Conceptual Trends in the History of Systems Philosophy

Robert Drury King
Assistant Professor, Department of Humanities
Sierra Nevada College
999 Tahoe Boulevard, Incline Village, NV
Email: rking@sierranevada.edu

Abstract

This article charts the history of the concept of system in order to establish a set of conceptual trends in the philosophy of systems. Establishing the importance of the German Idealists, and especially Hegel, in this history, we then focus on the system of Leibniz since he marks a decisive turn toward the problem of individuation within the systematic, ontological immanence so important to Hegel and later, Gilles Deleuze. We also concentrate on the Kantian system, however, because the system ontologies of Hegel and Deleuze are defined most clearly as post-Kantian projects. Finally, the article defines the problem of "system individuation" as a recent historical trend in systems philosophy, a project unique to both Hegel and Deleuze.

Key Words: system, individuation, autopoiesis, German Idealism, Hegel, Leibniz, Kant, Deleuze

1. Introduction

Little attention has been paid to the historical development of the concept of system in order to understand what is meant by the term. Yet work outside of philosophy—work in experimental embryology, developmental psychology, sociological theory, even the physical and chemical sciences—has converged on a conception of system which first found decisive focus in the German Idealist philosophical tradition. To be sure, the widespread, even casual, use of the term in the 20th and 21st centuries—we speak readily of 'ecosystems,' 'political systems'—owes a conceptual debt to the German Idealists who first formalized the notion of system as a philosophical concept in its own right. Systems were an obsession of the German Idealists (thinkers such as Kant, Reinhold, Fichte, Bardili, Schelling, Hegel). The notion of a fully-formed and well-founded system established the epistemological, and even ontological, ideal for philosophical speculation and scientific knowledge ('*Wissenschaft*') in the latter part of the 18th century and continuing on well into the latter part of the 19th century. For the German Idealists, systems were a question of a particular brand of philosophical inquiry known as speculation.[1]

Speculation involved the rigorous tracing back of any philosophical or scientific explanation of phenomena to an absolute foundation, both of certainty and coherence, such that the phenomena could be fully justified as irrefutable knowledge. Not high-flown discourses on the nature and proofs of God's existence, but mathematical theorems, stoichiometrical relationships, accounts of the evolutionary genesis of animal forms—all of these species of knowledge stood or fell within a form of speculative, systemic justification. It was the pursuit of the systematic philosophers of the German Idealist tradition to gather a diversity of empirical knowledge and to synthesize it in one master-system, under one unassailable philosophical methodology holding for all knowledge, in logic, nature, and the human sciences (the sciences of the human 'spirit'). This type of philosophy, "systems philosophy," reached a peak, but also a strange dead end, in Hegel's great "scientific" elaboration of system in his magisterial *Science of Logic* (with editions published between the years of 1812 and 1832). However, despite the famous backlash against his system, Hegel's tireless and programmatic efforts at developing the concept of system have begun to attract attention in the humanities and in the so-called 'system sciences' in a range of disciplines driven by empirical research.[2]

Hegel's development of the concept of system was historically special for its tie to the philosophical problem of individuation, which asks how individuals are individualized, taking on discrete identities. Accounts of individuation presume a plurality of individual substances. That is, contrary to any monism of substance, if we accept that there are individuals, then we challenge the notion of the whole (for instance, of the Medieval notion of the universe or '*systema mundi*'). Consequently, all that is left are parts. Of course, questions of parts and wholes, the one and the many, are as ancient as philosophical thinking itself. Yet the problem of individuation flourished in the philosophical literature only with the demise of the idea that one substance maintained a relationship of causal primacy with respect to all others.

[1] For a brief historical review of "speculation" see Rodolphe Gasché, The Tain of the Mirror: Derrida and the Philosophy of Reflection 42-44 (1986).

[2] Klir (1965): The concept of system is one of the most widely used concepts in science, particularly in recent times. It is encountered in nearly all the fundamental fields of science, e.g., in physics, chemistry, mathematics, logic, cybernetics, economy, linguistics, biology, psychology and also in the majority of engineering branches. We are concerned with a very general concept.

As soon as credence was given to the notion that individuals have viable being, in themselves, the conventional notion of system, as a whole or unity of nature, was undermined. Thus, Hegel's philosophy of systems is not about the unity or wholeness of the world. Rather, it endorses the view that the world is composed of gaps, fissures, and relations among parts without any ultimate coherence. Hegel's was an attempt to grasp a world of multiplicity. That said, Hegel did of course endorse the idea that multiplicity and difference, a world of metaphysically isolated individuals, may nonetheless be thought rationally and programmatically. As the idea that the concept of system no longer describes the whole, or the set of all sets, rises to prominence, what comes into being is a set of conceptual tools developed around the task of thinking the independence of, and relations between, a plurality of individuals.

Prior to Kant's famous Copernican revolution in philosophy, rationalist presuppositions determined the problem of individuation as a description of a world where individuals were basic, indivisible substances, or atoms. In such a world, *relations* among individuals mattered less than cataloging the basic atoms of being, and little attention was paid to the dynamic processes undergone by individuals (such as change, decay, or adaptation to novel environments). Such fully dynamical processes could only be looked on as accidents of atomistic substance, not as the very essence of individuals. However, in 19th century chemistry, for example, studying chemical substances became a question of stoichiometrical relationships among elements in dynamic interactions such that atoms were defined by their reactivity potentials rather than their atomic composition. Here, an atom of iron (Fe) is defined less by the number of protons it carries than by the fact that it undergoes very different changes in its behavior in the presence of water and atmospheric oxygen (rust) than it does in the cells of living organisms (nutrient).

Following such insights, research in systems in the 19th and 20th century, in both science and philosophy, discarded and undermined this world that matched so well with classical thermodynamics and replaced it with a vision of dynamic systems operating at far-from-equilibrium conditions. It is not often recognized, however, to what extent it was Hegel and his German Idealist contemporaries who provided the conceptual resources for such a shift in worldview. One might even be tempted to read Goethe's *Elective Affinities*, holding for the ruin of monogamous sexual intercourse, as a key text in affirming this new worldview which places primacy not in individual substances, but in the dynamic relations and processes among individuals. Most 19th century notions of systematicity stated, then, that if an individual (an atom, a tree, a society) is to reveal the nature of its identity and the full range of its behavior, it must be studied in its interactions with other individuals in a *systematic* fashion.

2. Philosophical Roots of the Concept of System

But what is a system? The term 'system' comes from the Greek "sustema" (*syn histemi)*, meaning "to stand or put together" and referring to the process of organization of that which is put together, a complex unity, whole or body. 20th century systems scientist and progenitor of General Systems Theory, Ludwig von Bertalanffy traces the origin of system back even further to the ancient Greeks and Aristotle:

> Philosophy, and its descendant, science, was born when the early Greeks learned to consider or find, in the experienced world, an order or kosmos which was intelligible and hence controllable in thought and action. One formulation of this cosmic order was the Aristotelian worldview with its holistic and teleological notions. Aristotle's statement, "the whole is more than the sum of its parts," is a definition of the basic system problem which is still valid.[3]

The term 'system' comes from the Greek "sustema" (*syn histemi)*, meaning "to stand or put together" and referring to the process of organization of that which is put together, a complex unity, whole or body. The Stoics appear to have used the term consistently in two distinct ways, to refer to the order of the cosmos or, in logic, to refer to the conclusion following from a set of conditions. Here, system represents the *logos* of these conditions.[4] At the dawn of the scientific revolution, system appears to have acquired an especially scientific status in astronomical cosmology. Roland Faber reports:

> There it was used for the *systema mundi*, the world-structure, thereby—as in Copernicus—distinguishing the cosmos *itself* as a system of reality from hypotheses *on* the structure of the cosmos.[5]

The term underwent no significant morphological or semantic change in its Latin form; and it was borrowed directly by French and English only in the first half of 17th century.[6] Not then prevalent in the common languages of Western Europe, system does appear to have been put to immediate philosophical use.

[3] Bertalanffy 1950, 12.
[4] Faber reports this in Hager, "System: I Antike," 824.
[5] Faber takes this definition from Siegwart, "System," 183-184.

Johan Micraelius included the term in his 1653 *Lexicon philosophicum terminorum philosophis usitatorum*. There, "*systema est compendium, in quod multa congregatur*," a compound of many in respect of its congregation. Roland Faber writes of Micraelius' definition that "*unity* is the aim, but the basic fact on which this definition focuses is *multiplicity*."[7] He adds that "system by definition is not an idea, but a *problem*. It presents the problem of a multiplicity that evidently exists beyond unity and stubbornly resists any act of unification."[8] Faber's remarks remind us that, true to its etymological origin, the term system retains, in this early philosophical form, a dialectical thrust: a conceptual focus on the *problematic* and *inter-relational* being proper to any system. Including contemporary definitions, systems have almost invariably been defined as problematic structures of elements in relation, where the problematic aspect refers to the question of how it is that systemic elements relate. William Desmond offers a helpful gloss on this point:

> '*Sustema*', deriving from '*sunistanai*', refers us to a togetherness (*sun*) that is brought to stand (*histanai*). That *sustema* brings a togetherness to stand suggests less a block unity than a 'being with'--a between of relation. The question is the character of this between of relation, the how of the togetherness, the openness of it, of how closed it is or must be on itself.[9]

Most generally, then, a system appears to be a structure of elements in a relation that produces an individual (system), organized in a variety of ways (in varying degrees of openness and closure).

By the end of the 17th century the term system was used widely in the scholarly disciplines to acknowledge a more and less precise *method* for seeking knowledge and conferring unity to whatever subject under investigation.[10] As Reinhard Brandt points out, seventeenth-century methodological reflection is characterized by the deployment of "two different approaches to the issue of how scientific knowledge is possible, the *mos geometricus* and the *mathesis universalis*."[11] *Mos geometricus*, put forward most famously by Descartes and stemming from Euclid, attempts, through *resolutio*, or analysis, to:

> reduce any given problems or propositions to indubitable axioms or simple elements, and, going, in the opposite direction, through synthesis—as practiced by Euclid himself, according to Descartes—to give the solution of the problem or the proof of the proposition. Analysis and synthesis are linguistically formulated, generally in syllogistic form, and intuitively controlled. The *mos geometricus* is, in other words, a procedure for decision-making and exposition.[12]

Moreover, *mos geometricus* was used famously in Spinoza's *Ethics* as an expository procedure for system-building. Conversely, *mathesis universalis* is a rather more formal procedure that performs algebraic calculation via artificial symbols and rules of conversion to generate materially new knowledge. In the seventeenth century, then, the concept of system splits into two significations, divided between two distinct methodologies.

It is also clear that in the 17th century *mos geometricus* links with the modern ideal of the primacy of critique, rooted in Descartes' view that 'first philosophy' must begin by resolving the question of what and how we know and that only on that foundation can any other paramount philosophical concerns be addressed. If critique begins with the subject reflecting on the conditions of knowledge, then everything else would relate in a systematic fashion to the ground of knowledge in rational subjectivity.[13] The Cartesian concept of system is in this way connected to Descartes' views about putting everything on a new foundation, with each subsequent claim built on what has come before and ultimately linked to what is most primal. Here, we the idea of building a system of principles links with an architectural signification. Of course, Kant would later develop an architectonic of reason, while he specifically conceived of reason as a system.[14] But perhaps the more profound determination of system following in the wake of Descartes is a mathematical rather than architectural one (though both significations entail notions of limits, one as a key concept in calculus and the other as a building support or constraint). Tom Rockmore notes:

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6 An Etymological Dictionary of the English Language by the Rev. Walter Skeat, Clarendon Press Oxford, 1924.

7 Faber 2004.

8 *Ibid.*

9 Desmond 2007, esp. p. 16.

10 Faber cites Clemens Timpler, *Metaphysica systema methodicum* (Hanau, 1606).

11 Brandt 1999, 28.

12 *Ibid.*

13 Rockmore 1993, 15: "After Descartes, a new rationalism appears based on the principle of the complete transparency of all phenomena with respect to reason. There is no longer any effort to group together different parts of the theory, but there is an effort to think the concept of a limit without limits of any kind."

14 *CPR*, B860-61. "By an architectonic I understand the art of constructing systems. As systematic unity is what first raises ordinary knowledge to the rank of science, that is, makes a system out of a mere aggregate of knowledge…."

> The essential insight to create a system is to understand the relation between mathematics and the real world. This relation goes back to Pythagoras of Samos and his school….The concept of an unlimited system of a mathematical type dominates modern rationalist thought, for instance, in the writings of such philosophers as Descartes, Leibniz and Spinoza, where it serves as the criterion for philosophical rigor.[15]

This 17th century concept of system-creation reaches a veritable apex in the thought of Isaac Newton, who titled the third book of his *Principia*, "The System of the World." While Newton's notion of system suffers wholesale rejection by the 20th century systems scientists (Bertalanffy, Prigogine, etc.), we ought to sketch the preponderant features of his systemic worldview:

1. There is, ultimately, one system of the world, governed by immutable, universal laws.
2. The system is transparent since its behavior is, in theory, completely predictable.
3. It is, finally, closed rather than open because ordered statically (it is not constantly, and spontaneously, reorganizing itself at far-from equilibrium conditions; it is not open to flows of matter and energy from external environments). It runs at or near equilibrium.
4. Its code, or structural parameters, follows one set of rules throughout its behavioral trajectory. The whole it forms is the sum of its parts (which are externally related).
5. In sum, the Newtonian system is closed, deterministic and reversible—there is no time factor—and its effects are proportionate to its causes.

Ilya Prigogine infamously condemned the fourth point we have assigned to Newton, accusing his system of making recourse to "a dead, passive nature, a nature that behaves as an automaton which, one programmed, continues to follow the rules inscribed in the program."[16] Mark C. Taylor adds a perspicuous gloss on Prigogine's charge, "Newton's world is in effect a machine ruled by abstract laws, which are imposed upon it. While Prigogine's language suggests the model of cybernetics or computer technology, the more common image for the Newtonian universe is the clock."[17] By clock, Taylor means mechanical devices whose designs are not implicit in the structure of their components and which presuppose a designer.

Recall what the etymology of the system term has revealed: that systems, at their most basic, are problematic structures of elements in relation. Newton's system, then, is not in a problematic relation of feedback to its environment. Any Newtonian feedback relations are internal to the system. There is no question, for Newton, of fitting a system to its environment. Hegel's description of the living being, by contrast, falls under Bertalanffy's organismic definition of an "open" system because the living being is a teleological category which states the world as a series of interacting circles or wholes where relations between wholes are not imposed externally. Thinking of Newton, Hegel remarked in his *Science of Logic*:

> This is what constitutes the character of *mechanism*, namely, that whatever relation obtains between the thing combined, this relation is one extraneous to them that does not concern their nature at all, and even if it is accompanied by a semblance of unity it remains nothing more than *composition, mixture, aggregation*, and the like.[18]

By contrast, the first evidence of an organismic conception of system in the modern period of Western philosophy can be found in scattered texts in the *oeuvre* of G.W. Leibniz. As well, Leibniz's doctrine of relations among substances proved to be a paramount conception in the system ontologies later developed by dialectical thinkers such as Hegel, but also by thinkers who explicitly rejected Hegel dialectic, notably Gilles Deleuze. Both Hegel and Deleuze affirmed the Leibnizian idea that the changes in one monad, or substance, were reflected in the very order and structure of the universe according to a dynamic, non-classical conception of mechanics. No doubt, too, both Hegel and Deleuze admired Leibniz's precocious gesture of modeling the interactions of all substances on the idea of the animal organism, an idea that would also inspire proponents of the General Systems Theory and cybernetics in its first and second waves, each energized by the unity of the sciences movement of the 1930s-50s. A more immediate precursor to Hegel's, and probably Deleuze's, interests in the organism, and especially in organic form, was Immanuel Kant. Unlike Leibniz, Kant had it that organic form was a result of autopoietic processes of generation. Immanuel Kant's own, very important influence on the ontologies of Hegel and Deleuze represents a competing conception of systems than that which we can gather from Leibniz's writings. Still, both Hegel and Deleuze remain Leibnizian in their pursuits of an ontology of systems and in their rejection of the epistemological turn in systems philosophy taken by Kant.

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[15] Rockmore 1993, 28.
[16] Prigogine and Stengers 1984, 6.
[17] Taylor 2001, 79.
[18] *Science of Logic*, 711.

We shall briefly review the notions of systematicity at work in Leibniz and Kant before finishing the task we have set of defining an ontology of system individuation in Hegel and Deleuze.

3. Leibniz and System Individuation

In 1695, Leibniz published his *Systeme nouveau de la nature et de la communication des substances*.[19] This essay is the first in which the concept of system is linked with the problem of individuation in an identifiably *philosophical* program, though the system concept itself is not there subject to philosophical analysis.[20] Leibniz's 'new system' develops systematicity as the establishing of general principles capable of constituting or individuating the 'real unities' of a multiplicity or manifold in nature. Leibniz's understanding of systematicity was put in the service of a metaphysical view of the world. It was through a systematic worldview that Leibniz attempted to explain how postulating dynamically organized unities in nature, and even matter, could yield more results about the operations of nature than merely mechanistic accounts. Leibniz explained:

> …having tried to go more deeply into the principles of mechanics themselves in order to explain the laws of nature which are known through experience, I realized that the consideration of mere *extended mass* is insufficient, and that use must be made of the notion of force, which is perfectly intelligible, though it belongs to the sphere of metaphysics…I saw that it is impossible to find the principles of a real unity in matter alone, or what is only passive, since this is nothing but a collection or aggregation of parts *ad infinitum*.

Viewing matter as a passive collection of parts is insufficient to explain the principles accounting for the 'real unities' within nature, such as organisms.[21] Real unities of force were the only true substances for Leibniz. Leibniz's originality in the new system was, then, to sketch a doctrine of substance as *principle of activity or spontaneity* in order to explain the laws accounting for the genesis of form and order in nature.[22] There is some debate in the literature on Leibniz's thought about whether the new system represents a change in his outlook on the theory of substance,[23] but from the perspective of later system philosophy, it is clear that it does. The new system is a foundational text for later developments in system philosophy[24] (where Spinoza's *Ethics* or Descartes' *Meditations* are not) because of the way in which Leibniz there understands nature no longer as purely passive, extended matter, subject to efficient causation, but through the active, and spontaneous, individuating power of a principle of force or action within individual substances:

> So I find that in nature it is necessary to employ not only the notion of extension but also that of force, which makes matter capable of acting and resisting. By force or potency I do not mean a power or a mere faculty, which is only a bare possibility (une possibilité prochaine) for action and which, being itself dead as it were, never produces an action without being excited from outside; instead I mean something midway between power and action, something which involves an effort, an act an entelechy—for force passes into action by itself so long as nothing prevents it. That is why I consider it to be what constitutes substance, since it is the principle of action, which is its characteristic feature.[25]

Leibniz's new system is every bit a theory of individuation for a viable plurality of substances. Such a conceptual program continued to motivate Leibniz's most accomplished statement of his system,

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[19] "Not long after its public presentation in the Journal des savants article of 1695, Leibniz's 'New System of the Nature of Substances' became the increasingly famous 'system of pre-established harmony between substances." R.S. Woolhouse and Richard Francks. *Leibniz's 'New System' and Associated Contemporary Texts*. Clarendon Press: Oxford, 1997. P.2

[20] "None of his books can exactly be looked as giving a complete systematic account of his philosophy…. His philosophy is…scattered through various little treatises which were written in various connections, in letters, and replies to objections which caused him to bring out one aspect of the question more strongly than another; we consequently find no elaborated systematic whole, superintended or perfected by him." Hegel, *History of Philosophy*, V. III. P. 328 "The most inspiring but also most puzzling aspect of Leibniz's philosophical thought is his conception of substances as monads. Unfortunately, he never managed to offer its fully developed and systematic presentation….What we now take to be the most precise summary of Leibniz's system, his Monadology, was written when Leibniz was almost seventy years old." Predrag Cicovacki. *A Companion to Kant*. Ed. Graham Bird. Rockmore 1993, especially pp. 14-15 notes: "After Aristotle, others, for instance Thomas Aquinas, begin to give a systematic form to their writings. Yet the problem of the nature of a philosophical system is not yet posed."

[21] Opposing the mechanistic scientific explanations of his day, Leibniz viewed nature as a kind organism.

[22] Parkinson 1973, p. xviii: "One may not, he says, use souls or forms to explain particular physical events; such events must be explained in mechanistic terms. He insists, however, that the principles of mechanics themselves cannot be stated adequately without a reference to forms."

[23] C.Wilson, *Leibniz's Metaphysics*. Ch. 5

[24] "As with every new idea in science and elsewhere, the systems concept has a long history. Although the term "system" itself was not emphasized, the history of this concept includes many illustrious names. As "natural philosophy," we may trace it back to Leibniz" (Ludwig Von Bertalanffy, *General System Theory*, 11).

[25] From one of the 'drafts' of the New System, 1695. See Woolhouse and Francks, 1994.

the *Monadology*.[26] Not incidentally, the etymology of the term 'monad'—from the Greek "monas," meaning "one," "unit" or "unity"—also demonstrates the term's historical connection with the etymology of the term 'system.' While there is very much diversity in Leibniz's account of systemic individuation from the *New System* to the *Monadology* and beyond, his philosophy consistently articulates systematically derived principles of individuation, even if it does not yet present the kind of *immanent* ontology of system individuation characterizing post-Kantian systems ontologies, such as we find in Hegel and Deleuze. For example, the pre-established harmony of the Leibnizian monadology would be refused by the requirement of immanence in the Hegelian and Deleuzian systems. As well, Leibniz's *apperceptio* remained a species of external reflection since its Ideas were given to it independently of reflection, rather than synthesized by it immanently. That is, for Hegel and Deleuze, systems are not simply first principles or posits, but are shown to derive from analyzing what it means to be an individual, *uberhaupt*.

4. Kant and the Autopoietic Turn to System Immanence

From the point of view of the requirement of immanence for systems, both Hegel and Deleuze admired the Kantian system's model of self-consciousness as self-determining activity that synthetically constitutes its object. It is a credit to Kant's meditations on the ideas of reason that systems (of understanding) are shown to derive from analyzing reflection itself (what Kant called reason, or *Vernunft*). For Kant, systematicity is not pre-established, but is the result of the kind of careful scrutiny belonging to human cognition. In the Kantian world, thought proves to be systemic because it generates its own problems, distinctions and concepts. However, the question remains for system philosophy whether Kantian systemic immanence pertains to human cognition alone (where Hegel and Deleuze grant systemic immanence to *all* being). The strong distinction Kant draws between sensibility and understanding suggests that it does. And both Hegel and Deleuze criticized the vestiges of transcendence that remain in Kant's system. Namely, both faulted Kant for maintaining that Ideas— immanent systems—of reason—are not found in nature, but only in the mind. The question for systems philosophy is whether Kant was drawn to the rigid distinction between thought and sensibility for specifically systemic reasons.

With works like Christian Wolff's *De differentia intellectus systematici et non systematici* (1729),[27] De Condillac's *Traite de systemes* (1749), and H.J. Lambert's *New Organon* of 1764, it is clear that by the 18th century the philosophical definition of system signifies less a being in its own right than a doctrine of method, [28] and systems articulate not actual things in the world, but are epistemic theories used to classify things. For instance, In his *Traite de systemes*, De Condillac offered the following definition of system:

> Every system is nothing else but an arrangement of different parts of some art or science in a certain order in which they mutually support each other and in which preceding parts explain the following ones. The parts, which explain the other parts, are called principles, and the fewer principles, the better the system, so the perfect system should have only one principle.[29]

De Condillac's criterion of methodological simplicity for systems applied not to things, but to the concepts or principles used to understand things. The attraction of such methodological simplicity, with its critical-theoretical caution, appears to have left its mark on the Kantian system. After the spirit of De Condillac, Kant thought "what is peculiarly distinctive of reason…is that it prescribes and seeks to achieve its *systematization*, that is, to exhibit the connection of its parts in conformity with a single principle."[30] That is, reason draws inferences from our judgments for the purpose of unifying our a-posteriori knowledge into ever larger, more general principles (such as the movement whereby judgments connect inferences to form syllogisms). For the Kant of the *Critiques*, it was the systematization not of things themselves, but of our concepts of things, which defined this conformity with a single principle and which set the tone for his Critical philosophy. Kant's conception of system went through a few phases, ultimately revealing an increased concern for the existence of a form of systematicity in the natural world. Yet Kant never drew the conclusion that nature was in-itself a system or that it was composed of actual systems. A schematic treatment of conceptions of systematicity in Kant's *Critiques* allows the following quick conclusions: the *Critique of Pure Reason* assigns a systematic ideal for our empirical knowledge, but confines its application to a regulative or hypothetical employment—a rule without application to any empirically real cognition;

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[26] Leibniz regarded the Monadology, as "the best summary of his philosophy." See Catherine Wilson. "The Reception of Leibniz in the Eighteenth Century." *The Cambridge Companion to Leibniz*. Ed. Nicholas Jolly. Pp. 442-474.
[27] Rolf Ahlers refers to Wolff's work as "the first explicitly "metasystematic" book.
[28] "At the end of the 18th century, the philosophical notion of system was firmly established as a constructed set of practices and methods usable to study the real world." Francois, Charles. Ibid.
[29] De Condillac, 1749, 1983, p. 3.
[30] *Critique of Pure Reason*, A645/B673. Emphasis mine.

the *Critique of Practical Reason* attempts to formulate how Kant's principle of a spontaneous synthetic unity of apperception attains its effective self-actualization; finally, the *Critique of Judgment* presupposes an *actual* systematicity in nature and elaborates a complex, transcendentally ideal systematicity in human cognition, though it refuses granting systems any actual being in nature. In the *Critique of Pure Reason* Kant assigns to the systematicity of reason an immanence lacking in the Leibnizian system. Reason maintains a concern with *its own* realization: it sets its own tasks and demands their realization in an infinite regress of searching for conditions and first causes, but never making recourse to a principle other than itself. Kantian immanence for systems means just this, that reason represents an unconditionedness with respect to external determination. Our question is whether Kantian systems reach *ontological* rather than a form of epistemological, methodological or practical immanence. In the Appendix to the 'Regulative Use of the Ideas of Pure Reason' in the *Critique of Pure Reason*, Kant warned off anything more than a formal-logical application for systems. He declared, "[t]he systematic unity (as a mere idea) is, however, only a *projected* unity, to be regarded not as given in itself, but as a problem only"[31] As John Zammito argues, "this end remained a mere "postulation," Kant claimed. While it could serve as the *criterion of the truth*" of its operations, it could not be taken as actual. It was, Kant argued, "a *logical* principle."

In his concern with the methodological and epistemic function of system principles, Kant's conception of system remained very much a product of his century. But the question of the *actuality* of systems is crucial to the ontological status of systems, such as Deleuze's or Hegel's. The question of the actuality of systems necessitates the question of their immanence to thought, to nature, to themselves, and to what these terms signify within system philosophy and its conceptual history. Returning to the German Idealists, then, they believed in general that because Kant had left the principles of the organism, including teleology, merely regulative, his notion of organism could not serve the interests of science, or *Wissenschaft*. Such a systematic science had wanted to make the life sciences exact, or actual, part of a system of reason that would be constitutive of being and knowledge. It can of course be asked if Hegel (or Schelling, for instance) does not go too far in making reason the *a-priori* origin of the principles of the life sciences and of the organism—after all, Hegel claims to *deduce* these principles. What is at stake in this question is whether there is a system of systems (philosophy, for example) in which the various parts of science, or reason, may be unified, guided by the same logical principles and, more importantly, working according to the same fundamental laws. Schelling holds this view in his *Ausgewahlte Schriften* (*AS*).[32] Hegel, on the contrary, appears less ambitions that the Schelling of the *AS* since he clearly shows that the systems of nature and spirit retain a robust sense of autonomy when treated in the Encyclopedic system.[33]

While it is commonly acknowledged that the great "system-builders"[34] in the tradition of German Idealism—Fichte, Schelling and Hegel—sought something of a post-Kantian return to Leibniz, it is less well known to what extent this return owed to the influence of Solomon Maimon.[35] We should note in passing Deleuze's significant debt to Maimon. However, Maimon represents only one of the major conceptual and historical trajectories within systems philosophy up to the present. There appear to be three post-Kantian trajectories: 1) Maimon's *Koalitionsystem*, which is partially defined by a return to Leibniz's philosophy (but with a rejection of any pre-established harmony for systems), 2) Reinhold,[36] Fichte, Schelling and Hegel (who all pursue something of a Cartesian strategy towards systems before more and less completely abandoning it), each of whom more and less respond to Kant's efforts at systematization as a project of deducing foundations; 3) Schlegel, Novalis and those romantics who criticize system-building or at least the construction of systems whose designs would remain the same regardless of the contents they apply to or construct.[37]

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[31] Zammito, 1992.

[32] See Vol. 4, 375. Darrell Arnold has pointed us to this text.

[33] Such a reading is also enforced by William Maker, who draws a strong distinction between logic and the *Realphilosophie* (nature and spirit). See Maker 1994.

[34] Caws 1974, 2-3. Where Caws points out that the term "system-builders" has been used pejoratively, especially in the analytic movement. For analytic thinkers, says Caws, systems are they types of things one discovers rather than builds.

[35] For the space of this essay we cannot grant Maimon the importance he deserves in this history. Readers are advised to consult Frederick Beiser's "Maimon's Critical Philosophy," pp. 285-302. Cf, *The Fate of Reason: German Philosophy from Kant to Fichte*, 1993.

[36] Reinhold is widely regarded as the first thinker to thematize the relationship between system and foundation in a post-Kantian context, marking a return to the Cartesian systematic ideal.

[37] Pirmin Stekeler-Weithofers reports: "Long before Wittgenstein criticized theory-building in philosophy, Friedrich Schlegel and Novalis, romantic followers of Fichte in Jena, had launched a similar critique against philosophical systems in their writings. Novalis says in a famous text with the working title "Pollen" (*Blüthenstaub*) that all those who construct ready-made systems in philosophy do so in order to avoid the difficult task of reflection." See his "The Question of System: How to Read the Development from Kant to Hegel." *Inquiry*. Vol. 49, No. 1, 80-102, February 2006, p. 80.

This last trajectory might include the later philosophies of Kierkegaard and Nietzsche[38] and is associated with a preference for non-systemic forms of philosophy as well as something of a suspicion of the very will itself toward systematization.

5. Hegel and Foundationless System Ontology of Individuation

Common to the second trajectory, the conventional representatives of German Idealism, is the attempt to provide the Kantian philosophy with a refined, one might say more systematic, concept of system. This effort reaches its apogee in the work of Hegel, in the first third of the 19th century. Surely, the Hegelian philosophy marks something of a terminal point in the philosophical development of the concept of system where it is presented, as with Deleuze's system ontology, as an immanent ontology of individuation. This terminal point might be conceived after A. Alvarez's assessment of aesthetical style in Samuel Beckett's novel trilogy.[39] Like Beckett's trilogy, the Hegelian system seems to presents what Alvarez referred to as "a terminal vision, a terminal style," a terminal (philosophical) work "from the point of view of possible development." The Hegelian system marks a terminal philosophical style inasmuch as it features an overturning of the Cartesian paradigm of foundations. In a sense, Hegel pushes Descartes' to the limit where his method is overturned. Hegel's *Science of Logic* establishes that the most logically rigorous foundation is a strict non-foundationalism. Hegel defines systems philosophy without any given foundations as the withdrawal from the presupposed content of the exterior world in virtue of an abandonment of the traditional forms of reflection (similar to what Deleuze calls "representation") on that external world. Hegel achieved this rather rarified style by pushing the Leibnizian system to its limit, and within that system, by eliminating all traces of any (Kantian) external reflection.

Hegel's ontological commitment to this kind of systemic immanence—defined most signally by the development of categorial individuations that demonstrate the consistency of his repudiation of any foundational givens—most clearly defines his system as the historically and conceptually seminal *foundationless system ontology of individuation*. Indeed, scholars such as Kenley Royce Dove, Richard Dien Winfield, and William Maker[40] have argued that Hegel's terminal philosophical style, with its withdrawal from the world of presupposed contents and forms of reflection, results most directly from the systemic immanency of his logical ontology, expressed most rigorously in the *Science of Logic*.[41] William Maker expresses this point well: systematicity in systematic philosophy means, first and foremost, this internal immanent or self-generative feature, and the alleged autonomy and rigor of systematic philosophy— its claim to being science—is a function of its immanency, an immanency the condition of possibility of which is the attainment of a presuppositionless starting point.[42]

By systematic philosophy, Maker means Hegelian philosophy. Here, then, systematic methodology combines 1) presuppositionless philosophy, emerging from a critique of modernist foundationalism and its subject-object epistemology, with 2) a theory of individuation of immanent, categorial individuations arising from the collapsing of subject-object epistemology and traditional forms of representation, (again, much like Deleuze's own critique of representation). After Hegel, such a system program—foundationless system ontology of individuation—makes little if any conceptual advance. The project is largely missed or misunderstood, comes under attack, and is abandoned before the 20th century. In the 20th century this Hegelian development of system is criticized—but also revitalized—by Gilles Deleuze. Yet Hegel's ontology of system individuation continues to inform contemporary accounts of system individuation—for instance, Deleuze's—because these later accounts keep with Hegelian system requirements and operations (dynamics and constraints). For instance, as with Hegel's, Deleuze's ontology of system individuation confirms:

[38] Rockmore 1993, 12. Daniel Breazeale refers to Nietzsche as "an aphorist suspicious of the very will to systematic comprehension." One also thinks of Kierkegaard's joke in the *Concluding Unscientific Postscript* about how he had almost kneeled down before the Hegelian system before discovering that its completion had been put off until the following Sunday.

[39] "Together they [Molloy, Malone Dies, the Unnamable] constitute an undeviating withdrawal from both the exterior world and, it goes without saying, the traditional novel in which that world has always been reflected. What remains is a terminal vision, a terminal style, and from the point of view of possible development, a work at least as aesthetically terminal as *Finnegan's Wake*." *Beckett*. A. Alvarez. The Woburn Press. London, 1974.

[40] These thinkers unique reading of Hegel's *Logic* as a "philosophy without foundations" or "without presuppositions" forms a distinct interpretation of Hegel. Cf., fn. 99, Stephen Houlgate's "G.W.F. Hegel: An Introduction to His Life and Thought." Houlgate and Baur Eds., *A Companion to Hegel*. Sussex: Wiley-Blackwell, 2011.

[41] One may take any of the Logic's published versions and find the essential arguments for the claims we are making about the Hegelian system's essential foundationlessness.

[42] Maker 1994, 49.

1. Immanence. The ontology of system individuation (OSI) accepts no gap between a transcendent beyond and the world, or between thought and being, because being relies on its own resources to generate an order of intelligibility out of its own content.

2. No distinction between epistemology and ontology. For both Hegel and Deleuze, system principles necessitate that transformations in knowledge are transformations in the objects of knowledge. (Here, each follow but radicalize Kant's insight that the conditions for the possibility of knowledge are also conditions for the possibility of *the objects* of knowledge).

3. OSI is self-referential (self-organizing or autopoetic, as Deleuze defines concepts in his *What is Philosophy?*[43]), taking into account the manner in which systems immanently cause and spontaneously generate themselves. Such self-reference occurs for both Hegel and Deleuze in the form of system-specific contradiction or paradox, which paradox is metabolized by the system, generating the system in processes of continuous transformation.[44]

4. OSI establishes the necessity that the beginning or starting point of philosophy (here, the genesis of the system itself) must be both immediately grounded and absolutely or ultimately grounded, while the ground offers intelligibility for the beginning.

5. OSI must be relational and differential. Relational, in the sense that it is able to account for the interrelationality of individuals including between any individuated individual and the system itself; differential, in that it is not based on the idea of traditional substances, but on the idea that individuated actualities are a *result* or effect of processes of specific determination (e.g., principles of difference). This is for Hegel and Deleuze the problem of 'thinking difference' or of 'individuation' in immanent systems.

6. OSI necessitates that any ontic knowledge such as that found in regions of being or specific sciences and practices, for instance, biology, economics, sociology, physics. As ontology, systems ontology has a universal import and inquires into the common structure of the being of all beings.

All of these points circulate around the common idea of a repudiation of traditional appeals to a privileged given (e.g., any empirical given or axiomatic first principle).

6. Conclusion

Now, if both Hegel and Deleuze revealed a preference for Leibniz's concept of system, it is because Leibniz affirmed the ontological status of systems and assigned systems a generative role in the production of individuals. Hegel's originality in systems philosophy was to combine the ontology of Leibniz with the demand for unconditionedness from external determination, the demand for immanence, in Kant's Critical philosophy. In this sense, Hegel's system composes an immanent ontology of system individuation. Deleuze is Hegelian inasmuch as he pursues this same philosophical project. Appearing at first blush to be very strange bedfellows, Hegel and Deleuze have staked out a unique, but common conceptual trajectory in the history of systems philosophy.

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[43] *What is Philosophy?*, 11. Deleuze and Guattari declare: "But the concept is not given, it is created; it is to be created. It is not formed but posits itself in itself—it is a self-positing. Creation and self-positing mutually imply each other because what is truly created…thereby enjoys a self-positing of itself, or an *autopoetic* characteristic by which it is recognized."

[44] *Difference and Repetition*, 227. For Deleuze, "Philosophy is revealed not by good sense but by paradox. Paradox is the pathos or passion of philosophy."