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The New Creatures of Difference: A Look at the Concept of Repetition Within Dissipative Systems Theory

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Repetition is a major theme in contemporary thought, aligned more with difference and monstrosity than similarity and banality. This paper examines the logic of repetition through its deployment as a critique of the Western philosophical tradition's understanding of time as temporal succession and examines the development of new concepts of repetition in dissipative systems theory and evolutionary thinking.

I. Introduction

Repetition is undoubtedly a major theme in contemporary thought. It is both mysterious and common, both overwhelming and banal. Repetition produces monsters and boredom and much else besides. It is excessive and yet simple. Repetition can always be found, in action, at a border between the sayable and the unsayable, the visible and the invisible, the audible and the inaudible, the past, present, and future. What does the term mean? It tells us little about itself etymologically, standing for acts of saying or doing again.¹ Yet repetition describes a world that is not only discrete, but one of creative process and production; at the most general level, repetition underlies processes of becoming, inscription, taking place, and formation. For many thinkers, repetition is a key concept of the 20th century and yet for some, repetition, at least in its application, is less impressive. Kyle Gann views repetition as “perhaps the most stereotypical aspect of minimalist music...” (300). Robert Fink links it with the drudgery of consumerist culture and practice (x-xi). Yet there is undeniably a power proper to repetition that takes any sterility and transforms it into something seductive, mysterious, or even life-threatening. For instance, Gregory Bateson identified the problem of repetition as a key element in alcoholic addiction and recovery.² For Bateson, the repetition of successive *transformations of difference*, in circuits of creative, systemic linkages, define any alcoholic ‘self,’ in fact, any self or better, any creature. For Bateson, the self is not captured in the Western philosophical tradition because this tradition recognises the self in a capacity to repeat some originary identity. Here, alcoholism is mistakenly viewed as the problem of an originary identity that cannot escape from its addiction. But for Bateson, the self is no originary identity, the basic presupposition of the Western philosophical tradition is founded upon an error; the self is a creature of a different sort.

The present essay begins from an insight of Bateson's about such creatures of difference. Bateson reported that in June of 1977 he had begun writing two books: *The Evolutionary Idea* and *Every Schoolboy Knows (Mind and Nature, 3-4)*. The latter was to be a sort of layman's primer for the more difficult conceptual material of the former, an attempt to examine theories of biological evolution through systems theory, cybernetics, and information theory. Bateson wrote of the former:

It seemed to me that in ‘*Schoolboy*,’ I was laying down very elementary ideas about epistemology..., that is, about *how we can know anything*. In the pronoun we, I of course included the starfish and the redwood forest, the segmenting egg, and the Senate of the United States. And in the anything which these creatures variously know, I included “how to grow into five-way symmetry, “how to survive a forest fire,” “how to grow and still stay the same shape,”...and so on. Marvelous creatures with almost miraculous knowledges and skills. (*Mind and Nature*, 4)

Drawing together many of the same elements as Bateson’s inquiries into marvelous creatures, this essay also draws from inquiries in epistemology, systems theory, and evolutionary biology to examine repetition as a creature of difference. Here, repetition recasts traditional concepts of difference, identity, and change. Thus it should be no surprise that the work of Gilles Deleuze is a key reference. French philosopher Gilles Deleuze had perhaps gone furthest in endowing the problem of repetition with a measure of the impact it deserves to be credited with in contemporary thought. His *Difference and Repetition* offers one of the most sustained meditations on the concept of repetition in the history of Western philosophy, including in its relation to this tradition’s concepts of difference and identity. Moreover, 20th century reflections on repetition in every intellectual domain are rife with references to Deleuze’s master-work on the subject.

Deleuze identifies not one, but two forms of repetition. Firstly, the common association: repetition looks like a mechanical replication of the past moment or previous figure. Secondly, there is a clothed, disguised, or secret repetition, a creature of difference. For Deleuze:

The first repetition is repetition of the Same, explicable by the identity of the concept or representation; the second repetition comprehends difference, and comprehends itself as the alterity of the Idea.... The first is negation, in the absence of the concept, the second, affirmation, due to its excess over the Idea...the first is committed to equality, commensurability, symmetry, the second is founded on inequality, incommensurability, dissymmetry. The first is material, the second spiritual.... The first is inanimate, the second the secret of our deaths and lives, our slaveries and liberations, the demonic and the divine. The first is ‘naked’ repetition, the other a clothed repetition, which comes into being in clothing itself, in masking and disguise. (36-37)

When we view repetition as repetition of the same, as a discretely added ‘next’ in a series of what is, at root, the same phenomena (some x across different moments of time or space), we do not see what drives repetition as a process. For Deleuze, we are compelled to this view of repetition, an act of addition of things to like things, from one to the next, precisely because we rely upon the traditional conceptual tools of the Western philosophical tradition of representation. The Western philosophical tradition of representation takes presence-to-self (as in a consciousness that is a self precisely because it can find itself again and again in an act of re-cognition) or identity ($A = A$ and the logical laws deriving from this first principle) to be the basis for conceiving whatever phenomena under consideration. With the traditional tools, repetition must be conceived either as the same (a repeated

x) or as the opposite or elimination of alterity or difference (if repetition is just to be *another x*, then under no circumstance can any repetition be too dissimilar from the x it repeats; thus, repetition in the traditional sense can also capture the idea of a phenomena which *is not not-x*). But for Deleuze, repetition is precisely a differentiating process, one whereby such discrete repetitions of the same can become objects of our empirical perception in the first place. Repetition, in its secret and clothed form, in its masks and disguises, *covers itself up in the process of creating*. This is because while in routine, empirical perception we recognise repetition in its bare and mechanical form, there would be no element to re-cognise if repetition in its secret and creative form was not creating the differences our perception eventually latches on to and synthesises in its acts of (re-)presentation. Thus, repetition is fundamentally creative, not (re-)duplicative. If repetition can be duplicated and represented, it is because it is, foremost, creative.

In what follows I will outline the logic that unlocks the paradox of these statements. First, taking a nod from Deleuze, but relying more heavily on the work of Jacques Derrida—another major philosopher who positioned concepts of difference and repetition at the core of his thinking—I will describe the philosophical logic of temporal repetition upon which traditional understandings of repetition have run aground. Next, connecting philosophical reflection to Bateson's tradition of systems theory, I will describe a dissipative, thermodynamic systems view⁴ of repetition that explains how disequilibrium dynamics are used to generate creativity through the repetition of systemic cycles and processes of structural maintenance and construction. By disequilibrium, I refer to a thermodynamic precondition which must be in place for any phenomena to come into being. Put briefly, the Western philosophical tradition's concepts of self-presence and identity are concepts that take equilibrium to be the basic property of a phenomena (a phenomena only is if it is in a state of relative equilibrium with itself, that is, if a phenomena is in a state of disequilibrium with itself, whether through breakdown, decay, or becoming-other, then it cannot be or be recognized as such). Under Deleuze's view, though, since repetition is precisely a differentiating process, conditions of disequilibrium must be used to define it. Here, processes of disequilibrium, processes of becoming-other, dissolution, decay—creative, monstrous, and creaturely processes indeed—do a much better job of indicating what is basic to repetition. Lastly, I will link the systems view of repetition with evolutionary, biological thinking. Since the domain of evolution is clearly a creative domain of creaturely life, it will aid the general aims of this essay to describe the ways in which a seemingly redundant process like repetition is better appreciated as a creature of difference.

II. The Logic of Repetition

As Derrida points out, the logic of repetition is already at work in the early classics of the Western philosophical tradition, notably, in Aristotle's writings on the logic of temporal succession. Derrida's reading of Aristotle demonstrates how the attempt to understand time as a temporal succession of moments (a discrete series of nows following one upon the other as in the seconds marked by a clock ticking away, 12:00:01, 12:00:02, etc.) demonstrates the difficulty of conceiving time as a bare, simple, or mechanical repetition.⁵ Derrida's deconstructive logic begins from the point

of view that being is an impossibility, at least as first and indivisible, originary moment or substance. The Derridian premise of this point is the following: it is impossible to be, as originary moment or substance, because just what it is to be is to become other. Thus, any originary condition is already a becoming other (and in fact, a repetition of this process of becoming other). This logic is specified elegantly in Martin Hägglund's reading of Derrida's gloss on Aristotle's notion of temporal succession in his fourth book of the *Physics*, where, according to Hägglund, "[t]he temporal," construed as first or originary moment, "can never be in itself, but is always disjoined between being no longer and being not yet" (42). As Hägglund has it:

Aristotle here points out that there would be no time if there were only one single now [218b]. Rather, there must be at least two nows—"an earlier one before and a later one after" [219a]—in order for there to be time.' Time is thus defined as succession, where each now is always superseded by another now. In thinking succession, however, Aristotle realizes that it contradicts his concept of identity as presence in itself. A self-present, indivisible now could never even begin to give way to another now, since what is indivisible cannot be altered. This observation leads Aristotle to an impasse, since his logic of identity cannot account for the succession that constitutes time. (42)

Of course it is not difficult to notice that the order of the temporal succession described in the quotation is a repetition of discrete, isolatable moments, repetition in the naked and mechanical sense. The conditions upon which this kind of mechanical series of repeated moments rest, though, include: 1) a notion of discrete, fixed or unalterable identity for any (temporal) moment/s; 2) a separation or distinguishing of moments (here undertaken by the failed attempt to think time as such a series); 3) such that the phenomena under consideration (here, time) can be counted or registered as that which may mark change. Moreover, if a thinking human subject is not required for 2, then some other mechanism or process must nonetheless complete the separation. For, repetition presupposes some type of separation, just to be what it is, even if this separation is *not* a succession (although again, even the act of thinking repetition demands a logic not encompassed by the mechanical repetition of the same).

Indeed, following Derrida and Hägglund's reading of him, the temporal logic used to criticize notions of presence and unalterable identity requires more than a logic of succession. Derrida wrote:

Let us consider the sequence of nows. The preceding now, it is said, must be destroyed by the following now. But, Aristotle then points out, it cannot be destroyed "in itself" (en heautōi), that is, at the moment when it is (now, in act). No more can it be destroyed in an other now (en allōi): for then it would not be destroyed as now, itself; and, as a now which has been, it is . . . inaccessible to the action of the following now. (57)

On such Aristotelian assumptions time cannot be thought through succession or a bare and mechanical repetition. So, too, the presuppositions of a metaphysics that places identity first must be given up if one wants to think succession or repetition, even in the simple sense. Hägglund notes, “[t]he now cannot first be present in itself and then be affected by its own disappearance, since this would require that the now began to pass away after it had ceased to be. Rather, the now must disappear in its very event” (42). Hägglund continues:

The “past” cannot refer to what has been present, since any past was itself divided from its beginning. Likewise the “future” cannot refer to what will be present, but designates a relentless displacement inherent in everything that happens. Any so-called presence is divided in its very event, and not only in relation to what precedes or succeeds it...Or more exactly: time itself is the impossibility of any “itself.” This is not a paradox but follows from analyzing the minimal definition of time. Even the slightest temporal moment must be divided in its becoming: separating before from after, past from future. Without the interval there would be no time, only a presence forever remaining the same. (42-43)

What is the temporal logic that might grasp the passage of the now in its very appearance? The answer to this question involves presuppositions of a process-driven, creative repetition (Deleuze’s clothed and secret form). Such presuppositions allow succession itself to be thought; and as we will see further on, such presuppositions are preconditions for any empirical concepts, concepts which find a basis in human perception, to be thought.

A process-driven, creative repetition requires a temporal logic wherein any moment always already carries its fading-away within itself. Through this condition, namely, one in which an asymmetry or disequilibrium exists at the core of any repetition, there is created 1) the possibility of a lived experience of time, or duration, that carries the additional quality of 2) constituting the substantial basis of entities or objects, including temporal moments. While these qualities of repetition are rarely recognised because this logic of repetition is not a part of the dominant representationalism and presence-privileging of the Western philosophical tradition, they *synthesise or generate the differences* (the separable moments in succession, say) that make acts of recognition possible. Despite differences between these thinkers,⁶ the projects of Derrida and Deleuze are notably akin in that they attempt a conception of these hidden, clothed, synthetic or generative repetitions of difference. What these thinkers argue is that repetition is repetition of difference, namely, spatio-temporal differences in disequilibrium (disequilibrium conditions, as I explain below) that must be in place for any entities, or experiences of those entities, to be made possible. Such repetitions of spatial and temporal difference are creative and underlie acts of representation.

The essential consideration for grasping the temporal logic of repetition, then, is that it cannot be represented in its clothed, creative dimension using conventional conceptual analysis because repetition describes a logic of (creative) difference while the Western tradition of representation has taken presence-to-self or identity ($A = A$ and the logical laws deriving from this first principle) to be

the basis for conceiving whatever phenomena under consideration. For instance, within the domain of temporality, representational logic tells us that events follow one upon the other in succession, cause precedes effect. While this logic structures causal and narrative sequences which presuppose mechanical succession in their simpler forms (in Aristotelian efficient causation or conventional plot), it belies efforts to capture the temporality of repetition. When repetition is viewed as, first, that which is already differing from itself, even at the origin, a new logic is required.

In Deleuze's account of repetition, for example, time is grounded in repetition of difference such that the chronological sequence of any two events must be inverted in order to grasp the repetition that makes a simple succession first possible. The same holds, on Deleuze's view, for all empirical concepts that are subject to our perception. While representational logic holds that there must be a first in the order of succession (the original), a world of creativity and process dictates that there can be no first moment; for, any first must already be *within* temporal process, in disequilibrium with respect to any eventual identity that might be constituted and recognized. Here, the represented "original" is already a repeated moment, an effect, in the order of succession. While Western philosophical logic cannot conceive of difference without reliance on the notion of the first or original moment, substance, or cause, it must be admitted that the second in the order of succession must be considered primary (or first), because it extracts the original from disequilibrium conditions, forming a series which constitutes the "original" and which may be used to recognise it empirically in our perception. If something can be counted as "first," it must mark a difference from the conditions of spatio-temporal disequilibrium that would be required to constitute it, but repetition more accurately names the (masked) difference—the disequilibrium conditions—that must be in place to create anything at all.

III. Dissipative System Dynamics of Repetition

When it comes to considering the conditions of creation it is important to ask the following: the creation of what? Thus far I have considered the creation of phenomena and the spatio-temporal, disequilibrium conditions of difference that underlie and make possible any phenomena in empirical perception. We should be careful, though, to note that repetition is not solely a philosophical phenomena; it is a general one. While questions of perception are of especial interest to the history of philosophy, repetition must be viewed as a general phenomenon. Recalling Bateson, repetition occurs in all variety of creatures, but not just in animal or even plant life. Repetition is a *systemic* phenomena and characterizes certain aspects of any system. Specifically, repetition refers to the maintenance and construction of any difference(s) creatively generated and employed by a system to reproduce itself over time. In conceiving of repetition as a systemic and general phenomena, then, I will rely on a unified, systems-theoretical framework proper to all phenomena as well as to our understanding of them: dissipative systems theory. A systemic basis in the dynamics of entropy dissipation supports all phenomena, from the earliest phenomena in the universe, creatures existing well prior to any human act of representation, to the most banal or monstrous creatures of the present moment.⁷

Additionally, dissipative systems theory provides a convenient link to the philosophical reflections in these pages. Dissipative systems theory is a prominent intellectual tradition that has developed the *conceptual* tools to grasp the thermodynamics of disequilibrium and the ways in which conditions of disequilibrium are fundamentally creative. (See Harvey) Outlining dissipative systems theory, then, can help in conceiving repetition, construed on the terms of difference. For, just as philosophers like Derrida and Deleuze have provided powerful criticisms of the Western philosophical tradition's usage of presuppositions that take equilibrium conditions to be basic in philosophical explanation (as in the attempt to ground temporal succession or origin in the presence-to-self or identity of a first moment), dissipative systems theorists have eschewed equilibrium presuppositions when understanding the thermodynamics of a general systems view capable of explaining all phenomena, whether in philosophy, science, art, etc. (See Prigogine and Stengers).

Returning briefly to Deleuze, a thinker well-versed in dissipative system concepts, let us take a look at the following quotation:

(Artists) do not juxtapose instances of the figure, but rather each time combine an element of one instance with another element of a following instance. They introduce a disequilibrium into the dynamic process of construction, an instability, dissymmetry or gap of some kind which disappears only in the overall effect. (22)

The notion of systemic disequilibrium is a key concept in dissipative systems theory and can be likened to an act of artistic construction. After all, systems are precisely constructions: they are sets or series of elements in grouped relations, while the grouping of these elements in relation is based on the ways in which they maintain themselves, historically, over against perturbations from their environments. Indeed, this is the definition of function. A system's function is prescribed by the way in which it has historically maintained the relations through which its elements are grouped. In dissipative systems theory, all systems must repeat their structure in the face of the following requirement: all systems, in order to be at all, must 1) dissipate or funnel entropy into their environmental surroundings and 2) take up new flows or inputs of the energy, matter, and information through which they are constructed. Entropy dissipation and negentropy production name a basic, systemic cycle, a core repetition underlying the processes driving any phenomena and its possible recognition. Entropy names the tendency to decay as prescribed in the second law of thermodynamics which specifies that, ultimately, systems return to states of equilibrium in relation to their environments. Equilibrium reflects a stasis in systems or between a system and its environment in which because there is no flow of matter, energy, and information into or out of a system, the system decays; it does not repeat itself. Such a condition of stasis is not unlike the Western philosophical requirement for representation on the laws of self-presence and identity.

Conversely, negentropy refers to a system's overcoming the tendency to decay. Negentropy is a particular feature of living systems and proceeds largely through the establishment of auto-catalytic cycles (or repetitions), such as we find in our bodily metabolism. Negentropy is fundamentally a repetition of structure, even if, again, this does not imply stasis and identity duplication, but creative

maintenance of disequilibrium conditions. Living systems exist in disequilibrium conditions precisely by repeating structure over against tendencies to decay.⁸ Furthermore, entropy arises both within and without systems. For example, our bodies must constantly repeat their structure by taking in energy, matter, and information from the external environment in order to avoid loss of structure, ultimately death (this process is also captured in the idea of negentropy); similarly, if our bodies were not fed, they would break down internally. Of course, systems not only maintain their structure, as if it pre-existed, but constitute or construct this structure through continual or repeated processes of dissipating their entropy back out into the environment (a constant exchange of energy, matter, and information with an external environment is required). Thus, on systems terms, repetition refers to two distinct processes: one, the maintenance of structure through repetition (of structure) and two, the construction or creation of structure. Both occur against a background of entropy that can only be dissipated in disequilibrium conditions. If a system were not in disequilibrium conditions, it would close itself off entirely to the very sources of its creative repetitions of maintenance and construction of structure. This last is the key insight where conceiving repetition as difference and disequilibrium is concerned. Disequilibrium is the necessary precondition for any system capable of maintenance and construction of structure over against entropy. If a system was in some kind of equilibrium with itself (e.g., in the philosophically unsound notion of being in identity with itself at its origin) it would not be able to maintain or create structure; it could not be, at all.

Thus, the notion that any temporal moment contains a disequilibrium at its core is a consequence of the fact that any phenomena is first constructed as a structure that arises by repeating itself in the context of systemic, disequilibrium conditions. Philosophically speaking, then, the spatio-temporal differences that occur at the boundary between systems and their environments (including the other systems in their environments) define the disequilibrium, instability, asymmetry, etcetera, at the core of creative repetitions (of maintenance and of construction) of structure. Furthermore, it is not as if structure becomes the new originary or first term, rather, structure precisely *is the result of* disequilibrium at the origin while repetition is the continuous generation of structure. Placing these insights in the context of evolutionary and biological thinking will help to clarify them more concretely. Imagine the embryo of an animal. The embryo is a structure that repeats itself through creative constructions of spatio-temporal differences (for example, in the resolution of molecular concentration gradients which play a role in tissue formation and the building of the body of the organism) and yet the embryo itself exists in a disequilibrium state with respect to its environment. This disequilibrium is a condition of the structure it, in turn, generates. Similarly, the embryo first emerges from its own set of disequilibrium conditions in its environment.

IV. Repetition and Evolution

As a general, systemic phenomena, repetition also characterises the life-process of organisms historically, in their evolution. One can see this by examining the work of Darwin, for example. For Darwin, all organisms are created by mechanisms which are fundamentally repetitions, for instance, natural selection (were processes of selection to cease, so too would evolution), phenotypic variation

(nature never produces an identical copy, but repeats variations on the organism), and heredity (the continual passing off of traits between generations). Henceforth, within the Darwinian framework of evolution, all organisms become results of a logic of repetition that gives pride of place to its creative and differential form. Commenting on this insight, philosopher and ‘Larval Subjects’ blogger, Levi Bryant—one of the few philosophers to comment on the relation between Deleuze’s view of repetition and the principles of Darwinian, evolutionary biology⁹—offers an essential remark as part of a larger meditation on Darwin, Deleuze, and posthumanism. He writes:

Difference is creative, not deviant. In the old Platonic-Aristotelean-Thomist model of nature, difference was seen as a deviation from form or essence. Organisms were measured or evaluated in terms of how closely they approximated an ideal form of what organisms are supposed to be. Thus, for example, a human that had the body of Brad Pitt coupled with the reason/intellect of Einstein would be considered more genuine and real than a human that had the body of Socrates and the intellect of Forrest Gump. Differences that did not approximate the essential features of the form were seen as deviations falling out of “true being” and even as potential monstrosities... With Darwin all this changes. Far from being a *deviation* from “nature”, difference is now the motor, the engine, by which nature creates. (Bryant)

If differences were not generated again and again, there would be no material for Darwinian processes of evolution to work upon. The processes that drive Darwin’s particular formulation of evolution—variation, selection, and heritability—all entail repetition of various elements of the living organism. With variation, repetition must be differential: it is not as if deviant forms are produced, but, following upon insights gathered from dissipative systems (and in this case living systems), the repetition of new organisms (and their genetic material) derives from disequilibrium conditions and so, produces variation set at disequilibrium. No identical copy of an organism (or its DNA, for instance) can be generated because the disequilibrium conditions for generation must be maintained. A return to equilibrium in the generation of organisms would, as mentioned above, bring about an entropy capable of putting an end to the evolutionary process. The same holds for processes of selection and heritability. Additionally, variation for Darwin was random, but this referred to processes of repetition whereby slight differences were produced and, if selected, taken up in heredity and preserved. As Bryant pointed out in a continuation of the passage quoted above, random does not mean that Darwinian difference was without basis.¹⁰ Rather, precise mechanisms or better, creative repetitions of structure carried organisms down various lines of evolutionary descent. Did Darwin himself possess this more contemporary view of repetition as creative difference?

Of course Darwin himself had no understanding of Mendelian (or post-Mendelian) genetics, of DNA, molecular biology or even of any modern version of dissipative system dynamics and the disequilibrium conditions driving those dynamics. Stated otherwise, he had little understanding of many of the creative repetitions of structure outlined above. Still, the “modern evolutionary synthesis,” or “neo-Darwinian synthesis” of the 20th century is well-known for its attempt to resurrect

the Darwinian theoretical paradigm, with its core theory of natural selection, by updating it alongside insights gathered from the science of genetics and the application of statistical methods to this science.¹¹ Still, the neo-Darwinian framework of evolution was scrutinised by molecular and systems-minded biologists for that within it which lent itself to a more conservative reading of repetition and for its attachment to the random and unstructured accumulationist version of evolutionary change as a series of accidents capitalized upon through more or less heroic efforts of individual adaptation;¹² essentially, for its underestimation of the roles that systemically structured repetitions play in evolution. Many systems biologists—those whose starting point for understanding evolution was no longer the organism as individual, adapting slowly to environmental pressures from without, but who began to locate the riddle of evolution in more complex relations of environment and history—heavily criticized the neo-Darwinians precisely for their desire to preserve a synthetic theory of evolution based on the centrality of the individual, conceived in equilibrium with itself. A fairly representative statement of what is at stake in this criticism has been expressed by David J. Depew and Bruce H. Weber. They state:

The fact that nonequilibrium thermodynamical principles have not hitherto been invoked as an appropriate backing for an expanded synthesis is due in large measure... to a historically contingent preference of the Darwinian tradition for background assumptions deriving from models of system dynamics in which impinging ‘forces’ disturb an assumed equilibrium in order to account for change. (460)

Levi Bryant has stated that Darwin should be credited with the view “that matter is capable of generating pattern, or self-organising [because of its roots in disequilibrium], or maintaining pattern across time...At the core of Darwin’s thought is the thesis that matter has the capacity to self-organise, to form pattern, to generate life” (Bryant). Still, certain assumptions of the classical Darwinian framework do appear to favor a more traditional view of the individual, despite Darwin’s deeper insights into the creative and differentiating role of repetition.

The philosophical challenge to be posed to the more conservative adherents to classical Darwinism seem to be the following: does Darwinism require individuals to be conceived on the model of identity? Can the core of Darwinism withstand its conforming to a model of difference that requires a conception of the repetition of structure in dissipative conditions of disequilibrium? What happens to the study of evolution when what evolves becomes a creature of difference rather than an individual? As Depew and Weber would no doubt confirm, repetition, conceived in light of disequilibrium thermodynamic principles, is a prominent and valuable concept in evolutionary thinking and, if conceived on the presuppositions of contemporary systems thought, may offer a unified perspective on a range of intellectual, scientific and artistic, domains. Dissipative systems theory, which views repetition—all phenomena—as results of disequilibrium, dissipative system dynamics, may serve this unifying function. In any case, a concept of repetition as creative difference placed within a dissipative systems view provides fascinating alternatives to more traditional

assumptions in contemporary thought and indeed, seems to be where more monstrous conceptions of repetition and the new creatures of difference are heading.

Notes

¹ The word gains prominence in the 1520s where it is identified with the “act of saying over again,” from L. repetitionem (nom. repetitio), from pp. stem of repeterere “do or say again.” Accusative singular of repetitio.

² Bateson views alcoholism, and any possible recovery from it, as part of successive transformations of difference being repeated through various systemic circuits of immanent relational wholes.

³ By thermodynamic systems view, I refer to the science of thermodynamics which studies relationships of the conversion of heat and other forms of energy (including more complex forms of matter and information) that occur in or between systems, or between system(s) and their environment.

⁴ This section of the essay owes a great debt to Martin Hägglund, whose greatest contribution to the scholarship on Derrida lies perhaps in his clarification of the logic of temporality. Without Hägglund’s work on this issue, I would not have seen Derrida’s work in the lights described above.

⁵ See the book *Between Deleuze and Derrida* (2003), which does a good job of summarizing the differences and similarities between these thinkers.

⁶ See Ervin Laszlo whose book, *Evolution: The General Theory* (1996), remains one of the best general guides to the theory of dissipative systems theory as a general theory of evolutionary change. It also contains an excellent introduction to the basic concepts of dissipative systems theory.

⁷ This insight is captured wonderfully in the autopoietic systems theory of Humberto Maturana and Francisco Varela. See their *Autopoiesis and Cognition: The Realization of the Living* (1980) and *The Tree of Knowledge: The Biological Roots of Human Understanding* (1992).

⁸ Bryant encapsulates the relation nicely on the following terms: “[w]ith Darwin difference becomes the essence of nature. In Deleuze’s words, repetition is always repetition with a difference.” See Bryant, <http://larvalsubjects.wordpress.com/2012/04/02/eight-darwinianposthumanist-theses/>.

⁹ Bryant notes, “It’s not simply that there are random variations in nature, it’s that all replication (reproduction/copying) produces slight differences from the previous entity from which it is copied. In the Darwinian universe there are no perfect copies, only simulacra that deviate, ever so slightly, from the entity from which they were copied. In the old theological Nature, difference was seen as an abomination contaminating the purity of essence, form, the identical, and the same. With Darwin difference becomes the essence of nature. In Deleuze’s words, repetition is always repetition with a

difference.” See Bryant, <http://larvalsubjects.wordpress.com/2012/04/02/eight-darwinianposthumanist-theses/>.

¹⁰ One thinks of the seminal contributions of scientists like Ronald A. Fisher, J.B.S. Haldane, and Sewall Wright to the new evolutionary synthesis.

¹¹ This challenge to the new evolutionary synthesis goes back to the 1940s, 50s and 60s, but probably becomes programmatically articulated in the early 70s. See the excellent overview of this history in the introductory chapter to David J. Depew and Bruce H. Weber’s “Darwinism Evolving” (1995).

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