C. S. Peirce and Stuart Kauffman

EVOLUTION AND SUBJECTIVITY

by William P. Kiblinger

Abstract. Evolutionary theory is becoming an all-encompassing form of explanation in many branches of philosophy. However, emergence theory uses the concept of self-organization to support yet alter traditional evolutionary explanation. Biologist Stuart Kauffman suggests that the new science will need to tell stories, not simply as a heuristic device but as part of its fundamental task. This claim is reminiscent of C. S. Peirce's criticism of the doctrine of necessity. Peirce's suggestions reference Hegel, and this essay draws out this Hegelian background, addressing the question of subjectivity and issuing some Hegelian reminders so that such evolutionary and emergent theories will consider the implication of this research program on philosophy of mind. The primary focus is on two post-Kantian, neo-Hegelian thinkers in contemporary philosophy who deal with this problem: John McDowell and Robert Brandom.

Keywords: adjacent possible; Robert B. Brandom; complexity; consciousness; emergence; evolution; habit; G. W. F. Hegel; Stuart Kauffman; John McDowell; Charles Sanders Peirce; purpose; purposiveness; second nature; self-organization; subjectivity; supervenience

In contemporary philosophy, more and more attention is being paid to evolution as the principle of explanation. Evolutionary theory is frequently applied to many branches of philosophy. It is used in philosophy of mind to explain the development and nature of mental content and consciousness; in ethics to explain altruism, care, and responsibility; in epistemology to explain the development of doxastic practices and justificatory schemes; in aesthetics and political philosophy to explain the development and

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dissemination of memes; and so on. The theory, it seems, can be used to explain almost anything. Regardless of the object of inquiry (*explanandum*), the method of explanation (*explicans*) remains evolutionary theory.

This trend in philosophy represents the latest chapter of a longer trend of naturalization and disenchantment. The emphasis on change in evolutionary theory, however, offers an alternative to the materialist naturalism that treats temporality and the directionality of time as irrelevant to the nature of things. Evolutionary theory makes history relevant to explanation in a way that mechanistic explanation does not.[1] It treats the physical world as organic rather than mechanistic, and this difference represents an opportunity to move away from some forms of disenchantment.

Furthermore, evolutionary biology recently has witnessed the revival of a post-Kantian idea: inner teleology. Kant's retrieval of Aristotle's teleology in the form of "purposiveness without a purpose" became a guiding theme for many post-Kantian philosophers, and it seems to be resurfacing now in the complexity sciences, including in particular Stuart Kauffman's work on self-organization. Where evolutionary theory once occupied the position of ultimate explanatory theory, emergence is now usurping that role. In the following, I situate Kauffman's suggestion in the context of Charles S. Peirce's work, follow up on the Hegelian echoes present in it, and then offer some concerns about how emergence theory might function in contemporary philosophy of mind.

In Peirce's essay "The Architecture of Theories" he claims that "the only possible way of accounting for the laws of nature and for the uniformity in general is to suppose them results of evolution" (Peirce [1891] 1974, 6:15). This is an interesting claim—that the laws of nature are the results of evolution. To see laws as the product of evolution is to presuppose that they are not absolute. The implicit contingency of natural laws viewed as evolutionary products becomes manifest in the minute discrepancies involved in any application of the laws to reality. As Peirce claims, there is always a "certain swerving of the facts from any definite formula" ([1891] 1974, 6:15), and this is not always and only because of the imperfections of our techniques of observation.

The consequence of this view is that the laws of nature cannot be absolute (true in every instance of reality) or deterministic (based on mechanical principles). Peirce's reasons for this are that (1) purely mechanical laws presuppose an extraneous cause beyond the process; (2) law results from evolution, not the other way around; (3) mechanical laws can explain only homogeneity, not heterogeneity; and (4) mechanical laws are reversible, but growth is not ([1891] 1974, 6:15–16).

The third and fourth points are especially relevant to a discussion of Kauffman. According to the third, it would be illogical to treat natural laws as absolute and deterministic because doing so would fail to address the heterogeneity of the universe. Only homogeneity can result from ex-

act law, whereas experience shows us an abundance of arbitrary heterogeneity. In Darwinian terms, we need accidental variations in each iteration of the selection process. In another sense, Kolmogorov complexity seems to be involved here: that the complexity of information (in the form of a string) can be—and mostly is, according to Gregory Chaitin—as complex as the program that generated it. That is, there is much heterogeneity in the world that cannot be captured by anything simpler than a program of equivalent heterogeneity or complexity. Peirce's claim that we need more than a mechanistic explanation to account for the heterogeneity of natural products, let alone human artifacts, sets the stage for evolutionary biologists and later complexity theorists to reconsider what we mean by laws of nature—and to do so without throwing up our hands in intellectual surrender and declaring "irreducible complexity" when mechanistic explanation fails, which differentiates the science of Kauffman's work from any employment of "complexity" by proponents of Intelligent Design.

According to the fourth point, the conservation laws amount to the reversibility of mechanical operations; thus, growth would not be explicable by such operations. This connects to one of Peirce's arguments against strict determinism. According to the determinist, Peirce writes, chance is unintelligible because it demands the acceptance of arbitrary givens without disclosing "to the eye of reason the how or why of things" ([1892] 1974, 6:38). In response to this charge, he argues that determinism requires no less swallowing of arbitrary givenness in the form of "immutable and ultimate facts" for which no account can be offered (6:41). The only difference is that in this case the facts are all given up front at once—a bitter pill that can be swallowed and then forgotten only at the expense of self-delusion. Instead, Peirce suggests that we acknowledge the immense amount of change in the universe and recognize the implications of it: "the history of states, of institutions, of language, of ideas . . . paleontology . . . changes of stellar systems. Everywhere the main fact is growth and increasing complexity" (6:40–41). He cites Hegel in this connection: "Hegel discovered that the universe is everywhere permeated with continuous growth (for that, and nothing else, is the 'Secret of Hegel')" (Peirce [1903] 1974, 1:18). (I return to the Hegel connection in a moment.)

From these facts of change and growth all around us, Peirce infers that "there is probably in nature some agency by which the complexity and diversity of things can be increased; and that consequently the rule of mechanical necessity [determinism] meets in some way with interference" ([1892] 1974, 6:41). This "agency in nature" that interferes with strict mechanical necessity can be understood as Kauffman's addition to Darwinian evolution. The random mutations involved in the process of natural selection are important. In Kauffman's work, however, such processes require a further agency, beyond random mutations, to explain the growth

and increasing complexity of the universe, so Kauffman introduces self-organization to explain the emergent properties of a complex system. It is to this extra agency that I turn now.

Kauffman's explanation of this idea hinges on the notion of the *adjacent possible*. The adjacent possible in a complex system consists of those states that are not members of the actual system but are one reaction step away from the actual. Once a new state has been achieved in the system by realizing one member of the current adjacent possible, a new adjacent possible, accessible from the expanded actual that now includes the additional member, becomes available. Thus, the adjacent possible is indefinitely expandable, but each stage has a definite framework within which new novelties may appear (Kauffman 2000, 142).

Kauffman qualifies the difference between the adjacent possible in classical physics and his use of it in describing biospheres. In the former case, for example in the case of a jar of atoms, all states in the adjacent possible can easily be described in principle. However, in the case of a biosphere, there is no finite way to pre-describe all the adjacent possible states. "We cannot say ahead of time all the possible constellations of matter, energy, process, and organization that is a kind of 'basis set' for a biosphere in the sense that the atomic chart of the elements is a finite basis set for all of chemistry" (Kauffman 2000, 131). Thus, we could never finitely pre-state the adjacent possible adaptations for any configuration space of a biosphere. As a consequence, Kauffman claims that the task of biology has changed:

Biologists tell stories. If I am right, if the biosphere is getting on with it, muddling along, exapting, creating, and destroying ways of making a living, then there is a central need to tell stories. If we cannot have all the categories that may be of relevance finitely prestated ahead of time, how else should we talk about the emergence in the biosphere or in our history—a piece of the biosphere—of new relevant categories, new functionalities, new ways of making a living? (2000, 134)

Thus, stories must take the place of, or at least supplement, the traditional form of scientific explanation, that is, subsumption under laws of causal necessity. Kauffman is putting into practice Peirce's point about the laws of nature as themselves products of evolution.

Kauffman, it seems, is not alone in this view. Neuroscientist and complexity scientist J. A. Scott Kelso implicitly agrees with this point and claims as a result that it is not useful to "talk about the laws of physics as if the workings of our minds and bodies are controlled by well known fundamental laws." He contends that with the emergence of new levels of complexity "entirely new properties appear, the understanding of which will require new concepts and methods" (Kelso 1999, 24). In self-organizing complex systems, he explains, novel content emerges from the "systemic tendency of open, nonequilibrium systems to form patterns," and he concludes that "intelligent behavior may arise without intelligent agents—a priori programs and reference levels—that act intelligently" (1999, 34).

From Kelso and Kauffman, we see that the laws of nature cannot be understood as universally mechanistic, and yet there is still a possibility and a need for some sort of lawlike explanation to occupy the place once held by mechanistic laws.

Getting back to Peirce, he uses the term *habit* to capture much of what these scientists are describing as self-organization. Where Kauffman and Kelso might discuss the "laws of self-organization," Peirce discusses the "law of habit." For Peirce, the universe is an evolutionary development in which habits successively emerge. The term *habit* here denotes regularities or patterns not simply in nature but already in conceptual form; it is thus an idealist term, as I explain further below. In any case, Peirce claims that everything is part of an ongoing process and can be explained as the outgrowth of an earlier stage. This all happens according to the laws of evolution, but, of course, even these laws are habits that have been forged (or self-organized) within the process. Peirce suggests what Kauffman, Kelso, and others are rendering concrete: a system of laws to supplement the evolutionary process. In rejecting deterministic physical laws, Peirce instead opts for the idealist position according to which matter is "effete mind, inveterate habits becoming physical laws" ([1891] 1974, 6:20). He goes on to argue for objective idealism. Elsewhere he writes, "My philosophy resuscitates Hegel, though in a strange costume" ([1903] 1974, 1:18). Peirce's idealism of habit as already conceptual (rather than merely non-conceptual givenness in nature) suggests that the patterns of nature are somehow the result of an agency in nature or some sort of "effete mind."

It may seem that we have here an opening for an ontotheology of some sort. However, before we get carried away with the idealist notion of effete mind or an agency in nature and begin thinking of a reenchanted nature or making comparisons to Hegel's occasional flirtation with the understanding of nature as implicit, or "sleeping," spirit, we should consider the following. Hegel also sometimes calls nature "spiritless." More important, spirit, or *Geist*, is not simply a product of nature even if it is also not non-natural or immaterial. That point would take considerable time to unpack, but let me quote two passages here. First, Hegel states, "Spirit is usually spoken of as subject, as doing something. . . ." Second, he claims to the contrary that "it is of the very nature of spirit to be this absolute liveliness, this process, to proceed forth from naturality, immediacy, to sublate, to quit its naturality, and to come to itself, and to free itself, it being itself only as it comes to itself as such a product of itself" (Hegel 1978, 6–7). A lot is being said in this passage, and much of it is rather mysterious. Spirit "proceed[s] forth from naturality" and yet is "a product of itself." The first claim underscores the metaphysical monism in Hegel and Peirce, while the latter registers an organizational duality of nature and spirit such that the reality of spirit cannot be disregarded without returning us to the problems of mechanism that Peirce teaches us to avoid.

Hegel and Peirce are attempting to hold together a non-Cartesian account of subjectivity (an account of purposive behavior and conceptual content that does not posit a substance dualism of mind and body) without letting subjectivity dissolve into the purposeless, mechanistic laws of nature. Two distinct tasks are present here. First, the non-Cartesian account attempts to show that spirit "proceed[s] forth from naturality" instead of being posited as utterly independent of nature (a result that has caused much conceptual frustration in philosophy of mind ever since Descartes' fateful dreams that led him to separate mind from body). Second, the refusal to let subjectivity dissolve into nature seems possible only if spirit is a "product of itself" and thus autonomous rather than wholly determined by natural conditions beyond it. If these tasks seem desirable, Kauffman's notion of self-organization promises some help. To explore whether and how this may be so, I offer two alternative readings of this Hegelian project, those of John McDowell and Robert Brandom.

Kauffman suggests that biologists must tell stories now. Philosophers of mind are offering narratives, too, to explain how spirit or mind can "proceed forth from nature." Such stories can take evolutionary theory to be sufficient, as is the case with Daniel Dennett, for example. However, for philosophers of the post-Kantian type, the key is to state how the human spirit eventually can free itself from a self-understanding wholly tied to nature (yet not dualistically opposed to nature in the Cartesian sense). For philosopher McDowell, the discussion follows this path, but not all the way to the end.[2] Instead of leaving nature behind altogether, McDowell's analysis of the problem terminates in what he calls "second nature." For McDowell (and Peirce, as well as Kauffman, would agree), the root of the problem is our inveterate conception of intelligibility, understanding, and explanation as tied to subsumption under deterministic causal law. McDowell argues that this conception of nature as the realm of law is too restricted. It makes the development of what Wilfrid Sellars calls "the space of reasons" seem, prima facie, impossible. How could the natural beings that we are come to act as purposive and reason-giving agents, as we do? According to McDowell, this is really the Kantian problem of finding a way to fit together our receptivity with spontaneity and so see the coordination of sensibility and understanding. Does the fact that we exist in nature render our spontaneous expressions of freedom illusory, or do our expressions of freedom indicate a nonnatural aspect of human existence?

McDowell claims that this starting point of viewing nature as the realm of law forces us to oscillate between two undesirable positions: what he terms "bald naturalism" and "subjectivism" (or "frictionless coherentism"). If our receptivity becomes controlling and the world simply determines what we can say about it, our agency is reduced to differential responsiveness to external stimuli—all subsumed under the realm of law. This is a thermostat or "Coke machine" sort of agency rather than full-fledged spon-

taneity. In such a case, the immediacy of our sensibility can only play a causal role in our claims rather than justifications. To reference Sellars again, the "Myth of the Given" yields mere exculpations rather than reasons. That is the upshot of bald naturalism—"to domesticate conceptual capacities within nature conceived as the realm of law" (McDowell 1996, 73). However, if we abandon the notion of "world-directed" normative constraints, we may end up with a coherent conceptual scheme spinning in the void, unanchored by the way the world is—in Hegelian terms, autonomous spirit being "the product of itself."

McDowell's solution to this problem is less a solution than an exorcism, a diagnosis that rids us of an unhealthy conception. If we can cure ourselves of the limited conception of nature as the realm of mechanistic causation, we may begin to recognize something like what Peirce was calling the law of habit. For McDowell, we must recognize and make use of Aristotle's notion of "second nature," that is, the socialized development of practical wisdom. Instead of needing to appeal to some nonnatural property or capacity as the source of conceptual capacities, as the Cartesian dualist does, McDowell offers a "reminder" of the "partially re-enchanted" nature we live in, whereby our sensory contact with the world is "already conceptual" and thus meaning-giving (McDowell 1996, Lectures III and IV). Thus, we have some overlap of the space of reasons and the realm of nature. By way of our second nature, our responsiveness to the world is always already a responsiveness to reasons. In the language of emergence theory, the emergence of second nature makes possible the emergence of what McDowell calls "objective purport"—that is, meaningful content in thought.

Leaving behind some of the details of McDowell's account of how we might exorcise our current view of nature in order to accommodate this emergence of second nature, it is enough to note that our problem—the problem of seeing spirit as proceeding forth from nature (not ontologically separate from it) and yet a product of itself (not determined by mechanistic laws of nature)—has become one of accounting for the possibility of meaningful thought (objective purport). To have meaning, a mind must be more than a differentially responsive thermostat or Coke machine, and meaningfulness of thought can be established only through purposive thought that responds not simply to mechanical causes but to reasons. By building reason into our account of nature (just as Peirce builds "agency" into nature) and so finding a way to account for objective purport, we are beginning to glimpse the possible resolution to our problem.

Brandom extends McDowell's account of objective purport, arguably going too far for McDowell. He articulates a semantic theory (a theory of objective purport or meaningful thought) based on inferential practices that themselves are established by a prior normative pragmatics. His theory turns supervenience on its head. Ordinarily, semantic theories account for

meaning by viewing mental content as representational: A thought represents a reality. Thoughts supervene on (depend on) an underlying reality, which we may call *nature* for our purposes. Thus, thought supervenes on nature. Brandom reverses this semantic theory, arguing instead that "the facts about having physical properties are taken to supervene on the facts about seeming to have such properties" (Brandom 1994, 292). Such a method of defining meaning sounds close to the phenomenalism of Bishop George Berkeley—that what is (*esse*) supervenes on, and thus depends for its existence on, what is perceived (*percipi*). In this case, the physical depends on the phenomenal. Brandom qualifies the pragmatist's commitment to this phenomenalist position by noting that semantic content is not exhaustively accounted for by the assertional uses of such "facts about seeming." He argues that we can still speak meaningfully about reality in such a way that we are not confined to statements about our perceptions, or seemings. If his argument succeeds, we can maintain the objectivity in our "objective purport" in spite of this reversal of phenomenal and physical properties. He endorses this reorientation of supervenience so that "natural facts" (along with the concomitant treatment of truth as a property of them) do not ground the discussion of them in all discursive practices. This is not simply a reversal of Galileo's distinction between primary and secondary qualities but a deeper understanding of the social constitution of both types and of that distinction itself. The very distinction between facts about physical properties and facts about seeming to have such properties is always already a conceptual matter. In Hegelian language, the distinction between nature and spirit is itself a *geistig* (spiritual and conceptual) distinction—that is, a distinction that spirit makes possible. This is Brandom's way of addressing McDowell's urge to find a "partially re-enchanted" nature, but Brandom locates the solution in spirit rather than nature. McDowell tries to open our eyes to a dimension of nature that is already conceptual and thus meaningful to us, whereas Brandom attempts to help us see our own activity in raising this problem in the beginning. There is simply no way to ask the question of the relation of nature and spirit independent of the spirit world in which such a distinction can be made. In Brandom's idiom, the world of spirit is the world of social practice.

Brandom's pragmatist approach is to treat the discursive practices of a society as primary and to treat semantic theory as the secondary task of making explicit the norms embedded in the discursive practices by drawing out the implicit inferential practices operating in those discursive practices. Thus, his approach offers a deflationary theory of truth, insofar as it denies that there is a property of truth or a relation of reference. As we have seen, representationalism has no place in Brandom's semantic theory. He also denies that there is a way to state the "semantic facts" in a formal way, independent of the way in which they are deployed in social practices.

Such normative features of linguistic practices derive from and are embedded in the proprieties of social practices, and the only way to make them explicit is for them to precipitate out of the social ones. Brandom's fundamental insight is that "semantics must answer to pragmatics" (1994, 83). His "social practices" function in the place of McDowell's "second nature" as the autonomous realm that generates and grounds meaningful thought.

Brandom therefore argues for the "ontological primacy of the social" (1983, 387–409). He follows a post-Kantian trajectory in understanding the peculiar status of the human being not in ontological but in deontological terms. Brandom contends that Hegel similarly argues for the possibility of meaning as arising from a form of sociality, namely, the participation in spirit, or *Geist*. In avoiding the use of ontological terms (traditionally construed) for understanding spirit, Brandom chooses to define *spirit* (Geist) in the Kantian idiom of deontic statuses—our social obligations to act in accordance with justifying reasons. Thus, spirit is "the emergence of [a] peculiar constellation of conceptually articulated comportments" (Brandom 2000, 33). Like McDowell's account of second nature, *spirit* names the dispositions and potentialities that can be actualized only by a process of socialization, but this process goes far beyond anything that might be explicable by reference to natural events and properties even as it involves nothing nonnatural or supernatural.

In juxtaposing McDowell and Brandom this way, we see McDowell's concern to retain our answerability to the world and Brandom's emphasis on answerability to each other. Both strive for objectivity in our "objective purport," but the constraint of the world on our space of reasons (McDowell) shifts to collective self-constraint (Brandom). For McDowell, this may raise the specter of frictionless coherentism, but Brandom's social pragmatism avoids the possibility for the bald naturalist to theorize McDowell's story of the development of second nature as a mere process of training and self-organization so that second nature finally can collapse back into first nature. McDowell does acknowledge the need for a distinction between a description of what the species does under particular circumstances, the way in which it flourishes and avoids dangers, and that which could function as reasons for an individual when facing such circumstances; the individual needs to be able to disobey the dictates of nature, for example the evolutionary process, and so fail to meet the natural tendencies. This is the burden of Kantian self-legislated autonomy. If second nature becomes an account of merely habituating certain dispositions and potentialities to respond to such situations with what practical wisdom dictates, we have not yet told a story about spirit quitting its naturality or freeing itself, much less being a product of itself. We would only have a story about the development of means-end reasoning. For Hegel (as for Kant), autonomy means that we subject ourselves to laws (or reasons) so that we can stand behind them and thereby mean them. Only by telling such a

story would we have narrated the arrival of McDowell's objective purport. While Brandom's reversal of supervenience goes a long way toward achieving this narration, the question for Brandom's social pragmatist theory is whether the precipitation out of social practices also vitiates the Hegelian account of spirit's freedom, albeit in a more subtle way, that is, one that cannot easily be coopted by the bald naturalist.

Both McDowell and Brandom offer emergence accounts of semantic content that avoid, or at least attempt to avoid, the reductionism prevalent in many applications of evolutionary theory to philosophy of mind or ethics. A broader question raised by their storytelling is whether and how the story of the emergence of second nature or Brandom's conceptually articulated comportments is aided by Kauffman's notion of self-organization or Peirce's notion of habit. It should at least be clear that their concerns are more closely aligned than might be expected. Furthermore, what ought to count as a sufficient explanation now that some story must be told in place of a more traditional (mechanistic) scientific account? This essay hopefully has suggested fertile ground for further development using these storytelling approaches along with evolutionary concepts.

NOTES

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1. For the sake of simplicity and clarity, I define *mechanistic explanation* as any account devoid of purpose or purposiveness. Furthermore, *mechanism* in this essay is effectively coextensive with *determinism*.

2. I refer principally to McDowell 1996. I also have found useful commentary on McDowell in Pippin 2005, 186–220.

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