Deleuze, Darwin and the Categorization of Life

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**I. Introduction**

In the years following his trip on the *HMS Beagle*, Charles Darwin challenged the meaning of variation within living things, formulating his theory of evolution by natural selection to explain the diversity of characteristics living things possess. Since that time, evolutionary biology has incorporated Mendelian inheritance and the relatively new field of genetics to offer better explanations for the origins of new species and novel individuals. A century after Darwin, Gilles Deleuze qualifies and resituates, without opposing, philosophies of ‘univocal being’ in which ‘Being is said in a single and same sense of everything of which it is said’ (Deleuze 1994: 36) within his larger ‘philosophy of difference’. As Deleuze himself recognizes, there are a number of points of convergence and divergence between these two theories in their explanations of how difference appears and operates within the world. Both theories reject a typology that classifies entities into universal, absolute categories and propose a system by which new beings and new differences can come into existence; yet Darwin stops short of privileging differences over individuals, and instead provides the notion of species with a sense of ontological stability incompatible with Deleuze’s concept of individuation. Darwin references individual differences rather than taxonomic structures, but from a Deleuzian perspective, Darwin’s use of the categories of individuals and species presupposes processes of individuation that constitute individuals which can subsequently be sorted into species. This paper examines these similarities and differences between Deleuze’s philosophy of difference[[1]](#endnote-1) and Darwin’s theory of evolution, focusing on Deleuze’s compliments and criticisms of the Darwinian project. Deleuze critiques Darwin because the Darwinian concept of difference is ‘difference inherent in individuals’ rather than ‘individual difference’, a concept that leads Darwin to inaccurately assume that difference occurs within individuals and within species whereas a true philosophy of difference claims individuals and species develop through processes of individuation. Deleuze’s philosophy of difference borrows from Darwin the critique of hierarchical classification schemes that substitutes a dynamic model, but radicalizes Darwin’s theory by disrupting even the ontological stability of species and extant individualities. Since there have been several important shifts in evolutionary biology since Darwin, this paper also examines how Deleuze’s project relates to two more recent developments within the field, punctuated equilibrium and the discovery of the amount of genetic variation within the human genome, focusing on whether the Deleuzian critiques of Darwin’s version of evolution are still applicable. These recent developments within evolutionary biology make the Deleuzian critique of Darwin less applicable to contemporary evolutionary studies, as these discoveries have shown that the Darwinian classification schemes are in need of revision to include a greater openness to difference. While a complete alignment between evolutionary biology and Deleuze may be impossible given the technological and structural limitations of evolutionary biology, at the very least evolutionary biology can rethink the ontological permanence it gives to the categories of species and individuals.

**II. Deleuzian Ontologies**

A preliminary difficulty confronting this project is the variation between Deleuze’s ontologies as expressed in *Difference and Repetition*, *A Thousand Plateaus*, and even *What is Philosophy?*, for how Deleuze situates and explicates both processes of individuation and their relationship to species and extant individuals shifts as Deleuze modifies his project. It is worthwhile to recall some of the differences between these works before moving into a direct comparison of Deleuze, Darwin, and contemporary evolutionary biology. One of the most popular characterizations of Deleuze, made by Alain Badiou and Slavoj Žižek among others, is that Deleuze’s ontology works out into a transcendental idealism inasmuch as it reinstates a ontological divide between the immanent and the transcendent. *Difference and Repetition* and *Logic of Sense*, according to this analysis, set up a ontological system where subjective processes precede and condition experience, a system that starts with the empirical and seeks its necessary transcendental conditions.[[2]](#endnote-2) As Deleuze desires to escape subjectivity and the focus on the immanence of appearance that characterizes phenomenology, Deleuze’s early work is aimed at developing a transcendental critique of representation that draws from Kant the notion of synthesis and production in order to explain the conditions necessary for the possibility of the real. Yet Deleuze wants to avoid entirely accepting the Kantian position, and so posits that the syntheses which produce the real are not subjective constructs but are embedded in the very production of reality rather than in the manner in which it is represented. Alistair Welchman’s commentary on the project of the early Deleuze says ‘Deleuze effects a speculative reconstruction of reality that is not relative to specifically human interests, … a reconstruction driven by the transcendental and critical thought that the real processes of production of empirical objects cannot themselves be objects’ (Welchman 2009: 32). *Difference and Repetition* portrays the processes that produce objects as transcendental and outside the bounds of immanence for the purposes of situating them as conditions of reality rather than elements of reality itself. In studying these processes, Deleuze’s investigation begins in the empirical realm and gradually traces back to their transcendental conditions; it keeps a foot in the field of experience, and in doing so essentializes the nature of the empirical just enough so that Deleuze is never able to fully escape a concept of subjectivity nor a presupposition of the products of the transcendental processes being described. *Difference and Repetition* depends on a form of subjectivity, as in its description of the syntheses of time it posits ‘larval selves’ that think about and draw together temporality in order to ground it (Deleuze 1994, 78). Such larval selves are fragmented pieces of subjectivity spread out across the organic stratum, and as such they are in part necessary for the constitution of temporality as it is consciously apprehended. The fact that, as Welchman says, ‘… it appears that living/lived time is still *constituted* by contemplative subjects/selves …’ (Welchman 2009: 43), indicates that the subjective constitution of representation that was the hallmark of Kant’s transcendental idealism is not completely absent from Deleuze’s early ontology.

Yet this changes in *Anti-Oedipus* and *A Thousand Plateaus*, where, in partnership with Guattari, Deleuze resituates the transcendental as a process within the materiality – which Deleuze defines as desiring-production – of the world. The fundamental difference in method is that whereas in *Difference and Repetition* Deleuze began from the empirical, in *Anti-Oedipus* and *A Thousand Plateaus* Deleuze begins with the transcendental, or with the notion that experience is constituted. Deleuze does not work back to the syntheses, but begins with the notion of synthesis by seeing it as immanent within the empirical. One does not have to leave the empirical to get to the transcendental conditions – they are completely contained within it. The clear difference in ontology is that there is no need for a metaphysical subject, no need to ground the transcendental within the organic stratum; the transcendental now comes part and parcel of the materiality of the world. In explaining this relationship with regards to temporality Welchman says,

Nevertheless, two important changes are obvious: in the first place, the role and position of anything like the subject have changed; and, in the second place, the syntheses are no longer understood as constitutive of temporality. Underlying these changes is a modification of Deleuze’s basic strategy from attempting to ground his thought on a transcendental constitution of time dependent on the organic stratum to a kind of temporalisation (schematisation) of logical operators into a transcendental conception of matter (Welchman 2009: 49).

Temporality, which in *Difference and Repetition* had been conceived of as dependant in part on a mode of subjectivity, becomes, in *Anti-Oedipus* and *A Thousand Plateaus*, caught up in the understanding of matter as desiring-production. In making this shift, Deleuze extricates himself from a transcendentally constituting subjectivity.[[3]](#endnote-3)

Deleuze’s attempt to supplant Darwinian evolution refers to a constituting plane that precedes individuals, as the failures of Darwinian evolution, from a Deleuzian perspective, come from its attempt to adhere to the stability of individuality and species as ontological forms, a failure which Deleuze works to overcome by uncovering the transcendental condition for individuals, species, and other kinds. How successful this attempt is, and how much it separates itself from the contemporary field of evolutionary biology, depends in part on where such transcendental conditions are located. This point can be made clearer with a discussion of Deleuze’s critique of the category of species in *Difference and Repetition*.

**III. Deleuze, Darwin, and Speciation**

Because of the problem associated with previous means of representation – that it subjugates difference to a larger unity, but only by assuming the unity rather than demonstrating it (Deleuze 1994: 33) – Deleuze argues for the primacy of individuation over species, or of the need for science and other related discourses to deal first with the conditions for the appearance of the singular individual and second with that individuals’ categorization. The reason for this is that processes of individuation have ontological priority over species, as the very idea of species presupposes the existence of individuals, constituted by processes of individuation, which can be sorted into categories. Not only do species presuppose individuation, but species presuppose that individuals constituted as such are open to change through sensation and intensity (Deleuze 1994: 247). It is clear that Deleuze inherits this concept from Gilbert Simondon’s examination of the genesis of individuals, where Simondon posits the necessity of a principle of individuation in order to properly situate the individual within the study of the growth of organisms.

*Research carried out under these assumptions [that individuation need only be studied in regards to an individual’s characteristics] accords an ontological privilege to the already constituted individual.* Such research may well prevent us from adequately representing the provess of ontogenesis … *The idea that individuation might have a principle at all is a crucial postulate …* (Simondon 1992: 298; italics in original)

Simondon opposes any study of organisms that begins by conceiving of the living individual as a constant essence, a unity incapable of fundamental disruption. He articulates as an alternative a study of the preindividual, or the processes of individuation that provide entities and relations their eventual fixity. Albert Toscano’s excellent study of theories of individuation in *The Theatre of Production* emphasizes how this study is a necessary condition for any other scientific study, saying

Simondon proposes we turn to a domain – that of the preindividual – where neither relationality nor individuality can be branded with the fixity that would allow them to be subjected to a logic of predication. To comprehend the genesis of individuals … is therefore inseparable from the task of thinking the genesis or constitution of the relation itself (Toscano 2006: 137-8).

Individuation, as the study of the processes that give determination, predicates, and fixity to entities and relations one encounters, does not assume the individual but seeks the conditions of its formation. By definition it also does not assume speciation or the particular grouping of organisms along the lines of genealogy and inherited traits. For both Deleuze and Simondon, species are an illusion patterned onto the appearance of individuals via individuation. Whatever their utility in a scientific sense, they do not provide the tools for judging individuals in terms of their uniqueness and precise configuration. But it would be a mistake to think Deleuze’s system of individuation exactly copies that of Simondon, for Deleuze, unlike Simondon, refers his system of individuation back to differentiality and multiplicity, thus finding a way to describe the beginnings of a system without recourse to preconstituted individualities like Simondon’s preindividualities (and, arguably, the larval selves of *Difference and Repetition*). Simondon disassembles the ontological primacy of the individual, but does so by referring to the ontological order of a principle that constructs individuals in a certain way. Deleuze, by contrast, posits multiplicities that do not count as units, principles, or universals, and which as a result are constantly open and productive of difference (Toscano 2006: 162). Unlike the Aristotelian ontology which designates the categories as prior to and more essential than individuals (Aristotle 1984: 1037b29), Deleuze is able to conceive of individuals apart from any categorical apparatus by looking at processes of individuation, and as a result the necessity of having an ordering concept or image prior to the individual disappears.

It is not the individual which is an illusion in relation to the genius of the species, but the species which is an illusion – inevitable and well founded, it is true – in relation to the play of the individual and individuation (Deleuze 1994: 250).

Scientists and philosophers have continually resorted to the method of categorizing objects, ideas, faculties, and other existents through generalized groups as in doing so they are able to develop a useful knowledge that seems to explain the nature of the world they inhabit. Deleuze’s concern comes from the fact that the knowledge developed hides the more basic phenomenon of individuation. To use the language of species before one has understood the processes that constitute an individual is to conceal life as it actually is. Deleuzian biologist Stanley Shostak makes a similar point in *Evolution of Sameness and Difference: Perspectives on the Human Genome Project*, saying that to use characteristics to understand and classify beings before really understanding how individual beings are constructed leads to absurdity

In the epistemology of life, nothing ranks higher than sameness for communicating, especially communicating ideology with conviction. As a consequence, many patently absurd assertions about life go unchallenged in ‘ordinary science’ and are only elevated in ‘revolutionary’ science: molds and mosses have a thallus (even if their thalli are the same only in word); Embryophyta and Metazoa produce embryos (with nothing whatsoever to recommend the comparison); head, thorax, and abdomen, appendages, jaws (mandibles, maxillae), and limb (trochanter, tibia, etc.) exist in insects and vertebrates (sharing nothing more than their names) (Shostak 1999: 39-40).

Shostak believes the problem with science emphasizing sameness is that it posits sameness without considering whether the category is warranted, and either ignores or hides the important role difference plays in constituting the unity of life. Species, as units of biological classification defined by a similarity of characteristics – conventionally, the ability of individuals within that group to interbreed – are an example ‘par excellence’ of this problem, and the reason why Deleuze’s critique of Darwinian evolution will focus in large part on speciation[[4]](#endnote-4).

Realizing the limits of species indicates that a proper conception of difference and the correct organization of series needs to open itself to chance, to an evolution of forms, leaving behind restrictive regimes of representation. This does not mean that categories like species or divisions by kind need to be abandoned, but they cannot be taken as ontologically sound.

The principle of degradation obviously does not account either for the creation of the most simple system or for the evolution of systems (the threefold difference between biological systems and physical ones). The living therefore testifies to the existence of another order, a heterogeneous order of another dimension – as though individuating factors or the atoms taken individually with their power of mutual communication and fluent instability there enjoyed a higher degree of expression (Deleuze 1994: 255).

In a sense, Deleuze is trying to rehabilitate a sense of creativity at the heart of reality – an opening to becomings and differences that opposes a causal or deterministic worldview. Viewed from this perspective, *Difference and Repetition* is a response to a realist understanding of the world that sees the actual as all there is and claims the only task for philosophy and science is finding the proper categories and representations to understanding the world. Deleuze’s reference back to the differences underlying and conditioning representation does the work of instilling the world with a creativity which cannot be subjugated to similitude, as there is no way to take them up into an already existing category.

Before moving on to a discussion of Darwin and contemporary evolutionary biology, it is important to review the conceptualizations Deleuze gives science throughout his corpus, so as to be in a better position to see just how well contemporary evolution fits into Deleuze’s ontology. Although I have so far been primarily discussing *Difference and Repetition*, because that work never provides science as a whole a theoretical formulation, Deleuze’s other works must be taken up. What is relevant within *Difference and Repetition* is what is discussed above – the critique of similitude, the call for a study based on difference, and the search for the transcendental conditions of the real. These characteristics, understood in broad strokes, continue to hold true in Deleuze’s later work with Guattari *What is Philosophy?* The primary difference between the two works – at least in regards to scientific knowledge – is the relationship that philosophy has to science, for *Difference and Repetition*, beginning as it does in the empirical, implies that the conceptuality of philosophy must begin from the same starting point as science. From that point, philosophy delves into the transcendental conditions, while science articulates the ontology and the relationality of the entities which have been constituted (inasmuch as such things can be studied empirically and, through a scientific methodology, given a degree of intellectual rigor).[[5]](#endnote-5) By contrast, *What is Philosophy?* claims that the difference between the two fields lies in their relationships to the infinite chaos, or differences, at the heart of being. Philosophy works on concept, providing a consistency to the chaos and bringing it all together to contain it; science works on functions and propositions, attaching itself to the chaos in order to grasp its operations. Science accomplishes this by slowing down the speeds of the chaos so it can draw up a schematic of it, one replete with formulas and variables. Science actualizes the plane of immanence, in part by describing relationships and mechanisms that illustrate how objects, forces, and elements behave within specific environments. Evolution by natural selection, as a model for understanding the production and perpetuation of variation within populations, operates as such a mechanism. Because of the approach science takes to the infinite chaos it is unable to ever grasp the whole of being; instead, by its very nature, it produces breaks and discontinuities – blind spots that science recognizes as thresholds beyond which it cannot function.

It is not only the diversity of these limits that entitles us to doubt the unitary vocation of science. In fact, each limit on its own account generates irreducible, heterogeneous systems of coordinates and imposes thresholds of discontinuity depending on the proximity or distance of the variable … Science is haunted not by its own unity but by the plane of reference constituted by all the limits or borders through which it confronts chaos (Deleuze and Guattari 1991: 119).

Science allows a grasp on the world through the construction of grids and references (Deleuze and Guattari 1991: 127). The category of species functions as a frame of reference that enables a demarcation of the world, but the category runs into its limits when it tries to conceptualize the individual. The nature of science means that the truth of species is not absolute, but relative. Science is creative, but what it creates are determinations and quantities of information (Deleuze and Guattari 1991: 132). Describing science like this undermines arguments that portray science as the ultimate interpreter of how things are. Science adds important understandings to our collective knowledge, but it does not occupy by itself a privileged place among the various fields mobilized to engage with difference.

The limit of this reading of science to that talk of a science of functions and functives is to talk of a science expressed through theories, hypotheses, and axiomatic propositions; while true for some variations of science, there are other means by which science is conducted. Manuel DeLanda’s comparison of the Deleuze’s various ontologies makes this point clear, as ‘All the examples of ‘functives’ (the components of functions) given in WIP [*What is Philosophy?*] come from classical mechanics. No mention is made, for instance, of the operators of quantum physics, which use functions themselves as inputs and outputs’ (DeLanda 2002: 221-222). Recent discoveries within science have opened pathways to think of entities and forces outside the functive model, and are more open to the chaos which underlies it. In addition to the quantum mechanics DeLanda mentions, there is also new fields of computer modelling and contemporary models for evolutionary variation. The picture of science in *What is Philosophy* is the modern mechanics and dynamics of individuals like Darwin, Curie, and Einstein, but contemporary science is more adaptable to the organic, rhizomatic ontology Deleuze discusses in other works.

In *A Thousand Plateaus*, Deleuze and Guattari paint a different picture of what they call nomad or minor science. This science is contrasted to the royal or major science of axiomatic propositions, for while royal science deals with the field of exact and inexact, nomad science deals with anexact – that which is neither inexact or exact, but which expresses itself as a vague essence. While royal science works to describe, set out, verify, and segregate, nomad science follows, connects, flows, and problematizes. Whereas state science works out principles, nomad science opens itself to new problems, searching not for answers but opportunities for new encounters.

Royal science is inseparable from a ‘hylomorphic’ model implying both a form that organizes matter and a matter prepared for the form; it has been show that this schema derives less from technology or life than from a society divided into governors and governed, and later, intellectuals and manual laborers … It seems that nomad science is more immediately in tune with the connection between content and expression in themselves, each of these two terms encompassing both form and matter … [nomad science] *follows* the connections between singularities of matter and traits of expression, and lodges on the level of these connections, whether they be natural or forced (Deleuze and Guattari 1987: 369).

Royal science is formalized and established, and as such continues to articulate along the same lines again and again. Once chemistry received its theoretical elaboration through the concept of weight, and once Euclidean geometry articulated a theory of gravitational parallels, they both became forms of royal science (Deleuze and Guattari 1987: 370). Yet when a new element is introduced which shifts the theoretical grounding of such science, one finds a space for nomad science. Thus Deleuze calls nomad science, or smooth space, ‘the space of smallest deviation’ (Deleuze and Guattari 1987: 371); it does not overturn royal science, but neither does it work with it. It vectors off in another direction, not trying to discover the forms and axioms that royal science does, but to see where the singularity of their new direction leads. Ideally, both sciences can work in concert (inasmuch as that is possible, seeing that one cannot unify the two completely), for while nomad science can invent problems, it takes royal science to develop solutions via its theoretical apparatus (Deleuze and Guattari 1987: 374). Nomad science deviates from the functive science of *What is Philosophy?*, and is more open to changes than axiomatic science. As such, it can perhaps theorize contemporary scientific discoveries in a way functive science cannot; as DeLanda says, it is ‘the ‘more Deleuzian’ approach to the subject’ (DeLanda 2002: 223).

These two theories of science, the functive, axiomatic one and the nomadic one, are both vital to an encounter between Deleuze and contemporary evolutionary biology, as without both it is impossible to see how science can and should react both to the Deleuzian critique from the perspective of difference, and the recent discoveries of punctuated equilibium and genetic diversity. Before beginning that encounter, it is necessary to discuss Darwinian evolution and Deleuze’s response to it to provide the proper context for the developments in contemporary evolutionary biology.

Charles Darwin, with his book *The Origin of Species*, introduced the theory of evolution by natural selection, proposing a solution to one of biology’s most fundamental problems: how to account for the similarity and diversity observed in living things and life forms. Darwin’s observations suggest that individuals could be viewed as products of a sequence of certain biological events. Instead of categorizing living things by morphology, Darwin proposed a mechanism or process for how groups such as species came to be. Individuals’ characteristics depend on the characteristics of their ancestors.

By the theory of natural selection all living species have been connected with the parent-species of each genus, by differences not greater than we see between the natural and the domestic varieties of the species at the present day; and these parent-species, now generally extinct, have in their turn been similarly connected with more ancient forms; and so on backwards, always converging to the common ancestor of each great class (Darwin 1909: 335).

Knowing that there is a historical process underlying biological classification opens up the possibility that there might be more than one classification system. If the genealogies of living organisms converge in the past on a common ancestor, then at some point in the past the classes of things were different, and they will change in the future. Species once existed that have since become extinct or are present in different forms. The integration of fossils into evolutionary theory supports the thesis that natural selection can lead to extinction or to the survival of species. Darwin supports his theories of evolution by natural selection by revealing the similarities between extinct species and currently existing species, although many forms did not contribute to current groups (Darwin 1909: 370). The Aristotelian system may have been a useful tool, but it loses its utility as it fails to account for change. Life forms must be in a state of constant change if we are to make sense of the empirical evidence provided to us. ‘Scarcely any paleontological discovery is more striking than the fact that the forms of life change almost simultaneously throughout the world’ (Darwin 1909: 373). Change must involve the generation of variation in a manner both random and undirected, while another force – natural selection – weeds out that which is not adaptive.

Darwin develops his theory evolution by natural selection by focusing on differences among individuals as a driver of continuous change. Darwin claims differences among individuals (even within the same species) occur naturally – some people are just taller, thinner, faster, and so on, than others – and some of these differences help individuals survive and reproduce, passing the advantageous trait to their offspring. In order for the trait to be selected for, it must be heritable, as even the traits of the most healthy and fit organism in a population will not be selected for if the organism fails to reproduce. Individuals without a selected trait will have fewer offspring – or be less fit, in Darwinian language. Over many generations, assuming that the trait continues to provide an advantage in reproduction, that trait will become common in the species, possibly displacing individuals without it. Individuals without that trait may develop a different trait that is similarly advantageous, leading to a new deviation from the original line, or they may just decline in number as the individuals with the selected trait expand.

But if variations useful to any organic being ever do occur, assuredly individuals thus characterized will have the best chance of being preserved in the struggle for life; and from the strong principle of inheritance, these will tend to produce offspring similarly characterized. This principle of preservation, or the survival of the fittest, I have called Natural Selection (Darwin 1909: 141).

For Darwin, there is no archetype or intelligence that is shaping the development of species and the production of new and unique individuals, it is a natural force working independently of any telos. Yet because of natural selection, small differences – a slightly larger beak, thicker fur, and so on – can become, over time, differentiating qualities that distinguish one species from another, inevitably changing the previous classification system. Inheritance, variation, and natural selection are, together, the three core elements of evolutionary theory.

Deleuze references Darwin because individual differences are critical to the process of evolution. Instead of seeing difference only through the lens of representation, Darwin’s theory examines individual differences. Darwinian evolution is not motivated by movements towards similarity but by divergences of groups of organisms. Processes of individuation are highlighted rather than processes of unification.

The great taxonomic units – genera, families, orders, and classes – no longer provide a means of understanding difference by relating it to such apparent conditions as resemblances, identities, analogies, and determined oppositions. *On the contrary*, these taxonomic units are understood on the basis of such fundamental mechanisms of natural selection, as difference and the differenciation of difference (Deleuze 1994: 248).

In Darwin’s view, classification systems result from fundamental processes that lead to difference – processes like natural selection of individual heritable variation. Individual differences are transmitted from one generation to another and the most fit are likely to be passed on. Thus nature selects for those traits that enable organisms to adapt to environments and may lead to divergence of populations. Deleuze identifies three Copernican revolutions at work in Darwinism: the formation of individual differences via a divergence of traits and constitution of populations, the revelation of the links between differences through the coordination of traits within a population, and the production of differences as the ongoing basis of differenciation and connection (Deleuze 1994: 249). Darwinism, in other words, allows the thought of categories re-shapeable by processes of individuation and the idea that individuals have within themselves individuating differences (Deleuze 1994: 250). However, Darwinism fails in a crucial way for Deleuze, as it only references differences borne by individuals and not individual differences as such. Darwin still provides the notion of species with ontological stability by positing that the ‘fields of individuation’, as Simonden calls them, remain the same for all individuals within a certain species, that only once one goes outside the species can one find a different field of individuation.

However, this field of individuation is posited only formally and in general: it seems to be ‘the same’ for a given species, and to vary in intensity from one species to another. It seems, therefore, to depend upon the species and the determination of species, and to refer us once more to differences borne by the individual, not individual differences (Deleuze 1994: 252).

Darwin’s model is still constrained by similitude and generality; whatever differences exist between individuals are dependent upon what differences the category of species will allow for, and difference is not freed from blockages and regimes of representation. Differences within individuals are still referred to a larger field of similitude (that of species), and as a result Darwin is unable to see the individual as the production of differences (or the result of processes of individuation).

Deleuze discussion of evolution and Darwinism, both the positives and the negatives, extends beyond *Difference and Repetition* into his other work. In an essay written on Bergson, Deleuze states that biology shows the process of differentiation at work, and that life itself is the process of difference. Darwin helped associate the problem of difference with life in his theory of evolution even though he had a false conception of vital difference and conceived of it as something external rather than something internal. Bergson, according to Deleuze, fixes this problem by developing a concept of internal difference.

Life is the process of difference. In this instance, Bergson is thinking less of embryological differentiation than the differentiation of species, i.e. evolution. In his idea of evolution, Darwin helped associate the problem of difference with life, even though Darwin himself had a false conception of vital difference. Opposing a particular mechanism, Bergson shows that vital difference is an *internal* difference (Deleuze 2004: 39-40).

Deleuze’s book on Bergson discusses Deleuze’s positive view of evolution. Evolution, according to Deleuze, takes place from the virtual to the actual – it is a process of actualization and creation. As a result, when speaking of evolution it is important to avoid interpreting evolution either as the ‘possible’ being made actual or in terms of pure actuality. Evolutionism is not a sequence of actual determinations along a single line; to conceive of it as such is to eliminate chance – or vital life – from it, and to again subsume life under a concept. Deleuze argues that a philosophy of life should carry three requirements: first, it must conceive of vital difference as internal to itself, not external; second, differences must be seen not as entering into relationships of association and addition, but dissociation and division; and third, vital difference must be seen as involving a virtuality that is actualized according to lines of divergence (Deleuze 1988: 98-99). It is clear from these notes that Deleuze advocates reshaping evolution and biological classification systems by emphasizing internal difference and vital life over similitude and deterministic constructs.

The encounter in *A Thousand Plateaus* between the character Professor Challenger (representative of Deleuze’s philosophy) and traditional evolutionary theory illuminates an alternative to biological classification systems that embodies these three requirements. This alternative can be schematically described as a relationship of double articulation between the plane of consistency and the plane of organization that leaves open how differences are concretized in concepts, words, and substances – or, to use the vocabulary of *A Thousand Plateaus*, how strata are formed. In the first articulation, the articulation of content, particular molecular units are chosen from particle flows and given form through an ordering of them in terms of relationship and sequence – as Deleuze and Guattari put it, content is ‘formed matters’. The second articulation, the articulation of expression, provides mechanisms that shape such matters and produces composites with these matters – as Deleuze and Guattari put it, expression is ‘functional structures’ (Deleuze and Guattari 1987: 40-43). These two articulations, which exist in reciprocal presupposition, select from the differences, haecceities, and speeds of the plane of consistency before ordering, binding, and using them to produce entities, categories, and formations. The strata formed by double articulation are characterized as

giving form to matters, of imprisoning intensities or locking singularities into systems of resonance and redundancy, or producing upon the body of the earth molecules large and small and organizing them into molar aggregates. Strata are acts of capture, they are like ‘black holes’ or occlusions striving to seize whatever comes within their reach. They operate by coding and by territoriality (Deleuze and Guattari 1987: 40).

A strata works to subsume differences and intensities into its territorialization – to capture whatever happens to fall into its sway. To be clear, this process that forms and perpetuates a strata differs from the changes that entities undergo on a particular strata, as for each strata there is both an interior and an exterior milieu. The materials within a certain strata have already been concretized – are already articulated – and, while it is furnished by the intensities and differences beyond it, is part of the strata (just a different part from the formed objects) (Deleuze and Guattari 1987: 49). The value of this framework is that it rethinks biology and evolution through difference in order to avoid the pitfalls of representation. Species, organisms, and differences within individuals are traceable back to individual differences and divergent series rather categories of similitude. Moreover, by defining materiality outside of a mechanistic or deterministic framework,[[6]](#endnote-6) Deleuze accounts for the movements and changes evolutionary theory describes without binding life to a restrictive or static conception of it.

This new ontology reinterprets Darwinism by describing Darwin’s two contributions to a theory of difference as ‘the substitution of populations for types, and the substitution of rates or differential relations for degrees’ (Deleuze and Guattari 1987: 48). By focusing on populations, Darwin uncovers a mechanism for the formation of organisms within an environment that doesn’t posit forms as pre-established but sees individuals within species as open to a whole assemblage of possible forms. Darwin says,

The many slight differences which appear in the offspring from the same parents, or which it may be presumed have thus arisen, from being observed in the individuals of the same species inhabiting the same confined locality, may be called individual differences (Darwin 1909: 59).

Individual embryos themselves, according to Darwin, seem to follow some ‘higher organization’ (Darwin 1909: 483) which compels organisms to develop according to a previously sketched out structure; yet embryos themselves admit to a degree of variation between them, implying that there are no eternal necessary forms organisms fall into but that the cause of an individual’s development is at least in part determined by ‘conditions to which either parent, or their ancestors, have been exposed’ (Darwin 1909: 483). Second, as Darwinian natural selection of organisms always occurs within an environment, a particular organism’s ability to survive is not measured according to an absolute form of excellence, but in relation to other organisms and the environments it inhabits. The evolution of organisms is relative and contextual, not totalized. Nevertheless, traditional Darwinian evolution does not discuss the processes of individuation that Deleuze refers to in his work. It takes place within the strata of *A Thousand Plateaus*, or alternatively within the actual of *Difference and Repetition*, as evolution applies itself primarily to individuals and the differences that they allow; there is no discussion of the double articulation or actualization of the virtual Deleuze respectively discusses in these two works. Yet it does begin the process of breaking the individual down, and of opening spaces to see beyond concretized forms, as Darwin points to processes preceding the individual that are responsible for shaping it – namely, the ‘conditions’ inherited from ancestors. The Deleuze of *Difference and Repetition* is closer to Darwin than the Deleuze of later works, for Deleuze, like Darwin, begins his work there by examining the empirical individual before tracing back to the conditions necessary for its constitution. Deleuze posits the virtual and ‘larval selves’ in that work as a condition necessary for the possibility of individuals just as Darwin posits evolution by natural selection as a condition necessary for the possibility of differences within individuals. By contrast, *A Thousand Plateaus* does not even begin in the same place as Darwin, but sees it necessary to first construct the field of empiricism from which a Darwinian study of differences within individuals can function. The Darwinian project of *On the Origin of Species* and *The Descent of Man* is conditioned by the project of *A Thousand Plateaus.* Despite these differences, Darwinism begins the process of thinking difference by avoiding reference to categorical absolutes while contributing to the study of multiplicities through seeing organisms in terms of their variable traits. What must be avoided is reifying a representation of evolution, or modelling evolution solely through categorical frameworks that hide the ‘chaos’ Deleuze and Guattari reference in *What is Philosophy?*

A great deal of the literature written about the connections between Deleuze and Darwin focuses on the ways in which Deleuze tries to rescue evolution from mechanistic or reductive perspectives. To save inheritance from determinism, Deleuze warns against seeing the egg as an already elaborated place, or heredity as a known event, as to make that claim is to reduce or erase the becoming at the heart of natality. The event of a new being cannot be seen as already decided – in fact, it represents a place of decoding and deterritorialisation . Despite the knowledge scientists have gained regarding DNA and the workings of inheritance, it is impossible to know the nature of an individual when all that exists is a fertilized egg. Keith Ansell-Pearson writes

In both cases Deleuze’s aim is to show that the question of heredity is not simply one that is *given*, either by the species or by the continuity of the germ-plasm. Rather, heredity becomes transfigured, and is made vital, through the becoming of the new individual and through a ‘law of life’ that goes beyond laws of genealogy and filiation … Natality is always inseparable from processes of decoding and deterritorialisation (Ansell-Pearson 1999: 9).

Deleuze does not want to reduce inheritance or evolution to a geneticist account which claims that all major attributes of a person can be determined solely by examining that person’s genome. An element of chance is necessarily part of any becoming, and the introduction of something new into the world opens the door to reinterpreting sedimented ways of understanding the world.[[7]](#endnote-7) Evolution cannot be reduced to a ‘germ-plasm’ such as DNA, but neither can it be seen as applying only to species or organisms – holding either of these views restricts the flow of difference and makes evolution conform to a certain image. Evolution is a productive power, yet when it is *only* applied to species or *only* applied to extant organisms its ability to produce becomes limited and localized; Deleuze is interested in freeing evolution by privileging the dissolution of forms rather than containment within them (Ansell-Pearson 1999: 81). A proper conception of evolution sees it as a movement involving the production of individuals, and not as a progression from individual to individual nor as a movement from general to particular.

The moves Deleuze is making here are crucial to his insight into germinal life and to his attempts to articulate a philosophy that conceives of the evolution of organisms as complex systems in terms of a field of individuation and intensities (Ansell-Pearson 1999: 95).

Among the advantages of reinterpreting evolution is that this new perspective will free up the concept of life from an attachment to a mechanistic concept of evolution, one that sees life as only occurring within certain boundaries and fields.[[8]](#endnote-8) As Elizabeth Grosz points out, the concept of life is something that Deleuze returns to again and again, continually trying to elaborate a definition of it not bound by conventional notions of subjectivity or recognizable forms of what constitutes the living and non-living. Deleuze’s interest in pre-subjective forces and modes of living other than the human one reveal his desire to get beyond a concept of life circumscribed by common sense (Grosz 2007: 297). It escapes any restrictions put upon it by the deterministic or mechanical explanations of science, creating a more productive and organic concept.

**IV. Punctuated Equilibrium and Genetic Variation**

To see how Deleuze’s project applies to recent developments, this paper will focus on two specific developments in recent evolutionary biology that have important consequences for our understanding of the organization and evolution of organisms: the theory of punctuated equilibrium and recent measurements of the amount of variation within the human genome. Both will be discussed in terms of how they have modified the conceptualization of evolution before moving on to a discussion of how Deleuze would react to them. Punctuated equilibrium claims that evolution is not a gradual process that shifts one form to another. Instead, variation accumulates through periods of relative stasis, followed by radical shifts over relatively short periods of time. This process creates new forms before returning to periods of relative stasis for extended periods of time. The shift often occurs in a small and isolated segment of the population. Instead of seeing the slow evolution of a large group of organisms towards s new form, one sees a subsection of the group suddenly break off from the rest of the group and rapidly evolve into a different form. In the paper generally credited with providing the first comprehensive description of punctuated equilibrium, authors Stephen Gould and Niles Eldridge write,

In summary, we contrast the tenets and predictions of allopatric speciation with the corresponding statements of phyletic gradualism previously given: 1) New species arise by the splitting of lineages, 2) New species develop rapidly, 3) A small sub-population of the ancestral form gives rise to the new species, 4) The new species originates in a very small part of the ancestral species’ geographic extent – in an isolated are at the periphery of the range (Eldridge and Gould 1972: 96).

The picture of punctuated equilibrium keeps much of Darwin’s original theory in place – the idea that new species arise from variation inherent in previous species, the claim that the specific changes are selected via natural means, and the notion that changes are passed along generation to generation by reproduction – but changes how scientists see the origin of new species. For a long time after the acceptance of evolution as a theory, scientists had no explanation for gaps in fossil records where no evidence existed of an intermediary between two distinct species. Most assumed that a lack of data was the cause. Punctuated equilibrium explains the gaps and posits a new way in which new species could occur. No evidence exists because changes occur over a relatively short period of time (evolutionarily speaking), and new species develop because they originate in an isolated part of a population (where it is easier for a mutation to spread). Punctuated equilibrium also reinterprets the creative force in the formation of individual differences, seeing such creation as more of an explosion outward than a constant pressure in one direction. One often-quoted example of punctuated equilibrium, the Cambrian Explosion (the event 600 million years ago where the number of identifiable species increased rapidly over a short period of time, establishing most of the species currently recognized), is responsible for much of the diversity existing today. According to Gould, it seems as though this explosion was part of a naturally occurring phenomenon.

Perhaps the explosion itself was merely the predictable outcome of a process inexorably set in motion by an earlier Precambrian event. In such a case, we would not have to believe that early Cambrian times were ‘special’ in any way; the cause of the explosion would be sought in an earlier event that initiated the evolution of complex life … The pattern of the Cambrian explosion seems to follow a general law of growth. This law predicts a phase of steep acceleration; the explosion is no more fundamental (or in need of special explanation) than its antecedent period of slower growth or its subsequent leveling off (Gould 1978: 127).

Punctuated equilibrium, building on Darwin’s insights, posits a new process of evolution and explains the incredible diversity of life that Darwin’s theory cannot.

The second development in evolutionary biology is a relatively new one, having only recently been published, and its implications are yet to be completely understood. With the recent sequencing of the human genome, scientists such as Sarah Tishkoff, Esteban Parra, and Michael Bamshad have discovered an unexpected amount of genetic variation within human individuals and populations. The result of this achievement has led to a rethinking of the role variation plays within populations. Expectations of variation prior to the sequencing of the human genome were that if one were to take two individuals at random and compare their genomes, for the most part they would be the same, with differences appearing in one in every 600 or so base pairs; however, subsequent to the completion of the human genome it was discovered that on average a difference appears in one in every 60 base pairs. This appears to contradict traditional evolutionary theory, which claims that variation is eliminated by natural selection, which weeds out variations not as fit as other variations. Darwin explains this aspect of his theory in his discussion of extermination,

therefore if an area be inhabited by very many species, each or nearly each species will be represented by few individuals; and such species will be liable to extermination from accidental fluctuations in the nature of the seasons or in the number of their enemies. The process of extermination in such cases in such cases would be rapid, whereas the production of new species must always be slow. Imagine the extreme case of as many species as individuals in England, and the first severe winter or very dry summer would exterminate thousands on thousands of species (Darwin 1909: 140).

While nature inevitably and necessarily produces variation by the process of mutation, it also destroys it by the process of natural selection. This does not mean that individuals within a species will eventually become identical because mutation continually generates variation. There is a constant process of generating new variation and eliminating variation. Evolution by natural selection leads to certain traits becoming less important. Many believed that the amount of variation within the genome would be limited by natural selection. Yet a number of experiments mapping genetic variation across populations have revealed that groups once thought to be mostly genetically homogenous actually contain a remarkable amount of genetic variation. Over time, the genes and DNA sequences that code for particular traits have not disappeared but formed ‘dead’ genes littering the human genome (Coyne 2009: 67). For example, human populations within parts of East Africa, instead of containing fairly homogenous genotypes, actually possess one of the greatest amounts of variation among all the populations on the planet (Tishkoff et al. 2009: 1035-1044). The variation in human populations is mirrored by linguistics, culture, and history as well. A recent study examining the correlation between skin pigmentation and genetic diversity discovered that even people with similar skin colours have significant amounts of genetic variation between them – as the same skin colour may be caused by multiple different genetic configurations. As the authors put it, the trait of skin pigmentation is ‘… an example of how misleading simplistic interpretations of human variation can be …’ (Parra 2007: 101). The cause of this large amount of variation is not yet known, as this discovery is relatively new, but it has problematized how subgroups of humans are classified. While earlier discoveries regarding human genetic diversity have cast doubt upon race as a biological classification (Livingstone and Dobzhansky 1962: 279-281), the excessive amount of genetic diversity within populations calls into question categories such as population (Tishkoff and Kidd 2004: S26), ethnicity (Royal and Dunston 2004: S5), and geographic location (Bamshad et al 2004: 601). As one researcher puts it,

For hundreds of years, we have based inferences of individual ancestry on proxies, such as differences in physical appearance, language, or derivative concepts of ethnicity and race. None of these characteristics is determined entirely by genetic or environmental factors, but separating out the relative contribution of each will often require sorting individuals into ancestral groups ... (Bamshad et al 2004: 607-608).

The study of evolutionary biology and genetics does not support the categorization of organisms strictly by appearance, function, or other obvious categories. Instead, the processes constituting the individual – such as their genome derived from their ancestral lineages – need to be the locus from which classifications of any sort gain utility and efficacy. With the revelation of the amount of diversity within the human genome, it is possible to see the stability of species – and other representations – being undermined not only over a period of time as evolution selects for new traits but also from within the present moment as individuals, genes, and pre-subjective processes take on more ontological weight in the understanding of difference and variation within all organisms.

These developments are, of course, not representative of the entirety of evolutionary biology’s development post-Darwin, since like any field there are multiple voices directing its progress which are not always in agreement; however, they are relevant to this paper as they are illustrative of several ways variation and difference have been reinterpreted since Darwin’s time. But what would Deleuze think of such developments? Deleuze would welcome any casting off of a representation or image used to restrict the flow of difference, and both developments mentioned above can be interpreted as doing such, but it is possible that the developments just replace one representation for another. In regards to punctuated equilibrium, for example, the authors of the original paper advocate using the punctuated equilibrium model instead of the model of gradual evolution in most cases. If the punctuated equilibrium model were to replace the one of gradual evolution, then Deleuze would charge evolutionary biology with substituting one representation for another. While punctuated equilibrium has been shown to be a reasonable model in certain cases, scientists for the most part have avoided completely replacing gradualism with punctuated equilibrium, referring to individual cases and their relationships to one another to determine which model for evolutionary change is adequate. Both punctuated equilibrium and gradualism are being kept around as possible explanations, but neither is referred to as the only – or the most common – way in which evolution occurs (Coyne 2009: 4-5). Moreover, the theory of punctuated equilibrium – by referring to the production of difference in certain cases as an explosion – throws the light back upon the productive forces that create difference and variation in a way Deleuze would find positive. Yet punctuated equilibrium is not wholly Deleuzian, as it gives the concepts of species and evolution by natural selection the same epistemological cachet Darwin did. As punctuated equilibrium still functions under these concepts it fails to focus on processes of individuation and, according to Shostak, weakens natural selection as a scientific tool.

The problem is that lumping everything under the aegis of natural selection may yield something too attenuated to support a scientific hypothesis. Possibly natural selection could account for ‘equilibria,’ or stabilizing selection, but it could not, at the same time, account for ‘punctuations’ (Shostak 1999: 234).

Punctuated equilibrium loosens the restrictive representations that have characterized evolution, but does not fully open evolution to new possibilities and differences.

Next, the discovery regarding the amount of variation present in the human genome is partially consonant with Deleuzian ontology inasmuch as it problematizes certain categorizations of individuals and emphasizes individualizing elements and processes (such as those involved in the production of the human genome and historical factors like language). Categories like race, population, and ethnicity – which are unable to capture the extant individual but only approach him or her – are losing their ability to explain genetic variation while individuating processes within the human genome are becoming more useful and valuable to scientists studying this discovery. This discovery is not fully consonant as it makes no reference to the virtual, treating all the elements it discusses as actual. While certain categories and evolutionary models are destabilized, one is not returned to difference or chaos but to a different part of the strata. Mutation and variation receive a greater emphasis, but they do not achieve an overturning of representation. Despite the differences, these developments in evolutionary biology have led to an increasing focus on difference, variation, and heterogeneity, upsetting well-established views on evolution and variation.

It is uncertain whether degree science – as it is generally practiced – can be made to accord with Deleuzian ontology given the divergent projects of science and philosophy. The contrasting nature of *What is Philosophy?*’s functive model of science in comparison with *A Thousand Plateaus*’ major/minor science require a nuanced and multifaceted approach to this question. If we approach these developments with the functive model, it is unlikely that science can ever be fully reconciled with Deleuzian ontology, as both punctuated equilibrium and the discovery of greater variation are based off of studies and experiments carried out under rigid methodological considerations, which, for science, are crucial for determining validity. From a Deleuzian point of view, such considerations are interruptions that limit, slow, or constrain productive difference in order to produce truth in a certain way – as a result, their ability to properly conceptualize difference is circumscribed. Additionally, while the original criticism that Deleuze had of Darwin – that he considers differences within individuals, not individual difference – has lost some of its efficacy as more scientists focus on individualizing processes and avoid rigid categorical distinctions, it is not the case that scientists have abandoned their use or dismissed them as illusory and fictitious. For scientists, certain categories have proven salient through genetic research and, as a result, have an ontological reality that Deleuze would reject, claiming that their ontological reality appears only because of a certain image of thought that cannot be sustained when one moves to a philosophy of difference. A Deleuzian scientist – as much as there can be one within the functive model of *What is Philosophy?* – should place greater emphasis on processes of individuation, and allow their models for individuals and populations to remain open to new formations and organizations (Deleuze 1987: 70). Shostak’s alternative to evolution, devolution, is formulated along these lines.

Devolution is the descent (collapse) of qualities upon successors through assimilation into chimeras and parsing out into fragments. In its failure to ‘differentiate’ and ‘equate,’ devolution exchanges differences for sameness through exclusion and sameness for difference through repetition (Shostak 1999: 151).

For Deleuze and Shostak, the fluid and discontinuous should be emphasized over the rigid and articulated.

The major/minor science model of *A Thousand Plateaus* reveals a way of aligning scientific study with Deleuzian ontology in a way that *What is Philosophy?* does not, as its conceptualizing of the relationship between the hylomorphic, striated model of major, or royal, science and the smooth model of minor, nomadic science demonstrates how a science that embraces difference and a science of theories and formulas can interact. A key point that runs throughout *A Thousand Plateaus* is that while the conceptual structures, or striations, that dominate traditional ways of conceiving of being hide difference, they are not in themselves bad, but are ‘inevitable [phenomena] that [are] beneficial in many respects and unfortunate in many others’ (Deleuze 1987: 40) – conceptual structures have strategic and tactical values as points of reference but should not be misunderstood to fully articulate reality itself. As discussed above, minor science does not add to major science but vectors off from it, pursuing singularities and their connection to traits of expression. In these terms both the theory of punctuated equilibrium and the discovery of the amount of variation in the genome have elements of minor and major science. Each can be considered in part minor science inasmuch as both follow singularities not explainable through the dominant model of evolution (for punctuated equilibrium the singularity is the lack of fossil records, while the discovery of the variation in the genome is the singularity). Scientists exploring these discoveries work to realign evolutionary theory around the singularities, in the process deterritorializing and reterritorializing the field of evolutionary biology. As can be seen from the discovery of variation, following a singularity can have repercussions far beyond the field of biology itself, but also for philosophy, history, sociology, and elsewhere – as such, it doesn’t just deterritorialize but ‘constitutes and extends the territory itself’ (Deleuze 1987: 372). To the degree that these developments in evolutionary biology undo and shift the earlier model of evolution, they are analogous to the nomad science of *A Thousand Plateaus*, and as such are not incongruous with Deleuze’s ontology. Yet while these developments function apart from major science, much effort is made by the scientific establishment to reincorporate them into major science; that is, to fit them into the dominant conceptual framework as much as possible rather than embrace and extend their difference. Proponents of major science have trouble accepting these singularities as such, so in order to explain the singularities in a manner amenable to them the proponents try to reinscribe them into the manufacture of major science. That this is the case is apparent in the large portions of the papers announcing these discoveries devoted to connecting them to the strata demarcated by evolutionary biology. Deleuze and Guattari warn against doing this with minor science, as

the extent that ambulant procedures and processes are necessarily tied to a striated space – always formalized by royal science – which deprives them of their model’ is the extent to which nomad science involves itself in striations again and makes it ‘still possible to cut the flow into layers (Deleuze 1987: 372)

The studies of the punctuated equilibrium and genetic diversity, because of the endeavour made to develop them as concepts within major science, do not truly function as minor science, but at most as a quasi-minor science. They are connected with an apparatus that seeks their description within a formula, and as a result they are not seen as ‘inseparable from a sensible intuition of variation’ (Deleuze 1987: 369) as nomad science desires to be. While their opening to singularities and to a reinterpretation of theory pushes them towards nomad science, there is no principle of difference at work in their development – only a contingent appearance of difference. For science to include a nomadic approach along with its royal approach, and thus in line with ontology of *A Thousand Plateaus*, the study of these developments would need to be more open to following singularities and less interested in their being taken up by the strata of major science.

The manner in which biologists now approach understanding evolution and the categorization of individuals has more in common with Deleuze’s ontology than a classical Darwinian understanding of evolution, but contemporary scientific methodology and modelling techniques prevent evolutionary biology from being completely Deleuzian. A completely Deleuzian evolutionary biology may not even a possibility, as in order to clarify what they have already determined scientists have had to rely on increasingly complex technologies and scientific procedures (such as neuroimaging and PCR synthesis) which can only be developed and programmed by using a certain image of the human as a biological animal. Were scientists to try to let their ideas develop along more open and flexible lines, it is questionable whether they would be able to proceed along these increasingly complex lines. The development of modern evolutionary biology seems to require that scientists make use of certain representations before they move to the processes that constitute the individual, as it is only through a representation that some processes relevant to the study of evolutionary biology can be uncovered and observed. At most, were scientists to take the concept of nomad science seriously, science could develop with an eye on difference and singularity and with less of an institutionalized practice of reincorporating discoveries back into major science. Even Shostak, whose reinterpretation of evolution does make difference internal to scientific research, begins with a space where differences are already partially represented rather than with difference itself. Deleuze’s characterization of science in *What is Philosophy?* as slowing down the infinite chaos indicates that he was aware of the challenges involved in getting science to embrace difference.

**V. Conclusion**

In closing, it is worth taking note of what is at stake in this discussion of the relationships between evolutionary biology and Deleuzian ontology. Primarily, the encounter with between the two calls into question our conception of what the self is. Common means of identification – be it race, gender, geographic location, or otherwise – are problematized, as well as a unified understanding of ourselves. How we are able to relate ourselves to others is a question that needs to be studied because of the ideas put forth in this paper. Caught up in this sense of self are the fields of ethics and politics as well, both of which often make use of one’s sense of identity in developing theories and principles. Yet as neither Deleuze’s nor evolutionary biology’s discoveries entail the loss of the self, but rather the removal of its sense of unification, the space that needs to be theorized is not a radical departure from existent notions but a substantial modification and resituating of current knowledges. Old categories like race, ethnicity, and ancestry that have shown themselves to be without justification need to be discarded, and new categories based on an individual’s particular genesis – highlighting traits strongly influenced by genetic factors like physiology or the possibility that one will express a certain condition – need to be developed in line with the variety of information that has been uncovered about the nature of the self by science and philosophy.

It is likely that Deleuze would think positively of the above developments in evolutionary biology, seeing a substantial shift towards a philosophy of difference from where science was at in the time of Darwin. Since that time, science has identified a number of sites and mechanisms Darwin was unaware of – such as DNA and patterns of inheritance – that have called into question both common classification schemes and the ontological purity of the individual. The focus on studying difference and variation has increased while the biological models previously relied upon have been reevaluated time and time again. Still, the process of articulating biology through an understanding of difference – that is, a biology that has not institutionalized an investigative model dominated primarily by conceptual structures but has the tools to study flows and singularities as well – is not complete, as certain methodological and ontological assumptions about the nature of science and its relation to the individual remain which are still grounded in an a philosophy of similitude, and some recent technological advances seem conditional upon scientists not completely transferring to a Deleuzian ontology. Yet despite these apparent obstacles, it is possible that one day science will reach the point of a philosophy of difference, as science’s open-ended nature and willingness to question its assumptions are some of its greatest assets.

1. Notes

. Deleuze articulates this philosophy in several ways throughout his oeuvre. For the sake of consistency, this paper works primarily from the formulation it receives in *Difference and Repetition*. [↑](#endnote-ref-1)
2. . See (Žižek 2012: 19-20) and (Badiou 2000: 69). Žižek claims there are 2 versions of Deleuze’s philosophy, and that only the first version frames ontology in this way. [↑](#endnote-ref-2)
3. . Manuel DeLanda opposes this interpretation, saying that there is no major break between early and late Deleuzian ontology, but rather that the terminological distinctions and conceptual differences between works ‘are slightly displaced relative to one another but retain enough overlaps that they can be meshed together as a heterogenous assemblage’ (DeLanda 2002: 202). This reading of Deleuze’s work ignores the importance of contemplation Deleuze gives in *Difference and Repetition* to the constitution of the self, such as when he says ‘There is a self wherever furtive contemplation has been established, whenever a contracting machine capable of drawing together a difference from repetition functions somewhere’ (Deleuze 1994: 78-9). There is no corollary to such contemplation in the equivalent concept that DeLanda identifies in *A Thousand Plateaus*; rather, such constitutions occur apart from subjective contemplation, as constitutions of intensities that occur within materiality (Deleuze and Guattari 1987: 329). [↑](#endnote-ref-3)
4. . Historically, it is worth noting that Darwin did not have a concrete definition of species in his published works, and in fact commented on the problems of defining the term on several occasions (including in *On the Origin of Species* and *The Descent of Man*). His working definition for species was ‘a classificatory term provisionally given to a group for the purposes of convenience and which emphasizes resemblance, but which does not differ substantially from variation’ (Darwin 1909: 68). [↑](#endnote-ref-4)
5. . It may even me more accurate to say that science, or at the very least a scientific orientation, is part of what constitutes the entities in the world. This would make *Difference and Repetition* more akin to the later Deleuze, but it is debatable whether or not the system of *Difference and Repetition* can sustain that interpretation. [↑](#endnote-ref-5)
6. . Material, for Deleuze, has three fundamental characteristics: it is molecularized, it has a relation to forces to be harnessed, and it is defined by the operations of consistency applied to it (Deleuze and Guattari 1987: 345). There is no such thing as base substantiality, as material for Deleuze has relations, trajectories, and speeds. It thus cannot be defined according to perfunctory, automatic rules. [↑](#endnote-ref-6)
7. . Importantly, Deleuze is joined in this view by numerous evolutionary biologists who also see knowledge of DNA and the genome being used to apply determination inappropriately, leading to reductionism. For a good example, of this view, see Lewontin 1991. [↑](#endnote-ref-7)
8. . Several scientific discoveries support this critique of mechanistic conceptions of life. Francis Jacobs’ *The Logic of Life* describes the irreducible role of difference and disparity in transcriptions of genetic codes vital to the functioning of evolution (Jacobs 1974: 290-292), while Shostak describes research that shows the possibility of conceiving of life as plural and open rather than singular and determined (Shostak 1999: 151). [↑](#endnote-ref-8)