



Synechism: the Keystone of Peirce's Metaphysics



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The Commens Encyclopedia
The Digital Encyclopedia of Peirce Studies
New Edition

Edited by Mats Bergman and João Queiroz

URL <http://www.commens.org/encyclopedia/article/esposito-joseph-synechism-keystone-peirce's-metaphysics>
Retrieved 17.01.2022
ISSN 2342-4257
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Abstract:

Synechism, as a metaphysical theory, is the view that the universe exists as a continuous whole of all of its parts, with no part being fully separate, determined or determinate, and continues to increase in complexity and connectedness through semiosis and the operation of an irreducible and ubiquitous power of relational generality to mediate and unify substrates. As a research program, synechism is a scientific maxim to seek continuities where discontinuities are thought to be permanent and to seek semiotic relations where only dyadic relations are thought to exist. Synechism and pragmatism mutually support each other: synechism provides a theoretical rationale for pragmatism, while use of the pragmatic maxim to identify conceivable consequences of experimental activity enriches the content of the theory by revealing and creating relationships.

Keywords: Synechism, Continuity, Agapasm, Atomism, Thirdness, Teleology

"Synechism" is the name, from the Greek *synechismos*, *syneches* (continuous), Charles Peirce gave to a set of related ideas:

- (1) "the doctrine that all that exists is continuous" (CP 1.172);
- (2) the rejection of atomism and the existence of ultimate elements;
- (3) the view that continuity of being is a condition for communication (CP 7.572);
- (4) the view that to exist in some respect is also to not exist in that respect (CP 7.569);
- (5) the view that "all phenomena are of one character" consisting of a mixture of freedom and constraint that tends in a teleological manner to increase the reasonableness in the universe (CP 7.570);
- (6) the view that consciousness has a bodily and social dimension, the latter originating outside the individual self (CP 7.575);
- (7) "the doctrine ... that elements of Thirdness cannot entirely be escaped" (CP7.653);
- (8) a theoretical synthesis of pragmatism and tychism (the doctrine that chance events occur);
- (9) the fallibilist view that our scientific facts are continually subject to revision;
- (10) "a purely scientific philosophy [that] may play a part in the onement of religion and Science" (CP 7.578).

Introduction

The above statements indicate that synechism is a metaphysical theory as well as a methodological principle. This is not a surprising for Peirce preferred his metaphysics to be experimental and scientific. On the metaphysical side synechism is a hypothetical description of a tightly woven universe, a universe woven not within layers of the same kind of reality but between layers in a scalar fashion. On the methodological side synechism is a maxim to look for connections and continuous strata between seemingly disconnected entities or events. The statements also reveal how synechism is the keystone in Peirce architectonic philosophy, involving the categories (Firstness, Secondness, Thirdness), pragmatism, his evolutionary theories, his fallibilism, and his scholastic realism.

The roots of Peirce's synechism go back to his youth at a time when he tried to develop a metaphysical theory of nature consisting of the orderly unfolding of triadic relations by means of a small number of recursive operations. In that system a short list of categories that may be described as *abstract unity*, *concrete plurality*, and *concrete unity* govern the unfolding of a process whereby abstract or virtual reality becomes increasingly differentiated and particularized only to become reunified so as to start the dialectic once again on a more complex level. In his youth Peirce drew his inspiration from Kant's claim that a dialectical method could derive a long list of categories from the short list of triads outlined in the *Critique of Pure Reason*. Peirce also studied carefully the philosophic works of Hegel, Sir William Hamilton, Laurens P. Hickok, Friedrich Schiller, and probably the work of Augustus and Julius Hare, *Guesses at Truth*. From Kant he was forced to think about the implications of a view of knowledge as a representation of something that could not be known; from Hamilton he became accustomed to thinking about knowledge as an inherently relational process necessarily requiring signs. In Hickok's *Rational Cosmology* (1858) he studied an evolutionary cosmology that derived concrete unity from abstract antagonistic potentialities. Schiller's *On the Aesthetic Education of Man*, which Peirce found particularly powerful and enduring throughout his life (MS 1606), described cognition as a product of conflicting impulses to define and at the same time to transcend limitation so that the desire to know is never consummated. Furthermore, cognition cannot move from sensation to inference to generalization but must pass through a condition of "mere determinability," a state Peirce called a state of "infinite determinableness" (Fisch, 1982, p. 11-12).

The Hare brothers wrote a little book available to Peirce in the family library revealing a

unified theory of science and history as a continuous process governed by the reciprocal action of I and THOU, subjectivity and an other that is both subject and object: "Hence it is only by the reciprocal action of these two ideas, the continual play and weaving of them one into the other, that a true system of philosophy can be constructed." And, of course, from Schelling and Hegel, though in the former case the influence appears to be indirect and in the latter direct but somewhat later (CP 4.2), Peirce became part of the crowded movement in the Nineteenth century to develop an all encompassing general theory of evolution. Peirce would reject the claim of Schiller that thought could only be a torch in a dungeon. Synechism was supposed to be his theory of the whole. It would gather up the various themes and subjects of his philosophic forefathers. A general theory of continuity would be necessary in order for all areas of study to be capable of unification. The theory of signs and the short-list categories would also play a central role in the process of unifying scientific knowledge.

Continuity

The heart of synechism is the doctrine of continuity. Continuity is "the very idea the mathematicians and physicists had been chiefly engaged in following out for three centuries," (CP 1.41) and "the leading conception of science." (CP 1.62) Peirce variously described it as "unbrokenness" (CP 1.163), "fluidity, the merging of part into part," (CP 1.164), where "all is fluid and every point directly partakes the being of every other." (CP 5.402n2) The mathematical conception of continuity included the notion of infinite divisibility, which Peirce called Kanticity, after Kant, and the notion of an infinite series of points approaching a limit, called Aristotelicity. (CP 6.166) A third notion, derived from Cantor, characterized continuity as perfect concatenation.(CP 6.164)¹

Peirce did not explain continuity by reference to a continuous medium like space or time. He observed: "Now if my definition of continuity involves the notion of immediate connection, and my definition of immediate connection involves the notion of time; and the notion of time involves that of continuity, I am falling into *a circulus in definiendo*." (CP 6.642) At times he argued that we have direct knowledge of continuity through immediate consciousness of our present feelings, (CP 1.167), and since those feelings must be past before we can interpret them, when we do so interpret them we must be in unmediated contact with the pasts continuously connected with the future. (CP 1.169; 4.641) Therefore, he argued, it is a sound hypothesis to believe that "time really is continuous." But he also argued that "time logically supposes a continuous range of intensity in feeling." (CP 6.132.) Unanswered in these considerations is whether time is

continuous because our feelings are continuous or whether our feelings are continuous because they endure in continuous time.²

With regards to space, Peirce denied that three-dimensional Newtonian space was objectively real, adopting a Leibnizian conception over a Newtonian one. (CP 5.530) In his third letter to Samuel Clarke Leibniz argued that space is not absolute but "an order of coexistences, as time is an order of successions." As Peirce described it, the order of space is not geometrical but dynamical and even dialectical: "Space is thus truly general; and yet it is, so to say, nothing but the way in which actual bodies conduct themselves." (CP 5.530) But Peirce also asserts that "the continuity of space so acts as to cause an object to be affected by modes of existence not its own, not as participating in them but as being opposite to them... . So again, when a force acts upon a body the effect of it is that the mean of the states of the body not actual, but indefinitely approximating to the actual, differs from its actual state. So in the action and reaction of bodies, each body is affected by the other body's motion, not as participating in it but as being opposite to it. But if you carefully note the nature of this generalized formula you will see that it is but an imperfect, somewhat particularized restatement of the principle that space presents the law of the reciprocal reactions of existents." (CP 6.84) This 'conduct' of bodies is to engage in reciprocal interaction and even to influence by opposition alone. Although Peirce speaks of space as a cause he means to say that being a continuum, it is a form of reciprocity, an expression of Thirdness, (CP 6.212) consisting of reacting individuals. Space is simply a common sense description of the interaction of individuals that are in large part what they are because of their interactions: "Would not the human race, supposing that it could survive the shock at all, be pretty sure to develop a new form of intuition in which the things that now appear near would appear far? For what is the real truth of nearness? Who is my neighbor? Is it not he with whom I intimately react? In short, the suggested explanation is that space is that form of intuition in which is presented the law of the mutual reaction of those objects whose mode of existence consists in mutually reacting." (CP 6.82) In a universe of isolated monads space would not exist.

Clearly, Peirce desired the most abstract and most encompassing definition of continuity possible. Cantor's definition was attractive because it seemed to display a set of logical instructions. Had he been interested in staying within the purview of mathematics, with its focus on the number system, he may not have needed to extend the definition. But he did so when he stated that space and time are continuous "because they embody conditions of possibility, and the possible is general, and continuity and generality are

two names for the same absence of distinction of individuals. (CP 4.172) Peirce recognized that continuity in whatever form manifested and was governed by generality: "continuity is not an affair of multiplicity simply (though nothing but an innumerable multitude can be continuous) but is an affair of arrangement also." (CP 4.121) He realized that "[t]here is no continuity of points in the sense in which continuity implies generality." (CP 5.205) and that "continuity and generality are the same thing." (CP 4.172) And finally: "Now continuity is shown by the logic of relations to be nothing but a higher type of that which we know as generality. It is relational generality." (CP 6.190)

Peirce faced a formidable problem in trying to understand the importance for metaphysics of the notion of continuity. Continuity was never a datum but a hypothesis that would less likely block the road of inquiry if employed in scientific investigation. It may very well be the case that the universe is not a unifiable system of relations, and that parts of it never have nor ever will come into contact with or influence other parts or the rest. Such a belief Peirce thought contrary to the lessons of scientific explorations in his century. Late in his life in a passage anticipating notions within fractal geometry, he continued to refine his notion of continuity:

In going over the proofs of this paper, written nearly a year ago [1907], I can announce that I have, in the interval, taken a considerable stride toward the solution of the question of continuity, having at length clearly and minutely analyzed my own conception of a *perfect continuum* as well as that of an *imperfect continuum*, that is, a continuum having *topical singularities*, or places of lower dimensionality where it is interrupted or divides... . If in an otherwise unoccupied continuum a figure of lower dimensionality be constructed __ such as an oval line on a spheroidal or anchor_ring surface __ either that figure is a part of the continuum or it is not. If it is, it is a topical singularity, and according to my concept of continuity, is a breach of continuity. If it is not, it constitutes no objection to my view that all the parts of a perfect continuum have the same dimensionality as the whole. (Strictly, all the *material*, or *actual* parts, but I cannot now take the space that minute accuracy would require, which would be many pages.) That being the case, my notion of the essential character of a perfect continuum is the absolute generality with which two rules hold good, first, that every part has parts; and second, that every sufficiently small part has the same mode of immediate connection with others as every other has. (CP 4.642)

Peirce may have been aware of another circular argument when he observed: "To be sure, the synechist cannot deny that there is an element of the inexplicable and ultimate, because it is directly forced upon him; nor does he abstain from generalizing from this experience. True generality is, in fact, nothing but a rudimentary form of true continuity. Continuity is nothing but perfect generality of a law of relationship." (CP 6.172) Thus, it is no explanation of continuity to say that it is relational generality

because whenever there is generality there must be the influence of a kind of lawful activity that connects things together. Scholastic realism was attractive because, in contrast with nominalism, it recognized this problem and tried to answer it by postulating the influence of the virtual powers of intelligible species. Peirce embraced such realism to that extent but never believed that it could substitute for hard science as an explanation of physical processes.

Another question regarding continuity that troubled Peirce was whether an abstract characterization of continuity would render our picture of the universe devoid of real singularities, reducible to a series of universal relationships, with no actual relata. This prospect was too Hegelian for Peirce, with its emphasis on a dialectic of conceptual reflection, and its denial of chance, freedom, and Secondness. (CP 6.305) To say that every part has its parts is a claim that may be construed as a claim about the inexhaustibility of nature, but it is not a claim that distinctions between matter and energy are without foundation. Peirce apparently believed that it was not contrary to the doctrine of continuity to speak of material bodies as genuine singularities, and in fact on at least one occasion argued that such singularities were even required by the doctrine of continuity. (CP 6.174) What he did not accept, however, was a view that singularities were irreducible atoms because atoms are by definition without parts.

An explanation of Peirce's notion of continuity as relational generality must be found in his theory of categories and in the evolutionary component of synechism (Burks, 1996; Esposito, 1973). It may be possible to describe a theory of relations of high generality and still not satisfy Peirce requirement for synechism. This was accomplished by Alfred Bray Kempe in his paper, "A Memoir on the Theory of Mathematical Form" where Kempe proposes a dyadic notational system as a formalization of all real and possible things and relations. Any given system, he argued, may be described by units and links. If new properties of a system are to be described that are not able to be described by the existing units and links, then new links and units could always be introduced. In this manner Kempe's system promised to be able to describe any conceivable condition of the universe:

3. Whatever may be the true nature of things and of the conceptions which we have of them (into which points we are not here concerned to inquire), in the operations of reasoning they may be dealt with as a number of separate entities or *units*.
4. These units come under consideration in a variety of garbs—as material objects, intervals of time, processes of thought, points, lines, statements, relationships, arrangements, algebraical expressions, operators, operations, &c., &c., occupy various positions, and are

otherwise circumscribed.

The units are of "endless variety," and include a material body, a quality of the body, and a statement referring to that quality. Kempe then defines a 'system' as follows: "If every component unit of a collection is distinguished from every unit which is detached from the collection, the collection will be termed a *system*." Systems are a kind of singularity with characteristics that apply uniquely to it. However, it is not necessary in Kempe's view to include a triadic relationship in the characterization, since the only logical components of the notion were a unit and link. The link between units does not have any of the characteristics of Thirdness and is a unit in its own right. This prospect troubled Peirce and caused him to lavish unmerited praise upon Kempe due to the clean and complete formalism of his system. However, his eventual objection was that the system broke down in the face of the doctrine of continuity, viz., that there may be states of the universe that are not strictly units or links, but vague in-between states that are given a false precision because we may refer to such states precisely using a discrete form of language. In fact Kempe's entire system was a form of language that defined its terms as having the power to represent but could not be said to represent anything. Therefore, Kemp's system did not have a way of characterizing our interpretation of it on its own terms. Kempe's diagrams do not represent anything; therefore, "it is not surprising that the idea of thirdness, or mediation, should be scarcely discernible when the representative character is left out of account." (CP 3.423) When Kempe refers to a process as a unit "the diagram fails to afford any formal representation of the manner in which this abstract idea is derived from the concrete ideas." (CP 3.424) In other words, Peirce was not satisfied with a system of notation that could refer to all that may be denoted, for a spot could fully refer to the entire universe; he wanted a system that was "connected with nature" (CP 3.423) and that was also linked to a process of discovery: "The difference between setting down spots in a diagram to represent recognized objects, and making new spots for the creation of logical thought, is huge," he concluded. (CP3.424) Kempe, to Peirce's satisfaction, could not refute the claim that Thirdness was an undecomposable element of the universe, and that if continuity was relational generality representational capacity must be part of that generality.

Atomism

Synechism is incompatible with atomism at least in the sense in which atoms are regarded as irreducible and without parts. Another incompatibility would be that two

atoms absolutely could not occupy the same space. They would be rigid bodies, to the extent that they were bodies, whose boundaries would mark a complete discontinuity with their surroundings. Peirce preferred to think of atoms the way his contemporaries regarded chemical compounds, as a system of components with an internal energy configuration: "Unless we are to give up the theory of energy, finite positional attractions and repulsions between molecules must be admitted. Absolute impenetrability would amount to an infinite repulsion at a certain distance. No analogy of known phenomena exists to excuse such a wanton violation of the principle of continuity as such a hypothesis is. In short, we are logically bound to adopt the Boscovichian idea that an atom is simply a distribution of component potential energy throughout space (this distribution being absolutely rigid) combined with inertia." (CP 6.242) (Boscovich, 1758)

A Boscovichian atom is a point of energy exerting a repulsive energy at approaching bodies, which is then turned into neutral and attractive force as the horizon of repulsive energy is breached. Ruggiero Giuseppe Boscovich, (1711-1787) was a Jesuit astronomer and mathematician and a precursor of the German Nature-Philosophers. He attempted to embed the laws of Newtonian physics into a simpler and more universal set of laws. Peirce appreciated the non-material and dynamic atomic model, but regarded the interaction of forces as more complex, as reflected in the differential equations that describe them: "But the equations of motion are differential equations of the second order, involving, therefore, two arbitrary constants for each moving atom or corpuscle, and there is no uniformity connected with these constants." (CP 6.101; 7.518) Forces are functions of space and time, and not of space alone, Peirce contended. Therefore, spatial configuration of two interacting bodies at any given time cannot be the basis for understanding subsequent configurations of those bodies. In the spirit of Boscovich, and of course Schelling and Hegel, Peirce wanted to reinterpret Newton's laws using dynamic and relativistic terms :

... one object being in one particular place in no way requires another object to be in any particular place. From this again it necessarily follows that each object occupies a single point of space, so that matter must consist of Boscovichian atomicules, whatever their multitude may be. On the same principle it furthermore follows that any law among the reactions must involve some other continuum than merely Space alone. Why Time should be that other continuum I shall hope to make clear when we come to consider Time. In the third place, since Space has the mode of being of a law, not that of a reacting existent, it follows that it cannot be the law that, in the absence of reaction, a particle shall adhere to its place; for that would be attributing to it an attraction for that place. Whence it follows that in so far as a particle is not acted upon by another, that which it

retains is a relation between space and time. Now it is not logically accurate to say that the law of motion prescribes that a particle, so far as it is not acted upon by forces, continues to move in a straight line, describing equal intervals in equal times. On the contrary the true statement is that straight lines are that family of lines which particles, so far as they are unacted upon, describe, and that equal spaces are such spaces as such a particle describes in equal times. (CP 6.82)

Atoms also violate the doctrine of continuity insofar as they are thought to be indestructible material beings. If they do not come into being and do not decay then they are not subject to transitional states. If they are instantaneously created or annihilated then their emergence or disappearance is discontinuous in space and time. (Belief in the annihilation of matter Peirce considered a gratuitous hypothesis. CP 5.587) A more coherent model is that of a system of forces. The being of elementary particles—atoms, singularities, atomicules, atomicities—was to interact: "We observe no life in chemical atoms. They appear to have no organs by which they could act. Nor can any action proper gain actuality, that is, a place in the world of actions, for any subject. Yet the individual atom exists, not at all in obedience to any physical law which would be violated if it never had existed, nor by virtue of any qualities whatsoever, but simply by virtue of its arbitrarily interfering with other atoms, whether in the way of attraction or repulsion. We can hardly help saying that it blindly forces a place for itself in the universe, or willfully crowds its way in." (CP 1.459)

As a result of his synechistic perspective Peirce at times sounds more like a twentieth-century physicist than a nineteenth-century one. Developments in elementary particle physics in this century have shown that the atom of John Dalton and Niels Bohr was a profound simplicity. The discover of the conversion of matter into energy and vice versa, string theory, the search for a pervasive Higgs field to account for the mass of a particle, quantum theory, the new science of developmental genomics —these are some recent theories that illuminate and modernize Peirce. Quantum theory, for example, refers to a radical discontinuity on the subatomic level, but only if the space and time of that level is supposed to be Newtonian-like. Rather there is relational generality at a more abstract level in the probabilistic equations describing such phenomena. As descriptive genomics gives way to developmental genomics it becomes critical to obtain a clear account of signaling pathways within the cell and organism that are carried out in the atomic activities of the components of macromolecules. The molecule-to-molecule mechanism may be described in terms of lesser or greater bonding capacity; for example, molecules may attach to a cellular membrane consisting of molecular-matrixes and disrupt the covalent bonds that stabilize the membrane molecule thereby changing

its linking capacity within the cell and making it a target cell. Hormones and other signaling molecules circulate throughout the body to highly specific targets in order to activate through various transduction pathways other messengers that turn on or inhibit cascades of enzymes. However, such descriptions do not reach a level of relational generality that explains what is being described, and we are left to marvel at what we do not understand even while the picture may be clearly before us. What is the required level of generality—the subatomic, the cellular, the intercellular, that of functioning organs, the organism, the ecological? Peirce suggests that there may be a relatively few general algorithms that are capable of explaining the dizzying complexity of mushy biological systems. He would contend that the capacity to represent would be a part of this synechistic algorithm. Representation is a process of creating a virtual reality, a Hegelian 'reflection', the emergence of a *Thou to an I*. It is part of every physical process, according to Peirce:

Whatever is real is the law of something less real. Stuart Mill defined matter as a permanent possibility of sensation. What is a permanent possibility but a law? Atom acts on atom, causing stress in the intervening matter. Thus force is the general fact of the states of atoms on the line. This is true of force in its widest sense, dyadism. That which corresponds to a general class of dyads is a representation of it, and the dyad is nothing but a conflux of representations. A general class of representations collected into one object is an organized thing, and the representation is that which many such things have in common. And so forth. (CP 1.487)

Atomism collapses because it does not include a way of integrating itself into a theory, for example, of how biological sub-systems may 'signal' other sub-systems and generally of how representations could co-exist with atoms.

Representability

Peirce claimed that "[a]ll communication from mind to mind is through continuity of being." (CP 7.572) With this insight "the barbaric conception of personal identity must be broadened" to include a dimension of social mind and social consciousness. Philosophy cannot start with a *cogito* or with sense impressions. It starts with a recognition that sensation is judgment; judgment is generalization, and generalization requires generality. The next step is to link generality with significance:

... all regularity affords scope for any multitude of variant particulars; so that the idea [of] continuity is an extension of the idea of regularity. Regularity implies generality; and generality is an intellectual relation essentially the same as significance, as is shown by the contention of the nominalists that all generals are names. Even if generals have a being independent of actual

thought, their being consists in their being possible objects of thought whereby particulars can be thought. Now that which brings another thing before the mind is a representation; so that generality and regularity are essentially the same as significance. Thus, continuity, regularity, and significance are essentially the same idea with merely subsidiary differences. (CP 7.535)

The notion that human minds are not necessary for the creation of representations is an idea Peirce embraced his entire life (Esposito, 1997-1999) His theory of signs, which stands on its own, and not upon psychology, rests upon that view. His theory of categories was formulated to account for this remarkable feature of our universe. When Peirce claimed that triads could not be constructed out of monads and dyads, unless of course a triadic system or mind does the constructing according to a triadic plan, this was an argument for the sui generis of representability. Semiosis is a process that requires the cooperation of three subjects, a representamen, its object, and its interpretant. (CP 5.484) A sign is a representamen "of which some interpretant is a cognition of a mind." (CP 2.242) However, some representama do not require human minds as we know them in order to achieve semiosis or carry signals. As we learn more, for example, about developmental genomics we should expect according to the hypothesis of synechism to be able to identify biological processes of duplication and repair that look as close to true signaling as are our intuitions about human communication.

The big picture afforded by synechism is an answer to the question of how the universe could have developed such that signs are possible within it. The answer is a transcendental argument: Without a universe capable of expressing relational generality, signs would not exist. But signs do exist, and therefore relational generality is a character of our universe. This is a variation of the Anthropic Cosmological Principle which attempts to explain the emergence of certain cosmic properties as conditions for the emergence of biological systems capable of being scientists (Barrow & Tipler, 1986). The nominalist would claim that the argument fails if signs do not exist, and that what we think are signs are just responses to stimuli and epiphenomena. Peirce had little patience with such an argument, which in reality reflected a kind of general scepticism that was compatible with any configuration of the universe, and even seems to be self refuting. For example, he believed that a sign could not function as such without an interpretant interpreting it: "A symbol is a sign which would lose the character which renders it a sign if there were no interpretant. Such is any utterance of speech which signifies what it does only by virtue of its being understood to have that signification"; (CP 2.304)and: The symbol or general sign ... is something which is a sign solely by

virtue of the character imparted to it in the interpretant, that is, it is a sign, not because it has any real connection with its object, or because it resembles it but simply because it may be understood to be a sign." (MS 307) So what does the nominalist do but interpret sensations as 'sense data' and 'sense impressions' and interpret putative signs as noises followed by behavior.³ In his paper, "The Law of the Mind," Peirce wrote:

When an idea is conveyed from one mind to another, it is by forms of combination of the diverse elements of nature, say by some curious symmetry, or by some union of a tender color with a refined odor. To such forms the law of mechanical energy has no application. If they are eternal, it is in the spirit they embody; and their origin cannot be accounted for by any mechanical necessity. They are embodied ideas; and so only can they convey ideas. Precisely how primary sensations, as colors and tones, are excited, we cannot tell, in the present state of psychology. But in our ignorance, I think that we are at liberty to suppose that they arise in essentially the same manner as the other feelings, called secondary. As far as sight and hearing are in question, we know that they are only excited by vibrations of inconceivable complexity; and the chemical senses are probably not more simple. Even the least psychical of peripheral sensations, that of pressure, has in its excitation conditions which, though apparently simple, are seen to be complicated enough when we consider the molecules and their attractions. The principle with which I set out requires me to maintain that these feelings are communicated to the nerves by continuity, so that there must be something like them in the excitants themselves. If this seems extravagant, it is to be remembered that it is the sole possible way of reaching any explanation of sensation, which otherwise must be pronounced a general fact, absolutely inexplicable and ultimate. (CP 6.158)

In contrast with mechanical causation which is dyadic Peirce describes semiotic causation as a "tri-relative influence" (CP 5.484) between sign, object, and interpretant. This influence is inherently triadic and therefore irreducible. The world does not begin with objects, and then some objects take on sign-like qualities until they become quasi-interpreted by other objects which through practice become full-blown interpreters. Rather, if signs emerge it is only because the conditions of interpretation also emerge along with them. To explain this process Peirce used concepts like quasi-mind (CP 4.550f, MS 292), dual/dialogical/dyadic consciousness (CP 4.553), and the notion of percussivity (CP 8.370, MS 293) which describes a condition of proto consciousness as a kind of vibration that acts and is at once acted upon by its action causing a kind of echo. Peirce also explained semiosis in terms of a community of interpretation, which in its most advanced form exists in scientific communities.

Excluded Middle

Peirce understood the laws of excluded middle ('everything is either A or not-A' or 'what

is not not-A is A') and contradiction (A is not not-A) or 'what is, at once, A and not_A is nothing'). (CP 2.594, 2.597) He used them frequently in his logical and mathematical studies. But he also argued that "[t]he principle of excluded middle only applies to an individual." (CP 6.168) And by that he meant only an individual taken as a logical subject that is absolutely determinate. As soon as the individual undergoes change or is characterized as having certain *kinds* of properties the law breaks down: "But besides that character, individuality implies another, which is that the individual is determinate in regard to every possibility, or quality, either as possessing it or as not possessing it. This is the principle of excluded middle, which does not hold for anything general, because the general is partially indeterminate ... " (CP 1.434) (Rosenthal, 2000)

Synechism is compatible with, and requires, the view that an object is and is not what it is if that object is part of the processes we observe in nature or mind. Furthermore, certain objects may be regarded as logical individuals or subjects of linguistic predication but when we are being natural philosophers we cannot afford to regard them as such because we run the risk of failing to recognize and ask important questions about them. Instead, they should be regarded as inexhaustible collections of systems with no a priori boundaries. In reality, our scientific methods and practices, reasoning and experimentation, reflects this recognition. Scientific ideas are works in progress, subject to continual refinement. Typically a scientific discipline begins with description and classification and then moves to theory and to process explanations, pushing deeper to discover the laws behind the shapes and qualities. In this historic progression there is a tacit recognition and acceptance of synechism. Peirce sums up this perspective:

There is a famous saying of Parmenides {esti gar einai, méden d' ouk einai}, "being is, and not_being is nothing." This sounds plausible; yet synechism flatly denies it, declaring that being is a matter of more or less, so as to merge insensibly into nothing. How this can be appears when we consider that to say that a thing is is to say that in the upshot of intellectual progress it will attain a permanent status in the realm of ideas. Now, as no experiential question can be answered with absolute certainty, so we never can have reason to think that any given idea will either become unshakably established or be forever exploded. But to say that neither of these two events will come to pass definitively is to say that the object has an imperfect and qualified existence. Surely, no reader will suppose that this principle is intended to apply only to some phenomena and not to others, __ only, for instance, to the little province of matter and not to the rest of the great empire of ideas. Nor must it be understood only of phenomena to the exclusion of their underlying substrates. Synechism certainly has no concern with any incognizable; but it will not admit a sharp sundering of phenomena from substrates. That which underlies a phenomenon and determines it, thereby is,

itself, in a measure, a phenomenon. (CP 7.569)

In his discussion of the law of excluded middle Hegel has summed up Peirce's view in his *Logic*: "The conception of Polarity, which is so dominant in physics, contains by implication the more correct definition of Opposition. But physics for its theory of the laws of thought adheres to the ordinary logic; it might therefore well be horrified in case it should ever work out the conception of Polarity, and get at the thoughts which are implied in it" (Hegel, 1975, § 119, p. 173).

Teleological Evolution

In the tightly woven universe there is no permanent disconnection between thoughts or representations and things or objects. Thoughts influence and shade into things, and vice versa. If there is a disconnect it is a local condition; the trend is always for an increase in connections to emerge. Synechism is in part a response to Kant's question of how synthetic a priori knowledge is possible. His short answer is that the philosopher's distinction in kind between the inner and outer realms of mind and nature is philosophically untenable. Cartesian analytic dualism is a static and selective description of cognition. The longer answer involves a reinterpretation of dualism in the light of "agapastic and synechistic ontology." (CP 6.590) According to Peirce, agapasm was a form of evolution, based on teleological bonding, in contrast with evolution by means of fortuitous interaction (tychasm) or mechanistic interaction (anancasm). Agagasm is evolution by creative love, the law of love, "a vital freedom which is the breath of the spirit of love." (CP 6.302; 6.305) An agapastic ontology, then, would be an ontology that allows for purposive action, action like that engendered by love which arises between persons who do not choose it, but are set in motion by it. In our mental life, agapasm is the influence of an idea that is not fully comprehended but attracts an inquisitive mind to seek out and develop it to its full expression. If all that Descartes could have known without doubt is the cogito then he could not have expressed and communicated his reasoning through the linguistic representations in his *Meditations*. That seemingly trivial fact is not beside the point for Peirce; nor was it for Kant. The expression of ideas through signs requires the continuity of mind, (CP 6.307), because the mind must work on the problems it seeks to identify and solve. Agapasm requires continuity of mind. (CP 6.307) But continuity of mind requires memory and mental states containing significations; and if so mind must obtain its objects beyond itself as narrowly understood in Cartesian nominalism. (CP 1.19) He said of Descartes: "Here is a man who utterly disbelieves and almost denies the dicta of memory. He notices an

idea, and then he thinks he exists. The ego of which he thinks is nothing but a holder together of ideas. But if memory lies there may be only one idea. If that one idea suggests a holder_together of ideas, *how* it can do so is a mystery." (CP 4.71) The mystery is solved by accepting memory and with it the continuity of mind. But mind does not exist in perpetual motion; it ceases and is disrupted. Whatever continuity it has is derived from something that it seeks to attain beyond itself as a hunger for knowing and self-expression. As an expression of an agapastic influence, the activity of mind in the universe is always greater than the sum of individual manifestations of it in human form, and would not be extinguished were human life to suddenly disappear. On the other hand, Peirce appear to say, such a complete extinction is not possible since a world which creates a species capable of science and philosophy is a world that made such knowledge an inevitability and an enduring enterprise.

Peirce's acceptance of scholastic realism— the view that ideas contain real generality, and arise through inherent power, influence, or "influx" from the real generality in nature itself—is an important component of synechism. Simple-minded empiricism tries to establish a tabula rasa upon which to place carefully identified particulars. This endeavor fails, as Peirce argued initially in his essay "On a New List of Categories" (1867), because every identification is a predication and every predication is a resort to something with universality that lies off the tabula but serves as a gatekeeper for what may be placed on it. Our inability to derive what we regard in the sophisticated philosophic standpoint as real universality from particulars and collections of particulars, and our recognition that knowledge must have as its precondition the action of some sort of generality, forces us to consider that the characteristics of our mental life may be bound together with the characteristics of reality at large.

Peirce's synechistic scenario postulates as a hypothesis a global increase in continuity and in the development of information-storage systems that allow complex processes to automatically occur in localized circumstances without recreating all of the conditions necessary to produce those processes in the first place. Here Peirce used the concept of 'habit' to refer to this process of encapsulating information. So ontogenic development is a form of phylogenic development because it contains a short-hand set of instructions that are able to summarize the results of past successes of a great many individual trials and errors that occur in a dyadic or chance manner. This comprehensive process of "becoming instinct with general ideas." (CP 5.4) is described by Peirce as follows:

The hypothesis suggested by the present writer is that all laws are results of evolution; that underlying all other laws is the only tendency which can grow by its own virtue, the tendency of all

things to take habits. Now since this same tendency is the one sole fundamental law of mind, it follows that the physical evolution works towards ends in the same way that mental action works towards ends, and thus in one aspect of the matter it would be perfectly true to say that final causation is alone primary. Yet, on the other hand, the law of habit is a simple formal law, a law of efficient causation; so that either way of regarding the matter is equally true, although the former is more fully intelligent. Meantime, if law is a result of evolution, which is a process lasting through all time, it follows that no law is absolute. That is, we must suppose that the phenomena themselves involve departures from law analogous to errors of observation. But the writer has not supposed that this phenomenon had any connection with free will. In so far as evolution follows a law, the law of habit, instead of being a movement from homogeneity to heterogeneity, is growth from difformity to uniformity. But the chance divergences from law are perpetually acting to increase the variety of the world, and are checked by a sort of natural selection and otherwise (for the writer does not think the selective principle sufficient), so that the general result may be described as "organized heterogeneity," or, better, rationalized variety. In view of the principle of continuity, the supreme guide in framing philosophical hypotheses, we must, under this theory, regard matter as mind whose habits have become fixed so as to lose the powers of forming them and losing them, while mind is to be regarded as a chemical genus of extreme complexity and instability.(CP 6.101, 5.4)

Synechism as an evolutionary theory requires not only scholastic realism, but Peirce's theory of triadic categories and its relation with his theory of signs, all together making upon an Objective Logic of the universe as an evolving totality:

But now we have to examine whether there be a doctrine of signs corresponding to Hegel's objective logic; that is to say, whether there be a life in Signs, so that _the requisite vehicle being present_ they will go through a certain order of development, and if so, whether this development be merely of such a nature that the same round of changes of form is described over and over again whatever be the matter of the thought or whether, in addition to such a repetitive order, there be also a greater life_history that every symbol furnished with a vehicle of life goes through, and what is the nature of it. (CP 2.111) (Hausman, 1993; Esposito, 1980)

Social Consciousness

Peirce connected his synechism with his belief that thoughts are not generated by individual minds, but rather that individual minds participate in social thought, not only by always emerging in a given historical linguistic framework, but also by virtue of experiencing through musement and abductive inference the extra-mental generality that operates in the universe at large and shapes our thoughts and theories. Social consciousness, manifested at times in simple feelings of sympathy for the condition of another being (CP 7.540) and at times in the complex highly formalized semiotic system

of scientific research and communication among fellow inquirers, may be explained by the principle of continuity applied to the emergence of individual minds in a universe of relational generality. "[S]ynechism," Peirce writes, "recognizes that the carnal consciousness is but a small part of the man. There is, in the second place, the social consciousness, by which a man's spirit is embodied in others, and which continues to live and breathe and have its being very much longer than superficial observers think."(CP 7.575)

Thirdness

Synechism may be regarded as Peirce's philosophy of Thirdness, the category of mediation, regularity, and coordination, as well as of "generality, infinity, continuity, diffusion, growth, and intelligence." (CP 1.340). To say that continuity is an illustration of Thirdness is to say that no continuous process could continue accidentally and without guidance. There are many instances in his writings where Peirce describes Thirdness. For example:

By the third, I mean the medium or connecting bond between the absolute first and last. The beginning is first, the end second, the middle third. The end is second, the means third. The thread of life is a third; the fate that snips it, its second. A fork in a road is a third, it supposes three ways; a straight road, considered merely as a connection between two places is second, but so far as it implies passing through intermediate places it is third. Position is first, velocity or the relation of two successive positions second, acceleration or the relation of three successive positions third. But velocity in so far as it is continuous also involves a third. Continuity represents Thirdness almost to perfection.(CP 1.337)

Every feature of synechism requires for its explanation reference to the category of Thirdness.

The Proof of Pragmatism

In his later years Peirce believed that it could be possible to give a foundation to pragmatism in order to save it from being just another theory of justification based on narrow, parochial, and unscientific grounds. Pragmatism would be an improper method of belief fixation unless such a proof was provided. Peirce also believed that to prove pragmatism, or pragmaticism to distinguish it from its relativistic cousins, "would essentially involve the establishment of the truth of synechism." (CP 5.415) Unfortunately, he never devoted a single work to the topic and if there is such a proof it must be reconstructed from various lectures notes and drafts (Fisch, 1981;

Hookway, 1985).

Synechism also was supposed to achieve a "synthesis of tychism and of pragmatism." (CP 4.584) Used in this sense synechism is a scientific theory or research program capable of explaining in a larger context why chance and experimental knowledge are not only compatible but work together to increase our knowledge of the universe. In effect, synechism explains why pragmatism is the correct method of fixing belief. The reflective pragmatist holds that

... the third category __ the category of thought, representation, triadic relation, mediation, genuine thirdness, thirdness as such __ is an essential ingredient of reality, yet does not by itself constitute reality, since this category (which in that cosmology appears as the element of habit) can have no concrete being without action, as a separate object on which to work its government, just as action cannot exist without the immediate being of feeling on which to act. The truth is that pragmatism is closely allied to the Hegelian absolute idealism, from which, however, it is sundered by its vigorous denial that the third category (which Hegel degrades to a mere stage of thinking) suffices to make the world, or is even so much as self_sufficient. Had Hegel, instead of regarding the first two stages with his smile of contempt, held on to them as independent or distinct elements of the triune Reality, pragmatists might have looked up to him as the great vindicator of their truth. (CP 5.436)

The link to Hegel is through the evolutionary and semiotic components of synechism, again, through a transcendental argument. Simply put, if continuity in nature embodying not mere contiguity but relational generality was not all-encompassing, then representability would not be achievable, and if entities called signs could not represent then experimentation would be impossible and abductive inference would always be a mere wild guess. However, it is indisputable that science advances, our knowledge deepens, and that our intuitive abductions often reveal truths once we more clearly understand the significance of the models shaping them. Thus, when the pragmatist formulates a practical experiment to test the intelligibility and truthfulness of a hypothesis, he is not defining a term by means of a physical operation, but rather puts the question to nature by asking it to reveal a universal power through the contrived set up of the experimental apparatus and testing procedures. (CP 5.424) By becoming aware of the significance of the experimental process the pragmatist extracts from synechistic metaphysics "a precious essence, which will serve to give life and light to cosmology and physics." (CP 5.423)

In 1903 Peirce gave a series of "Lectures on Pragmatism" at Harvard University. These appear to be an sketch of a proof of pragmatism. In them Peirce gave his audience an

outline of his short list of categories with emphasis on the irreducibility of Thirdness (CP 5.88), his anti-nominalism (CP 5.61) and scholastic realism (CP 5.101), an account of the way signs may represent using the categories (CP 5.71). He also explains how our scientific and normative disciplines are demarcated according to the categories (CP 5.129), and how the notion of goodness as adhering to norms of correct conduct is essential not only to ethical conduct but to the conduct of reasoning as well. With these components in place, Peirce is ready to present his proof: If pragmatism is a method of understanding which sets as its purpose the explanation of a specific phenomenon (like 'hardness') it must first survey the various ways in which knowledge develops; and when it does so, analyzing deductive, inductive, and abductive inference, a common thread emerges, viz., that all reasoning is in some form or another diagrammatic. Therefore, the normative conduct of a 'good' scientific researcher, of a good pragmatist, is to study the problem at hand in such a manner, and with the use of all of the tools made available through sound synechistic metaphysics, in order to create a concrete organized unity—whether a physical apparatus or virtual arrangement of signs on paper in the familiar form of logic and mathematics, or in the less familiar form of Existential Graphs with their high degree of diagrammaticity—in order to perform operations that will reveal a general power of nature, and will allow relational generality to reveal itself through the phenomena under investigation. In this process perception plays a critical role, not as a window through which data flows, but as a direct source of knowledge of that generality. (CP 5.150-157)

The practical proof of pragmatism, then, is that science achieves results when the scientist thinks like a Peircean pragmatist—a pragmaticist—following the maxims of synechism and striving to creatively diagram an experiment that will reveal and also help explain a basic process of nature. Pragmatism as a theory of knowing also meets its own practical test. When it is practiced our knowledge increases. If the hypothesis of synechism as a theory of the universe is true (including semiosis and agapasm), and if pragmatism is a proper abductive method of revealing piecemeal truths, then we would expect its practice to be rewarded by an increase in the action of signs (new scientific concepts) through the creation of new interpretants which that lead to increased knowledge, control, and community of inquiry.

Fallibilism

Synechism, as a research program, naturally leads to fallibilism according to Peirce. Although relational generality and Thirdness are elements of the universe the ways in

which they manifest themselves are always changing. The physics of today will not be the physics in the distant future, because the laws of physics are evolving along with the physical constants we insert into them. Fallibilism is a recognition of this fact. (CP 1.175) The doctrine of continuity also counsels that no proposition about physical or psychical reality may truthfully describe a fully determinate state or condition. By contrast, "[t]he ordinary scientific infallibilist ... cannot accept synechism, or the doctrine that all that exists is continuous __ because he is committed to discontinuity in regard to all those things which he fancies he has exactly ascertained, and especially in regard to that part of his knowledge which he fancies he has exactly ascertained to be certain. For where there is continuity, the exact ascertainment of real quantities is too obviously impossible." (CP 1.172)

Scientific Religion

Synechism is a purely scientific philosophy, but a philosophy that brings its scientific temper directly to bear upon religion, reshaping it and giving it a meaning that is more congenial to the modern mind. (CP 7.578) In "A Neglected Argument for the Reality of God" Peirce returns to Friedrich Schiller's notion that pure play and musement of thought and reflection are fertile sources of inspiration in our quest to comprehend our universe and our place in it. (6.458) Stripping aside the distinctions of sacred and secular we may reach a religious inspiration even in the most practical reflections about how the universe operates. But we cannot do this if we are materialists and nominalists.

Synechism gives aid and comfort to religious sentiment though not necessarily to established religion and promises to unify our scientific and religious beliefs by placing the individual in a world that is not foreign and different in kind from our human world, insofar as the Thirdness manifesting our own consciousness is akin to the Thirdness that operates everywhere, including in other persons. Synechism supports a belief in social consciousness, "by which a man's spirit is embodied in others, and which continues to live and breathe and have its being very much longer than superficial observers think," (CP 7.575), in the reality and value of sympathy, and in the possibility of attaining community with divinity. And synechism rejects the finality of death, as popularly understood, since that would create a complete discontinuity. (CP 7.574) Clearly, Peirce desired that his synechism serve the practical interests of persons who were not scientists or philosophers. But he realized that its strength remained first and foremost in its remaining primarily a scientific philosophy, which must resist becoming another religious fad or dogma in the guise of one more evolutionary theory in vogue in the

latter half of the Nineteenth Century. In 1893 he produced a Prospectus for a series of volumes of his philosophy. Volume Ten was to be entitled "The Regeneration of the Church" and its contents were described as follows:

The philosophy of continuity is peculiar in leading unequivocally to Christian sentiments. But there it stops. This metaphysics is only an appendix to physics; it has nothing positive to say in regard to religion. It does, however, lead to this, that religion can rest only on positive observed facts, and that such facts may prove a sufficient support for it. As it must rest upon positive facts, so it must itself have a positive content. A series of plays upon words will not answer for a religion. This philosophy shows that there is no philosophical objection to the positive dogmas of Christianity; but the question as to their truth lies out of its province.

The pragmatic practice of science, as enlightened by synechism, gives a significance to scientific knowledge not found in empiricism. In his review of Royce's *The World and the Individual* Peirce noted: "We can hardly believe that he is so entirely won over to the extreme pragmatism of his colleague, James, as to hold that Doing is the ultimate purpose of life. Nor is this necessary; for the purpose of an experiment is to learn, and the performance of it is only a means to that end. This internal meaning calls, then, for more and more definiteness without cessation; and the limit toward which it thus tends but never fully attains is the knowledge of an individual, in short, of God." (CP 8.115) Peirce must have believed that the scientific impulse is based not solely on fear of the future or avarice, but on curiosity and even a love of learning as well. The growth of community, communication, and evolutionary love described in synechism also gives broad and secular credence to a sentiment that is usually the province of religion:

It is not by dealing out cold justice to the circle of my ideas that I can make them grow, but by cherishing and tending them as I would the flowers in my garden. The philosophy we draw from John's gospel is that this is the way mind develops; and as for the cosmos, only so far as it yet is mind, and so has life, is it capable of further evolution. Love, recognizing germs of loveliness in the hateful, gradually warms it into life, and makes it lovely. That is the sort of evolution which every careful student of my essay "The Law of Mind" must see that synechism calls for. (CP 6.289)

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Endnotes

1. Discussions of Peirce's notion of continuity in relation to mathematics may be found in: Noble (1989), Potter & Shields (1977), Hausman (1998), Sfendoni-Mentzou (1997), Herron (1997). ↩
2. Hartshorne (1964) called Peirce's emphasis on continuity in temporal experience a serious mistake. ↩
3. The analysis of animal behavior by Ludwig Wittgenstein in his *Philosophical Investigations*, § 493 illustrates this form of nominalism. ↩