleau-Ponty a propaedeutic to ontology.

2. The EES and the new ontology.

2.1 Merleau-Ponty's critique of Neo-Darwinism

For precisely the same reasons that he is enthusiastic about developmental biology and ethology, Merleau-Ponty is critical of neo-Darwinian evolutionary biology. Neo-Darwinism (or the modern evolutionary synthesis), in Merleau-Ponty's view, is guilty of both ultra-mechanism and finalism (if indeed these are things to be guilty of). In this position Merleau-Ponty follows Bergson. Although he does not go into any great detail about these criticisms, we can extrapolate from the positive assessment of developmental biology that the epistemological model of the Neo-Darwinists does not adequately take into account the findings of developmental biology. One of the reasons that Merleau-Ponty provides for this in his *Nature* lectures is reiterated by

[10] "Biology shrinks back from making its anti-mechanistic revolution, forgetting that the overthrowing of the mechanistic framework of physics has been made necessary by some facts: Michelson's experiment—Planck's experiment" (Merleau-Ponty 2003, p. 245).

contemporary proponents of an "extended evolutionary synthesis" (EES): the transformation of evolutionary theory by the introduction of statistics and population genetics (Merleau-Ponty 2003, p. 252; Depew and Weber 1995, pp. 10-11). This criticism echoes, *avant la lettre*, those lodged by the proponents of the (EES) against the defenders of the "modern" or "new synthesis" (MS):

> In our view, the MS [modern synthesis] was founded on tenants that, while useful heuristics for advancing biological theory at the time, are now known to be anachronistic. These tenants include the legitimacy of neglecting developmental processes thereby allowing evolution to be studied by population genetics alone and a focus on a single level of ultimate causation. These tenants fail to fully address biological organisation, and the EES arose precisely in response tot his deficiency. (Mesoudi et al., 2013)

In the very rough published notes on evolution and phylogeny from his *Nature* lectures, Merleau-Ponty attempts to furnish almost a list of examples of the incompleteness of the MS. To put this otherwise, his notes seem oriented toward undermining the two theses that sit at the heart of the MS, especially the second: "The first thesis is that overwhelmingly the most important cause of the adaptation of organisms to their environment, or conditions of life, is natural selection. This is the heart of the Darwinism in Neo-Darwinism. The second thesis is that inheritance, at least as far as it is relevant to evolution, is exclusively mediated by nuclear DNA" (Dupré 2012, p. 144).

In the remainder of this paper, I will look at two aspects of the EES, niche construction, cultural niche construction in particular, and multi-dimensional inheritance pertaining to instinct. I choose these two because they coincide well with the criticisms that Merleau-Ponty makes of Neo-Darwinism and correlate with remarks that Merleau-Ponty makes about the intertwining of nature and culture and with his discussion of Lorenz's concept of "imprinting" (*Prägung*). My hope in drawing Merleau-Ponty's often vague remarks and notes on these matters into conversation with contemporary philosophy of biology is not simply to argue for a kind of empirical vindication or verification of what was earlier mere speculation. Merleau-Ponty also supported his claims with the results of empirical study. The introduction of

molecular biology into the story in the recent literature on the EES cannot be said to suddenly corroborate Merleau-Ponty's earlier claims, although it is indeed a further support of Merleau-Ponty's earlier criticisms of Neo-Darwinism and his attempt towards an expanded ontology of nature. Rather my aim here is to argue that the inflationary philosophy of nature, the insistence on reconsidering the relations between the "realist-causal" and the "idealist-motivational" dimensions of being to the extent of collapsing them could in fact show the way toward an ontology of nature that is adequate to the findings which have led to the EES.[11] This also seems to have been Merleau-Ponty's aim. In his notes he criticises both Darwinism and Idealism as correct in their objections to one another: "Darwinism is right to say that the problem is not first to explain why this, that we must show that the rest is eliminated […] Idealism is right to say that the actual is not, like a unique plane, without relief, sufficient." The positive content in Darwinism for Merleau-Ponty is that is recognises "a fecundity of life from which there is only pruning, a chance that uses everything."[12] The challenge for a new ontology will be to "place something in between chance and the idea," between Darwinism and idealism. This something is behaviour in its intertwining of latent and actual content: "the suturing of organism–milieu, organism–organism."

Both niche construction and the analysis of instinct and the genetic assimilation of learned behaviour as aspects of the EES lead to a reconsideration of the relations between "realist-causal" and "idealist-constituting" orders of being, insofar as both phenomena are illustrations of the integration of sense-structures – i.e. "institutions," a term that replaces

[11] See, "They [Darwinism and idealism] are right against each other" (Merleau-Ponty 2003 p. 251).

[12] "—but it [Darwinism] supposes a fecundity of life on the basis of which all that remains is to prune, a chance that utilizes everything" [*mais il se donne une fecondité de la vie à partir de quoi il n'y a qu'à élaguer, un hazard qui utilise* tout]. My translation differs significantly from Robert Vallier's (ibid.), which translates *élaguer* as unfurl, not prune. "Prune" is more fitting with the idea of evolution as a process of individuation. It also sits better with the remarks that Merleau-Ponty makes just previously concerning Bergson's and vitalism's attempts to think the emergence of another dimension into the horizontal or actual order. Merleau-Ponty's ontology seems to work the other way. The actual or horizontal order is an abstraction from a process of individuation, hence his appreciation for the idealist critique against Darwinism. (Cf. Merleau-Ponty 1995, p. 317).

"constitution" in Merleau-Ponty's thought – into evolutionary processes. In the final section of the paper I will offer a sketch of how these aspects of the EES could be ontologically grounded in the new ontology that Merleau-Ponty's project was endeavouring toward. If the EES is in need of an ontological grounding, the new ontology, with its emphasis on evolution (as putting the fabric of being into question) is in need of an evolutionary biology, if the EES can go some way in providing this we will be better able to arrive at an understanding of the contours and dimensions of this new ontology.

2.2 Niche Construction

In the rather coarse outline of niche construction theory that follows, I will rely largely upon the work done by Kevin Laland, John Odling Smee, Marcus Feldman, and Sean Myles, who have co-authored some of the most important research in the field. Niche-construction is broadly understood as: "the process whereby organisms, through their metabolism, their activities, and their choices, modify their own and/or each other's niches." A niche is defined as the "sum of all the selective pressures to which the population is exposed" (Odling-Smee et al. 2003, p. 419).[13] The area of niche construction that I am most interested in for the purposes of this paper is cultural niche construction, wherein the niche modifications occur as the result of cultural constructions.[14] Using evidence provided by mathematical modelling, Laland, Odling-Smee and Myles argue that "niche construction due to cultural processes can be even more potent than niche construction due to other (gene-based) non-cultural processes" with resulting effects on evolutionary processes and outcomes (Laland et al. 2010, p. 140).

What I want to argue here is simply that cultural niche construction theory and gene-culture interaction show that intersubjectively constituted sense-structures enter the evolutionary processes of populations as operative factors in those processes by impacting upon or structuring selection pressures and selective environments. The outline of the argument made by Laland et al. is

[13] Okasha (2005) objects to this broad definition of niche-construction, preferring instead a narrower definition wherein niche-construction is limited to an organism's modification of its own, or its population's niche.

[14] Culture is defined here as "information that is capable of affecting individuals' behaviour, which they acquire from other individuals through teaching, imitation and other forms of social learning" (Richerson and Boyd 2005, p. 5).

that cultural practices, which consist of ideal cultural objects, alter the environment of the population in which the practice has emerged. In doing so, the cultural objects/practices exert an influence on selective pressures within the cultural environment. In this way the cultural objects/practices imprint themselves into an evolutionary process that impacts the phenotypes of subsequent generations, in some cases making the population more phenotypically amenable to certain cultural practices.

The best-documented example is the practice of dairy farming. The argument here is that counter to the idea that dairy farming is more prevalent in geographical areas with a higher prevalence for lactose tolerance, the practice of dairy farming exerted selective pressure on the population, leading to a higher frequency of alleles for lactose tolerance (Laland et al. 2010, p. 145). Due to the robustness and reliability of transmission of cultural objects several theoretical biologists have postulated that there is good reason to suspect that cultural niche-construction has been not just a general feature of human evolution, but "could be the dominant mode of human evolution" (see, Laland et al. 2010, p. 137; also Laland et al. 2008).

Niche-construction offers strong arguments in favour of the intertwining of sense-structures and biological mechanism in evolutionary processes. I believe that it does so to an extent that any effort to think the processes of human evolution at least outside the context of this intertwining of culture and biological mechanism is an abstraction. As Okasha points out, this abstraction may have been necessary to establish the modern synthesis, but it is can no longer be justified insofar as it leaves out a significant dimension of evolutionary reality (Okasha 2005, p. 1). But to stop at the fuzzy contours of culture is to repeat this earlier misstep. Culture does not seem limited to humans, and it seems question begging to draw an arbitrary line in terms of where within the domain of life sense-constitution in a manner relevant to evolutionary processes (as niche-construction postulates) first emerges. Prima facie it seems difficult to say that sense would not go all the way down so to speak, i.e. why all niche construction insofar as it entails a behavioural "suture" between organism and milieu and organism and organism does not implicate sense-constitution. Organisms participate in niche-construction (alteration of the selective pressures in their environment) through behavioural interaction between one another and with their

environments. Behaviour must be parsed through meaningful relations irreducible to reflex mechanism. This applies not only to the cultural constructs of humans and higher mammals, but rather to all behaviour. Sense-structures in this fashion enter into and modulate evolutionary processes. This line of argument rests on the premise that organismic relations with the selective environment (including, perhaps most importantly, other organisms) are meaningful and not reducible without abstraction to physical or chemical explanation; an argument that we find in von Uexküll, Goldstein, Merleau-Ponty and Canguilhem, as we saw in the previous sections.

2.3 The Institution of an Instinct

In order to shore up this premise, I turn to the account of the relation between instinct, learned behaviour and evolution. For the sake of efficiency, I will compare Merleau-Ponty's discussion of Lorenz's instinct theory in the *Nature* lectures and the lectures on *Institution and Passivity*, with critiques of Lorenz that were contemporary with Merleau-Ponty's study and also the evaluation of instinct and the genetic assimilation of learned behaviour within Jablonka and Lamb's account of extended evolutionary theory in their *Evolution in Four Dimensions* (2005).

Merleau-Ponty's analysis of Lorenz's results pivots unsurprisingly on the three interlinked concepts of behaviour, latency and style. The idea of an institution of an instinct, which Merleau-Ponty puts forward in the lectures on institution, is already somewhat heretical even to the position he put forward in the introduction to his first course on the concept of Nature in 1956-57. Nature, Merleau-Ponty writes, "is what has meaning, without this meaning being posited by thought: it is the auto-production of meaning. […] Nature is the primordial, that is the unconstructed, the noninstituted" (Merleau-Ponty 2003, pp. 3-4). But the discussion of "institution in life" and of instinct as an instance of institution tells us that he was already thinking about institution qua meaning formation outside of subjective sense formation (thought), or that we must give thought a very wide berth.[15] In

[15] Cf. "Observing a squid meeting a predator: the recoil movement, agitation of the tentacles, the jet of ink, the taking advantage of the few seconds given by the blindness of the attacker to escape and find a hiding place, honestly, would we not call this thought" (Prochaintz 1997, p. 159, my translation – DM)

other words, institution was on its way to becoming a central facet, insofar as the concept interacts with both latency and behaviour, of Merleau-Ponty's philosophy of nature and indeed his ontology. Put simply, an institution is a sense-development that individuates a style of behaviour such that it orients the modulation of that style; future developments refer back to a history of institutional modulation. What Merleau-Ponty's analysis of Lorenz's studies of instinct is meant to show is the extent to which an instinct cannot be thought of as innate or pre-existing its institution in a behavioural development: there is no pure innateness – no pure instinct (Merleau-Ponty 2001, p. 49). What Jablonka and Lamb's analysis, which builds on criticisms of Lorenz contemporary to both him and Merleau-Ponty, demonstrates not only supports this thesis, but also shows how a learned behaviour or institution in Merleau-Ponty's terms is integrated into evolutionary process, something Lorenz rules out.

Merleau-Ponty's reading of Lorenz's concept of "imprinting" (*Prägung*) emphasizes the dimension of latency present in even instinctive behaviour and criticizes any attempt to separate the organism or even the species from "the confluence of an internal and external assembly," what he called elsewhere the "suture" between organism and environment – both of these phrasings are question begging insofar as they presuppose what it is that they are meant to bring into question, i.e. the ontologically discrete organism. It would be better in this instance to qualify that the organism is not a priori but premised or antecedent upon relations within an environment from which an "internal" and an "external" are consequent, and hence an organism with a functional territory can be posited. The aim of Merleau-Ponty's analysis of Lorenz is to demonstrate that even what we call instinct is not a innate fixed response on the part of an organism to certain pre-determined environmental stimuli, but rather part of a meaningful set of symbolic relations that is formative of – institutes – the organism as a level within an ecological context.

Merleau-Ponty is attracted to Lorenz's analyses for both methodological and ontological reasons, which intermingle. Firstly Lorenz's insistence on the importance of in situ observation of animal behaviour over and above laboratory experimentation fits with the general phenomenological approach that Merleau-Ponty took to the sciences (as discussed in the beginning of this paper). Second, Lorenz's understanding of behaviour as a morphological

character of an organism, akin to a physical organ holds with Merleau-Ponty's behavioural approach to phenomena and to the analysis of behaviour in terms of meaningful relations not causal, physical mechanism – a point which he emphasizes in his reading of Lorenz: instinct as a modality of suture between organism and environment displays a structural flexibility that belies both mechanism and idealism (that the species has an essence). As a morphological character, instinctual behaviour could be in some cases the means for distinguishing species (Merleau-Ponty 2003, p. 190). Finally, even Lorenz's neurological reductionism, which was not a reduction to causal mechanism, aligned with Merleau-Ponty's research programme. As Merleau-Ponty was attempting vis-à-vis the study of nature writ large, Lorenz's study of instinct attempted to steer a path between "purposivists ('vitalists') and the reflex theorists ('mechanists')" (Griffith 2004). Merleau-Ponty does not mention Lorenz's strict distinction between instinct and acquired behaviour, brought into question already in the 1950s through reference to evolutionary theory. I do not think that this is commensurate with Merleau-Ponty's proposed ontology and its exclusion from mention may be part of his (rather frustrating) pick and mix approach to dealing with other philosophers. Lorenz's distinction might also serve a methodological purpose of its own for Merleau-Ponty insofar as it separates learning and instinct but retains the concept of sense or symbolism as primary in the sphere of instinct.

At the core of the analysis lie two ideas: (1) that an instinct is "without object" (*objektlos*) and (2) not mechanical or reflex response to external stimuli. Rather, an instinct is the "manifestation of a certain (species specific) style" of behaviour, which is why Merleau-Ponty says elsewhere that species themselves are styles. To say that an instinct is without an object is not to say that instinctual behaviour does not for the most part have "defined constellations of external excitants" (Merleau-Ponty 2003, p. 192). But this does not mean that the relation between environmental stimulus and behaviour is determined. Environmental cues "actualize a certain style of behaviour," i.e. triggers bring forms of behaviour latent in the morphological characteristics of the organism to manifestation. The trigger, Merleau-Ponty is careful to point out, is not a cause but "evocative of an innate complex." The use of the term innate – inborn orientation toward specific forms of complex behaviour – here indicates that Merleau-Ponty still grants an epistemic and ontological priority to the organism as an ontological level of explanation.

From this follows the claim that the organism has in its form (morphology) latent patterns of behaviour that "meet up with" affordances in the milieu which draw the latent content to manifestation. In this sense, instincts do not have goals (which would make them object directed) but are pleasurable activities, if they can be said to have an aim it is satisfaction, an idea which echoes Deleuze's notion of instinct from his 1955 essay *Instinct et Institution*, a piece concurrent with Merleau-Ponty's own bringing the two terms into conversation with one another in his 1954-55 lectures.[16]

If the relation between the environmental constellation that functions as trigger and the manifest style of behaviour is not reflexive/mechanical, Merleau-Ponty is clear that it should be understood "symbolically" – the trigger is an "idea" (Merleau-Ponty is following Ruyer here). The behaviour—trigger relation does not admit to mechanical analysis because it is too flexible. There is no one-to-one causal relation between stimulus and response, but rather a meaningful and formal relation in the incitement of one style by another. The flexibility of instinct is attested to in the fact that no exactness – although instinctive behaviours do rely on "complex and highly specific environmental cues" (Griffith 2004, p 611) – is necessary from the environmental stimulus. If a certain perceptual aspect of the trigger is absent it can be compensated for by the exaggeration of another. This is what Merleau-Ponty (and Lorenz) believed Tinbergen's "supranormal stimuli" Herring Gull chick experiments to show.[17]

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[16] See, Deleuze (1955); Merleau-Ponty describes instinct as "a tension that wants to find relief without knowing why, it does not aim so much at the real as the irreal" (Merleau-Ponty 2003, p. 193).

[17] Tinbergen used props that did not resemble a mother's beak but contained exaggerated characteristics that would also be found on a real beak to stimulate instinctive behaviour in Gull chicks. See, Tinbergen (1953). Tinbergen and Lorenz used these findings to develop a theory of "fixed action pattern" that Merleau-Ponty discusses in some detail in his lectures as "stereotype" behaviours. "Fixed action pattern" denotes a species specific and largely invariant action that is almost always carried through to completion. Tinbergen's experiments purported to show that these patterns could be elicited by non-exact stimuli (models). The concept of "fixed action pattern" is now largely abandoned in biology and ethology. But the corresponding concept of superstimuli is still used in evolutionary social science (see de Block and de Laing 2010)

The flexibility and symbolic character of instinct is further attested to, for Merleau-Ponty, by Lorenz's theory of "imprinting" (*Prägung*).[18] Lorenz's theory of imprinting was derived from observations that young geese when exposed at a particular stage of development not to their mother but to another object, in this case Lorenz himself, would imprint upon the new object the signification that would normally hold for the mother. Hence Lorenz's goslings would follow him around as if he were their mother. As the theory goes, there is no operative "as if" in the relation. The meaning of the mother had been imprinted on Lorenz. For Merleau-Ponty these findings demonstrated that the object of the innate scheme was not "foreseen" by nature. Its sense was acquired as an institution, which then individuated, in the sense of constrained, the development of the relations the bird could have with other animals. Lorenz observed that animals that became fixated on other species lost their interest in their own. This too was important for Merleau-Ponty: the sense construction that was instituted in the imprinting was not specific to an individual, but rather to a species. This linked with the other point of agreement between the two, that species were to be defined phenomenologically in terms of manifest styles of behaviour. The species appeared "in filigree" in the behaviour of the animal. The instinct in Merleau-Ponty's reading then became an "empty" schema, which was filled by the institution; for him this confirmed that "[w]ith empty activity, instinct is going to be capable of being derailed or is going to pass from instinctive activity to *symbolic activity*" (Merleau-Ponty 2003, p. 195). The instinctual life of the animal, far from being a life of specific inborn mechanisms is a life of meaningful relations between the animal and its environment, and most importantly, other organisms as parts of the environment.

Merleau-Ponty does not mention the terms "innate releasing mechanism or "fixed action pattern", though he does make note of the "mechanist side of Lorenz's thought" attributing it to the Tinbergen's influence. He also uses the expression "stereotype," a possible synonym for "fixed action pattern," in noting that the instinctive behaviour is not fixed in relation to an object, but is "an attempt to resolve an endogenous tension" – an understanding that he

[18] The phenomenon that Lorenz describes with this term was first described and analysed by English biologist Douglas Spalding. Merleau-Ponty seems not to have been familiar with this, although J.L. Haldane, who was highly critical of Lorenz on both political and biological grounds, reprinted Spalding's article in 1954.

borrows from Freud's theory of drives. The "innate releasing mechanism and "fixed action pattern" are two moments of the instinctive response, the first being an innate system within the animal that responds to a stimulus, the second a pre-determined and fixed behavioural response. Both are endogenous to the organism. Both concepts have also since been abandoned in contemporary ethology. The conceptual coupling was also part of the mechanistic side to Lorenz's thought that Merleau-Ponty sought to underplay. In fact his analysis seems to straightforwardly contradict these concepts. The instinctual response is a latent style of behaviour that is evoked, not caused, by a trigger which rather than being the stimulus for a mechanical response is an "idea," the trigger is itself a style or watermark in the environment, hence the possibility of imprinting. And finally the instinctive behaviour displays at its core no pre-determination in a strict sense: "instinct is constituted rather as a systemic elaboration of the world than as a reference to an entirely constituted exterior world." The similarity of instinctive behaviour across conspecifics does not indicate only a common biological causal mechanism of instinct, but a shared style of behaviour that is what constitutes the species (phenomenologically). This also gives us reason not to lean toward a finalist interpretation of the rejection of mechanism in instinct. There is no spirit of the species. Rather the species should be construed in terms of a dialogue between organism and environment which takes on a specific style. Behavioural rituals are not there because they allow for a selection between animals of the same species, this would be to put the cart before the horse; the ritual, in part, is constitutive of the species. The meaningful relations that an animal has, at the level of instinct, with its environment (including other animals) allow us to speak of an "animal culture." We don't arrive at this concept of culture by derivation or deduction from human culture: activities x, y, and z, resemble human culture and so we can deduce that animals also have culture. Instinct is proto-culture. The concepts of latency, style and expressive behaviour that mark the analyses of "higher forms" of culture are through and through *natural concepts*. The analysis of instinct is indicative of what Merleau-Ponty is attempting to show in all of these lectures: reduction of nature to idea or mechanism impoverishes our ontology and forces us to turn a blind eye to the phenomena. What instinct makes manifest is a "third order" of being, which is in fact the first order of being, from which the causal-mechanist and motivational-idealist orders are but abstractions.

Merleau-Ponty ends the section on Lorenz with a comment that he makes in several lectures during this period: the overall aim of his investigations is φύσις – λόγος – history. It is curious then that he makes no note of the fact that his insistence that Lorenz's analysis of instinct allows us to "speak in a valid way of an animal culture" seems to directly contradict Lorenz's insistence on the separation of learned and instinctive behaviour, that there are "neither ontogenetic nor phylogenetic transitions between innate and learned components of behaviour," a distinction rooted in the conceptual coupling of innate releasing mechanism and fixed action pattern, but also in his training in morphology.[19] It is possible that this omission is the result simply of Merleau-Ponty's pick and mix approach to dealing with other philosophers (we must also take into account that these are lecture notes not published pieces). But it could also have something to do with the fact that Lorenz considered instincts to be morphological traits that were "[conservative] morphological characters in the course of evolution."[20] This behavioural approach to species taxonomy accords with Merleau-Ponty's own vague articulation of what a species is: a style of behaviour. Lorenz's rigid separation of instinct and learned behaviour (culture) might have also, paradoxically, suited and supported Merleau-Ponty's attempt to argue for a symbolic life of the organism from the bottom up, so to speak. Lorenz's isolation of learning from instinct, his denial that they could ever be homologous, did not in this circumstance have to be read as an isolation of sense or symbolic life from organic function – although Merleau-Ponty's reading likely is against the grain of Lorenz's intentions. The point is that Merleau-Ponty's philosophy of nature (as a way into ontology) clearly held that the symbolic life of the organism could be traced from language, learning and communication, through instinct and back into embryological morphogenesis. Just as Okasha argues that an artificial level of abstraction might have been necessary to establish some of the basic concepts of evolutionary biology, so too Merleau-Ponty *may have argued* that Lorenz's

[19] On the relation between Lorenz's background in morphology and his concept of instinct see, Brigandt (2005); and "The feature of Lorenz's instinct concept that distinguished him most clearly from his predecessors, and from almost all his contemporaries, was his firm and repeated denial that there are any gradual transitions between instinctive and 'intelligent' (learnt, flexible, variable) behaviours, either in the development of an individual or in the evolution of a lineage" (Griffiths 2004, p. 612).

[20] See Lorenz (1996) as cited in Griffiths, (2004, p. 627).

distinction was necessary to illustrate the symbolic life of the organism outside of learned behaviour. Nowhere, to my knowledge, does he make this argument.

In the years surrounding Merleau-Ponty's lectures Lorenz's analysis of instinct was being criticized, most notably by the British, Marxist biologists J.B.S. Haldane and Helen Spurway, as well as the American Daniel S. Lehraman. Following Lehraman's critique, Tinbergen also abandoned the idea of "innate behaviour", referring to it as "heuristically harmful." From the perspective of Merleau-Ponty's reading, it is curious that the attacks against the rigid distinction between learned and innate behaviour, attacks that Merleau-Ponty's work would seem to support, were made on the basis of the modern synthesis (MS), which Merleau-Ponty attacks in his lectures. The omission is made all the more curious by the fact that Merleau-Ponty refers to Haldane in his analysis of Lorenz and that Haldane and Spurway's critique of Lorenz and argument in favour of the genetic assimilation of learned behaviour and hence against the strict separation of the learned and innate behaviour seems much more in line with Merleau-Ponty's own research programme than Lorenz's cleavage of the two. In the article referenced by Merleau-Ponty, Haldane does not discuss the disagreement in detail, but certainly alludes to it (Haldane 1953, p. 64). Merleau-Ponty cites Haldane's use of the terms "mimetic exaggeration" and "ritualization," concepts general enough not to necessitate the reference unless Merleau-Ponty wanted to draw attention to Haldane's use of them.

Haldane's discussion in the article cited by Merleau-Ponty concerns the form of communication used by bees. Haldane's argument is that a direct comparison can be made between the symbolic behaviour of bees, specifically in dances uses to communicate the location of and effort required to reach honey or pollen at a distance of greater than seventy-five meters from the hive, and human ritual activity. Thus Haldane argues for thinking the symbolic behaviour of humans and that of animals as a continuum. But he is also careful to not posit intention in the bees' communication: "I assume it to be an unjustifiable anthropomorphism to assume either that X [the dancing bee] has the intention of informing Y [the dance watching bee], or that Y has a purpose to fly to a certain locality" (Haldane 1953, p. 67). Rather the communicative dance of the bee is an "intention movement": a prediction of future

movements, the ritual dance is a ritual preparation for the next flight of the bees, not a recounting of the last. Nor is it a purposive action in the sense of intending to "bring about a future state of affairs which can be imagined or envisioned by its performer, or to prevent such a state affairs" (Haldane 1953, p. 63). Haldane's discussion of ritual is important in the context of Merleau-Ponty's understanding of instinct and more generally of nature in that it argues for symbolic activity in nature outside of the scope of purposiveness, and furthermore places human symbolic behaviour in a continuum with other forms of sense-making in nature.

Haldane and Spurway argued for the assimilation of learned symbolic activity into genetic evolutionary processes. Haldane jibed Lorenz in this regard not for ignoring evolutionary theory, only the past thirty years of it. In their account of the extended-evolutionary synthesis Jablonka and Lamb provide a contemporary account of genetic assimilation of learned behaviour (Jablonka and Lamb 2005, pp. 289-292). Using the example of birdsong, they present a scenario wherein sexual selection for a learned behavioural trait coupled with an environment where the same trait increases vulnerability to predators will create an adaptive advantage for individuals better predisposed to learning the trait with speed and minimal practice. Where beautiful songs are sexually advantageous, but also expose the singing birds to greater risk predators, those animals that need to waste the least time learning and practicing will have a selective advantage. Over successive generations the genetic propensity for rapid uptake of the advantageous learned trait will be selectively honed to the point where the animal presents a style (in Merleau-Ponty's terms) such that learning the behaviour requires minimal environmental cues or input. In such situations, the learned behaviour, or the requisite phenotypic style – in the sense of orientation or openness toward the acquisition of certain kinds of sense structures – is said to be genetically assimilated. The environmental cues are still necessary, but the bird has been evolutionary stylised for an affinity toward certain forms of communication (specific songs).

Here, I think that Merleau-Ponty's notion of style, so important to his analysis of instinct, helps to clarify the sense in which a meaning structure is genetically assimilated and phenotypically expressed over subsequent generations. The assimilation is here again a matter of the suture between

environment and organism. Some cue is necessary for the general style of an organism to be individuated in terms of the specific symbolic activity that the style opens onto; and if the behaviour ceases to present an advantage to the animal it will in theory be gradually unassimilated (if for example the predatory threat vanishes, giving an advantage to birds who take more time to perfect their songs). Haldane's account of ritual communication and the corresponding theory of genetic assimilation postulate one way in which sense-structures – institutions – can be assimilated or perhaps intertwined is indeed the better word here into evolutionary processes.

Conclusion.

The two examples of "extended" evolutionary processes – cultural niche construction and genetic assimilation of learned behaviour – that I have outlined here in relation to Merleau-Ponty's philosophy of nature both point to an inflationary conception of evolutionary process, i.e. a process that cannot be characterized purely in terms of physical mechanism coupled with selective processes. Both of these examples indicate the importance of "whole organism" relations between organism and environment in the constitution of evolutionary process, without any break with other forms of causation. Both also point to the central role of sense-structures or institutions in evolutionary process. The EES points us toward the collapsing of the abstract distinction between the realist-causal and idealist-instituting orders of being. To paraphrase Merleau-Ponty, a *scalar structure* of evolutionary processes allows for the integration of sense-formation into biological process *without any break with chemical, thermodynamic and cybernetic causation*. We see here the coming together of two ideas, one which marks the beginning of Merleau-Ponty's venture into ontology and the second which marks its premature cut-off. The first is that the way into ontology is through the relations between mind and body, an idea for which Merleau-Ponty credits Maine de Biran; the second that opening up evolution beyond mechanism and finalism brings the very fabric of being into question. In between these two markers, the concepts of style, latency, institution, concepts which methodologically find their origins on the mind side of the mind-body problem start to manifest themselves in the findings of developmental biology, showing that ontologically it is the individuation of these concepts, or better the fields that these concepts name that form the mind-body problem in the first place. The mind-body problem

shows the way into ontology, but the study of behaviour, revelatory of the concepts of style, latency, institution, shows that the mind-body relation is a consequent, itself an individuation in an evolutionary history of being that developmental and evolutionary biology are beginning to uncover as they rethink the conceptual basis of the neo-Darwinian modern synthesis, but which they still, to some extent lack the conceptual resources to characterize, precisely due to a sedimentation of the mind-body problem in contemporary ontology. Having seen this dynamic, the project that Merleau-Ponty was engaged in at the time of his death could well be characterized as an attempt to furnish and develop these concepts.

A "scalar structure of reality" that allows for assimilation or enveloping of processes of sense-formation and development into evolutionary ones, does not however fully address the question of the constitution of "'organo-formative' territories which impinge on one another and possess a periphery beyond their focal region" and which posits individual organisms and species as "traps for fluctuation." The further elaboration of these highly suggestive ideas is certainly the next and will be the most challenging stage in continuing the project of a philosophy of nature that Merleau-Ponty sets out in his last lectures. Perhaps the most suggestive idea here is that we give up the idea of discrete organisms as having ontological priority, even while proceeding methodologically from a behavioural analysis of the organism. This paradox is perhaps maintainable if we replace our thinking of discrete organisms with thinking about "territories" that exert formative power both spatially and temporally – as I think both the analyses of niche construction and instinct/genetic assimilation of learned behaviour shows. Such territories would manifest structural stability within an ecosystem of powers qua flows of latency. But the stability of a territory as a structurally stable configuration of flows of latency is not static; precisely the opposite: here we grasp the meaning of thinking structural stabilities as "traps for fluctuation." The structural stability provides precisely the background against which fluctuation can be perceived. The idea of organo-formative territories helps us to move from a biological ontology of entities, to one of nested ecologies, where scales must be thought in terms of time as well as space, where the non-exhaustion of the antecedent power in the ecological dynamics gives temporal depth to what I have called flows of latency. For those interested in pursuing the project of a philosophy of nature that is sketched out so

suggestively in Merleau-Ponty's last texts, and that is, I think, also brought into clearer focus in relation and confrontation with evolutionary theory – which brings the very fabric of being into question – these concepts are the watermarks to follow.

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