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CRITICAL EXAMINATION OF PEIRCE'S THEORY OF CATEGORIES

EXAMEN CRÍTICO DE LA TEORÍA DE LAS CATEGORÍAS DE PEIRCE

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Resumen: En este artículo se reconstruye la teoría de las categorías de Peirce y se muestra que la forma canónica de las categorías que él propone es *Primeridad*, *Segundidad*, *Terceridad*. También se discuten las categorías cosmológicas relacionadas de Tijismo, Sinequismo y Agapismo evidenciando y discutiendo algunos problemas. En particular, se discute en qué sentido se puede hablar de categorías últimas o básicas, las diferentes formas de relaciones, los diferentes tipos de causas, el principio de adquisición de hábitos, la posible evolución de las leyes y el papel de la representación en nuestra relación con la realidad.

Palabras clave: Categorías, Primeridad, Segundidad, Terceridad, Tijismo, Sinejismo, Agapismo, Causa.

Abstract: Peirce's theory of categorization is reconstructed and shown that the canonical form of the categories proposed by him are *Firstness*, *Secondness*, *Thirdness*. The related categories of Tychism, Synechism and Agapism are also discussed and shown several problems. In particular, I discuss about the sense in which we can speak of ultimate and basic cat-

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egories, the different forms of relations, the different kinds of causes, the principle of habit-forming, the possible evolution of laws, the role of representation in our dealing with reality.

Keywords: Categories, Firstness, Secondness, Thirdness, Tychism, Synechism, Agapism, Cause.

§1. Collecting a Vast Material

Peirce has dealt along his whole life with the problem of categorization. His production shows several changes and shifts but also an impressive continuity not only in the general characters of the research but also in some fundamental results. We can schematically depict five different periods. Let us first summarize his contribution and then consider some problems[1].

1.1 *First period*

A first period (going from 1861 up to 1884) precedes the formulation of the categories *Firstness*, *Secondness*, *Thirdness*. Here, he already speculated about categories, initially about the notion of IT (Peirce, 1861a). He shows already a tendency towards triadic categorization, what raises some doubts about his later statement (Peirce, 1898: 124; Peirce, 1898: 146) that he learnt about this triadic structure from Kant, since a first mention of this philosopher appears in the 1865 Harvard lectures (Peirce, 1865, *W* 1.164). We may assume that Peirce dealt intensively with Kant when preparing these lectures but that his engagement with transcendental philosophy was very embryonic before. In fact, the first categories proposed by him where "I, It, and Thou" (which do not possess a Kantian flavor and are rather influenced by romantic poets). Too little is known for making some conjectures (the manuscript is a kind of table of contents of an unwritten book). In a second short manuscript (Peirce, 1861b), he speaks of three celestial worlds, a reminiscence of which can be found in his later saying

[1] I am very thankful to Dr. J. Santiago Pons Doménech for his careful reading of the text and the many suggestions.

about the law (of mind) that is "the celestial and living harmony" (Peirce, 1892b, *W* 8.154): they are the manifold of sense, the world of consciousness, the world of abstraction. The first notion can be mapped to that of "It" while the second to that of "I". However, it is difficult to find a connection between the world of abstraction and whatever of the former three categories. Nevertheless, there is also some connection since at the end of these brief notes it is said that "time becomes space by conjunction with a heavenly world", "that of consciousness. And this turns the IT to THOU". It may be noted that this second triad seems somehow connected with an act of faith, what reinforces the conjecture that Peirce's original reflection on categories was not so Kantian.

Apparently, the influence of Kant is clearer when he came later on these issues in his 1866 Lowell lectures (already anticipated in a kind of preparation manuscript of 1865). in particular in the ninth one. Here, it is formulated again a triadic articulation of categories that will remain plus or minus stable across the years and that is even somehow acknowledged later on (*Cfr.* Peirce, 1898: 150): he speaks about a reference to a Ground, reference to a Correlate, and reference to an Interpretant. Peirce tells us here (Peirce, *W* 1.473-75) that *reference to a ground* is Quality, which means "the pure form or abstraction which is the original of the thing and of which the concrete thing is only the incarnation" (thus, we find here somehow the world of abstraction); if we ask about the occasion upon which the conception of quality was introduced, we find that was when "generalization and contrast takes place, that is when things are put into comparison" (what bears a connection with the manifold of senses). and this makes the *reference to a correlate*; if we finally ask about the occasion upon which reference to a correlate was introduced, it appears that "it is the *reference of things to a mediating representation or interpretant*"[2]. While relation is of two kinds (equiparance and disquiparance). there are three kinds of representation: likeness (what is called icon later on). indication or correspondence to a fact (index). and symbol (see also Peirce, *W* 2.56). In the same lecture (Peirce, *W* 1.485) these three aspects are connected with hypothesis, induction and deduction, respectively. We see here the very first idea of semiotics that takes its origins from the issue of categorization. Vice versa, it may be noted that the representational view of semiotics

[2] My italics: this has a connection with the world of consciousness.

strongly influences (and will influence) his work on categorization. About the latter, we can easily find in the three kinds of reference discussed in these lectures the basic features of the later categories.

These ideas are extensively developed in the 1868 published paper "On a New List of Categories" (Peirce, 1868b). Here it is said that the word IT stands for substance or "what is present in general", while being denotes simply "an indefinite determinability of the predicate". "Substance is inapplicable to a predicate, and being is equally so to a subject" (Peirce, *W* 2.49-50). Now, expressing more clearly hints already present in the Lowell lectures, Peirce says that the three references are kinds of "intermediate between the manifold of the substance and the unity of being" (where it is likely that there is a connection with the previous world of abstraction). "The conception of being is to unite the quality to the substance" (Peirce, *W* 2.51-52). In the Lowell lectures (Peirce, *W* 1.473). Peirce had introduced the notions of dissociation (when we think of an object without thinking to the other at the same time). abstraction or prescission (when we suppose an object to be without the other). and discrimination (when we recognize that the two things are not the same). Now (Peirce, *W* 2.53-54). he tells us that "reference to a ground cannot be prescinded from being, but being can be prescinded from it"; "reference to a correlate cannot be prescinded from reference to a ground; but reference to a ground may be prescinded from reference to a correlate"; "reference to an interpretant cannot be prescinded from reference to a correlate; but the latter can be prescinded from the former". In the same paper (Peirce, *W* 2.55) he calls for the first time the interpretant a third. Summarizing, it is clear that Peirce dealt with these basic notions in terms of possible references or also possible relations (monadic, dyadic, triadic). establishing in this way a hierarchy among categories, from the more basic one (the first) to the more complex one (the latter). a feature that will remain a constant across his whole intellectual production.

Between 1865 and 1871 Peirce was mainly interested in logic, categories and semiotics. Thereafter, he dealt much more with the problem of reality and in what is likely the first manuscript on that subject (Peirce, 1872-1873, *W* 3.28-32) he formulated also his idea of pragmatism: from 1872 onwards we have the formulation of pragmatism essentially connected to belief and inference, so that reality becomes convergence of belief in our intercourse with objects. In this period (Peirce, 1872-1873, *W* 3.63) in continuity with his early representation-

al understanding of semiotics, he develops also the idea that "an idea is in the strictest sense a representation", and in this way he believed to solve the problem of reference (Peirce, *W* 3.64): "There must be connected with any representation of an object another representation which represents that object independently & there must be a representation that the one represents whatever the other represents". I mention that first hints of this approach can already be found in 1865 (Peirce, *W* 1.322 ff.).

1.2 *Second period*

Peirce seems to have come back to the issue of categorization only in 1885 (starting the second period of his thinking on this subject). when, after an intensive and productive work on logic, he writes the "Notes on the Categories" (Peirce, 1885a). After a reference to Kant's list of categories, which are "no longer believed in" (Peirce, *W* 5. 235) and having said that there is a triadic structure in all Kantian formal logic, he introduces them as First, Second Third, and adds the idea (Peirce, *W* 5.236-37) that "three conceptions are really essential in formal logic; so that they are three fundamental categories of thought". This is in agreement with the previous connections of categorization with a theory of relations since Peirce has always considered the latter a logical issue (see e.g. Peirce, 1898, third lecture). However, Peirce seems to think here also about a general ontological sense of the categories, since he speaks of three faculties of the mind, three functions of the nerves, and three elementary constituents of the physical universe, so that they seem to have a ground in the physical or rather metaphysical constitution of our universe, what goes certainly much further than a Kantian approach to categorization. This will also remain a constant in his work. The category of the First is presented as something unrelated to whatever "in itself; something without genesis, flourishing in spontaneous and pristine freedom". It is worth stressing that Peirce's evaluation of a fundamental aspect of freedom and chance in our universe is something really new relative to the classical thought (both in physics and philosophy) and anticipates somehow developments of the 20th century in quantum mechanics. The category of the Second is a "real relation to something, a clash, a constraint, a force, an end", while the Third is "medium; representation; synthesis (and analysis); resultant; absorption, evolu-

tion"; or also: "The Third is the medium between the first and the second, the beginning and the end. It is what actually is, while the First and the Second are merely its limits" (Peirce, *W* 5.238-39). It is important to note that Peirce never abandoned the idea that the Third is mediation between the first two categories, although later accounts of categories show some inconsistencies on this point. It is in fact worth noticing that both the Second and the Third are presented as dynamical categories. In another interesting manuscript of this period about "One, Two, Three" (Peirce, 1885b). it is evident that relations play a central role in categorization, since One expresses singular characters, Two dual characters, and Three plural characters. In fact, in the same manuscript it is shown that any kind of higher-order plurality can be reduced to a triadic relation (a preferred example of Peirce is a network of roads).

However, the formal aspects are a part of the issue, since Peirce adds that, due to their absolute generality, these categories "must be innate ideas" (Peirce, *W* 5.245). It is also remarkable that Peirce relates the three categories to consciousness, and therefore to *experience*, and in particular to (1) feeling, (2) consciousness of an interruption or sense of resistance, and (3) synthetic consciousness binding time together (Peirce, *W* 5. 246). It is then not surprising that later, in a manuscript (1886a) that could be considered a kind of first *Guess at the Riddle*, he speaks explicitly of Kantian categories. However, as mentioned, there is here a kind of tension between the ontological widening of the categories and their presumed Kantian character, whether of logical or experiential kind. In the quoted manuscript of 1885, he introduces the idea that physical constants (and so also laws of nature) could have undergone some kind of evolution, so that the universe is "progressing from a state of all but pure chance to a state of all but complete determination by law (Peirce, *W* 5.293). It is thus not surprising that in this manuscript he also speaks of an Evolutionist speculation. Nevertheless, the state of complete determination by law appears to be not fully in agreement with the idea that Secondness, which, also according to later contributions, should represent the final stage of the universe but also expresses clash and reaction. I think that the source of the problem is in the mentioned fact of having assigned dynamical character to both Secondness and Thirdness.

One year after he starts to write what is up to now one of the most complete accounts of what can be called Peirce's canonical categories: *Guess at the Riddle* (1887-1888). At the start (Peirce, *W* 6.168) he says:

> The undertaking which this volume inaugurates is to make a philosophy like that of Aristotle, that is to say, to outline a theory so comprehensive that, for a long time to come, the entire work of human reason, in philosophy of every school and kind, in mathematics, in psychology, in physical science, in history, in sociology, and in whatever other department there may be, shall appear as the filling up of its details.

It is again evident that the project goes again much further than being a theory of experience or a logical examination. The First expresses ultimate facts that are "not capable of explanation" (Peirce, *W* 6.205-206), so that "conformity to law exists only within a limited range of events" and "is not perfect" (Peirce, *W* 6.207). The dynamical character of the Third is formulated more explicitly than before: "Between the beginning as first, and the end as last, comes the process which leads from first to last" (Peirce, *W* 6.173). I also recall that God is understood here as the First as Creator and the Absolute Second as completely revealed, while "every state of the universe at a measurable point of time is the third" (Peirce, *W* 6.173-74). Also in the related manuscript titled "Thrichotomic" (1888) he says that genuine Secondness is of dynamical kind (Peirce, *W* 6.211) but tells again that Thirdness is a process (Peirce, *W* 6.214). Since the primordial state of matter is conceived (following H. Spencer) as homogeneity, then it is added that variety (which should be the First) is only potential (Peirce, *W* 6.181). In a previous manuscript on "Design and Chance" (Peirce, 1883-1884, *W* 4.550), it is said that "chance must act to move things in the long run from a state of homogeneity to a state of heterogeneity". In the section Psychology of *Guess at the Riddle* (Peirce, *W* 6:184) there is the first idea of evanescent feelings (recurrent also in the *Law of Mind*), and the idea of evolution as habit-forming is already formulated (Peirce, W6.190; *W* 6.208-209). In the same manuscript on "Design and Chance", habit is defined as "the tendency to repeat any action which has been performed before" (Peirce, 1883-1884, *W* 4.553). Then, evolution is again considered as a process from chance to law (Peirce, *W* 6.199-202). I also note that the three basic elements of evolution (which later on were in fact integrated in biological evolution theory: *Cfr.* (Auletta, 2011a: Sec. 9.11)) are defined (Peirce, *W* 6.202): individual variation, elimination of unfavorable characters (i.e. selection). hereditary transmission, where it is likely not a chance that the second and the third steps are exchanged.

1.3 *Third period*

The third period starts in 1891 with a series of papers published in *The Monist*. Here, the categories take a more decided evolutionary turn. In fact, already in a manuscript of 1890 (Peirce, 1890a, *W* 8.19-22) he introduces the triad chance-law-continuity as well as the canonical trichotomy first-second-third. In the first paper of the series, "The Architecture of Theories", he stresses again that laws come from evolution out of chance (Peirce, *W* 8.101). This implies that laws (and "uniformity in general") demand rational justification (see also (Peirce, 1883-1884, *W* 4.547)). This can be true for laws, at least to a certain extent, however it is certainly not true for symmetries (which ground all kinds of uniformities). In other words, current scientific developments show that not every kind of order is the result of evolution and not every kind of order demands rational justification. Here, Peirce, although a revolutionary thinker, is still influenced by the classical view of science that considers dynamical factors and causal explanations as primary (in fact laws and causal explanations coincided in that framework). Moreover, that approach conceives relations present in our real world as dynamical only, as it is evident by Einstein's later contribution[3].

As a consequence, in all of these papers the main idea is that habit-taking, first presented as characteristic of mental evolution (Peirce, *W* 8.105-106). is a primordial principle of the universe (Peirce, *W* 8.179): as Peirce says, it is a kind of "objective idealism" on the outline of Schelling: "matter is not completely dead, but it is merely mind hide-bound with habits" (Peirce, *W* 8.155), what to a certain extent could even be considered as an incongruence: if habit-forming or habit-taking (depending on whether we stress the objective or subjective dimension) rules the evolution from chance to the mental dimension of rationality, how it is possible that "stupid" matter is a conglomerate of habits? Or at least, which additional reason makes that matter does not progress towards a mind-like dimension? Moreover, what appears astonishing is that Peirce vindicates the Darwinian framework of evolution (in fact, the general mechanism of chance-selection-transmission, although again in bad order, is presented) but he correctly points out that evolution by habit-taking is *Lamarckian* and not Dar-

[3] On this stuff see Auletta, & Wang (2014: c. 10). I shall come back to this problem in the next section.

winian (Peirce, *W* 8.102; *W* 8.192-93) or also Schelling-like (Schelling is explicitly mentioned in Peirce (*W* 8.135). It is worth noticing that a similar problem emerges in the second paper (Peirce, 1892a) about the problem of ampliative inferences (induction and abduction but also some forms of deduction). In fact, it is said (Peirce, *W* 8.114-15) that any inference of this kind "involves no postulate whatever" as far as it converges spontaneously towards truth. However, in the influential papers written in 1868-1869, and in particular in 1868c, he stressed that the progress of knowledge comes from error correction and therefore from the reformulation or even dropping of previous assumptions (Peirce, *W* 2.239). I am not sure that Peirce now considers this point to be still a heritage of his early nominalism from which he will now take the distance (Peirce, *W* 8.136), what I would find inexact. Likely not, since in a later contribution (Peirce, 1898: 165) he reaffirms the view that the progress of knowledge corrects previous premises, and so also previous *assumptions*. So, it is difficult to conceive knowledge and its progress without postulating something.

Coming back to his first paper of the series, he proposes also here the canonical triad (Peirce, *W* 8.109). What is interesting is that he affirms that the third is mediator between first and second but, as in the 1886 manuscript on "One, Two, Three", adds that the future is such that "the world becomes an absolutely perfect, rational, and symmetrical system" (Peirce, *W* 8.110), what, as mentioned, appears to be in conflict with the idea that Secondness be an issue of resistance and brute force. In other words, how to conceive Secondness as the world of brute facts if at the same time is the final realization of a rational order? Or we need to renounce the idea that Thirdness is a dynamical mediation between the other two categories bringing from Firstness to Secondness? I again remark that having conceived both Secondness and Thirdness as dynamical may have generated some inconsistencies.

In the paper on "The Law of Mind" (Peirce, 1892b; Peirce, 1893b) Peirce introduced two new evolutionary categories: tychism (chance) and synechism (continuity). the latter showing some connections with his early world of abstraction. Although the first concept agrees well with Firstness, for the reasons mentioned continuity does not fit with Secondness, nor with Thirdness: the problem of the first identification is due to the inner conflict in the category of Secondness, since, on the one hand he had previously spoken of Secondness being the rational destiny of the universe, which would fit with the notion of conti-

nuity; but, on the other hand, he has always intended it as ruling the conflicts of the physical world. The problem with the identification between synechsim and Thirdness is that the former has an ideal or pure rational content, while the latter should possess a dynamical character. This is also the reason why, in those years, he tends to identify Law with Secondness (Pons, 2013: 111-13). He first presents continuity as connected with an associationist theory of the mind, according to which "ideas tend to spread continuously and to affect certain others" by loosing their intensity so that "the present is connected with the past by a series of infinitesimal steps" (Peirce, *W* 8.136-37). Then, according to the conception of evolution from Peirce, chance to law and rationality, Peirce says that feelings (the primary element of the mental life) "become welded together in association" so that "the result is a general idea" (Peirce, *W* 8.149; Peirce, 1898: 236-37). In this new dynamical view, time is considered in Aristotelian terms so that "the present is half past and half to come" (Peirce, *W* 8.146). and "the future is suggested by, or rather is influenced by the suggestions of, the past" (Peirce, *W* 8.150)[4].

The third new notion, Agapism or agapasm, was introduced in the paper on Evolutionary Love (Peirce, 1893a). The justification for formulating this principle is the necessity to introduce a "propulsion" since "habit is mere inertia" (Peirce, *W* 8.192). Thus, agapistic evolution or evolution by love, in contrast with both evolution by chance and evolution by necessity, becomes the "energetic projaculation" of the universe (Peirce, *W* 8.194). As a consequence, the "agapastic development of thought" is "distinguished by its purposive character" (Peirce, *W* 8.203). In this context, I recall that he affirms that "it is the instincts, the sentiments, that make the substance of the soul. Cognition is only its surface, its locus of contact with what is external to it" (Peirce, 1898: 110). This seems, however, to go much further than the development of thought. In fact, elsewhere (Peirce, 1902, *EP* 2.121-24) he affirms that ideas "have a power of finding or creating their vehicles, and having found them, of conferring upon them the ability to transform the face of the earth". Here, it is evident that Peirce, who from here on identifies agapism with Secondness (due the notion of effort) and synechism with Thirdness (due to the dimension of rationality and legality). thinks about the dynamical character of the latter in terms of the influence that ideas can have on the world (it is a stron-

[4] These are important ideas that I have shown to be also in agreement with more recent scientific developments (Auletta, 2011b: Subsec. 3.3.7).

ger turn to the realism of ideas, on which I shall come back). In the interesting manuscript on Immortality in the Light of Synechism (Peirce, 1893b) he, quoting Parmenides's dictum "being is, and not-being is nothing", adds (Peirce, *EP* 2.2).

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 to say that in the upshot of intellectual progress it will attain a permanent status in the realm of ideas.

However, this has the momentous consequence of attributing to formal realities like ideas a dynamical character, which need to be obviously of teleological kind. It seems that Peirce has forgotten Leibniz's lesson that *Ideæ non agunt* (Leibniz, 1678-1679: 150). The main problem of Peirce here is the same of the late-Middle Ages and Modern Aristotelism: the conflation of formal and final causes together (rooted in Aristotle's biological model of causation). so that there are finally only dynamical causes, which paved the way to the modern identification between the notion of efficient causation and that of causation in general (Pasnau, 2004; Auletta, 2011b: Subsecs. 3.2.5, 3.3.7). It may be not by chance that in the following Peirce avoid to use the notion of agapism, or at least I could not find consistent reference to it, although he often comes back to the notions of tychism and synechism. However, this would make the categories somehow incomplete, and this can be the reason why Peirce never abandoned the older notions of Firstness, Secondness, Thirdness.

1.4 *Fourth period*

Of these developments his fourth period, covering the years just after *The Monist*'s series of papers, is witness. Apart from some unpublished manuscripts quoted in the Robin catalogue (e.g 13 and 954-55, part. published in (Peirce, *CP* 1.141-175)) and very short fragments (Peirce, *CP* 1.300-303). I recall the short manuscript on "The Categories" (Peirce, 1893-1895). which is an examination of the three kinds of relations (proving that there are not of superior order) and of the canonical triad. Here, continuity is again associated with Thirdness. In his famous letter to W. James (Peirce, *CP* 8.249-315) he quotes both tychism and synechism although he deals again essentially with the first triad (see in particular 8.264-8.269). I also recall that in another manuscript (Peirce, 1899) he treats

the canonical triad in terms of quality-reaction-form. Far more important is the series of the 1898 Cambridge Lectures (*Reasoning and the Logic of Things*). Also here it is said that "the really continuous things, Space, and Time, and Law, are eternal" (Peirce, 1898: 115), so that "the whole universe of true and real possibilities forms a continuum, upon which this Universe of Actual Existence is, by virtue of the essential Secondness of Existence, a discontinuous mark" (Peirce, 1898: 162; see also Peirce 1898: 189-190, where it is said that "continuity is Thirdness in its full entelechy"; 1898: 261). This distinction seems to me to be crucial: it is a pity that Peirce did not maintain it so clearly in his subsequent production. In fact, it is worth noticing that the dynamical view of the evolution from chance towards rationality become for Peirce the way in which nature syllogizes: in particular, "Nature also makes inductions and retroductions", so that "Evolution wherever it takes place is one vast succession of generalizations" (Peirce, 1898: 161; 1898: 197-98). Precisely because of that distinction, I had preferred that Peirce had spoken here of *analogues* of inferential processes. Although Peirce avoids here the term agapism he stresses that mental habits cannot be built without a certain effort (Peirce, 1898: 191). In these lectures there is also an important correction of previous views: here, it is in fact said that no random interactions among molecules could produce whatever effect without some kind of regularity (Peirce, 1898: 210-11). what shows that evolution cannot happen by chance alone: "uniformity, or necessary law, can only spring from another law; while fortuitous distribution can only spring from another fortuitous distribution. Law begets law; and chance begets chance". However, Peirce still affirms that "laws of nature are results of an evolutionary process" (Peirce, 1898: 240-41)[5]. The notions of tychism and synechism are recalled (Peirce, 1898: 260-61) but there is no word in the whole book about agapism.

1.5 *Fifth period*

We can likely distinguish a fifth period covering the later production, starting in the years 1902-1903, where he became again very active on this issue in the oc-

[5] I shall come back to this issue in the next section.

casion of two important series of lectures: this period is characterized by a stronger realism about categories, which brings him to distinguish between *reality* that can be attributed also to categories and *existence*, which is a prerogative of individuals (Pons, 2013: 119-25). In particular, I make reference here to the 1903 Harvard lectures. Here (Peirce, *EP* 2.149-53). the triad consisting in presentness, struggle, nous or intelligibility is presented. In the third lecture ("The Categories Defended") he comes back to the canonical formulation recalling the connection with index-icon-symbol (Peirce, *EP* 2.160-64). and again stresses the third as medium. The same concepts are essentially discussed in the third ("The Seven Systems of Metaphysics") and seventh ("Pragmatism as the Logic of Abduction") lecture. In the manuscript on "Sundry Logical Conceptions" (Peirce, 1903b). Thirdness is again understood as habit-forming. The issue of the final state of the universe as entelechy is expressed in the manuscript on "New Elements", where it is said:

> The entelechy of the Universe of being, then, the Universe *qua* fact, will be that Universe in its aspect as a sign, the 'Truth' of being. The 'Truth', the fact that is not abstracted but complete, is the ultimate interpretant of every sign (Peirce, 1904, *EP* 2.304).

The problem is that it seems to be there a confusion between habit-forming, which according to previous views should be the proper mode or process of evolution, and its final state. If Thirdness becomes such a final state, how it can be the mediator of the whole process? In fact, Peirce himself had correctly distinguished between Aristotle's notions of *energheia* (as a process or power) and *entelechia* (as final state) (Peirce, 1886b, *W* 5.404; 1906b, *EP* 2.373-74). In the same 1904 manuscript he says (*EP* 2.304-305):

> Of the two great tasks of humanity, *Theory* and *Practice*, the former sets out from a sign of a real object with which it is *acquainted*, passing from this, as its *matter*, to successive interpretants embodying more and more fully its *form*, wishing ultimately to reach a direct *perception* of the entelechy; while the latter, setting out from a sign signifying a character of which it *has an idea*, passes from this, as its *form*, to successive interpretants realizing more and more precisely its *matter*, hoping ultimately to be able to make a direct *effort*, producing the entelechy. But of these two movements, logic very properly prefers to take that of Theory as the primary one.

The two aspects are clearly distinguished, and it seems to me to be obvious that the *physical* world (that is, our universe) follows the latter and not the former. It is remarkable that in the later manuscript on "The Basis of Pragmaticism in Phaneroscopy" (Peirce, 1906a: 364-65) he again comes back to the proof that there can be no relations of order higher than three that are not decomposable in relations of lower degree.

§2. Critical Examination

2.1 *Are there three ultimate categories?*

The first problem to be examined is the issue of the nature and extent of Peirce's theory of categories. Apart from juvenile drafts, it is evident that the first ripe manifestations of his thought (in the second half of the 1860s) have essentially two roots: logic and theory of experience, two problems that are not completely unrelated since they are doubly connected through the forms of inference and semiotics. From a logical point of view, he correctly points out that relations are essentially of three orders: monadic, dyadic, triadic. I shall come back on the way in which these relations are understood. By now, let us assume Peirce's definitions. Moreover, I consider Peirce's arguments about the reduction of higher-order relations to a combinatory of these three as exhaustive. About the problem of experience, it is difficult to deny that we can cast all kinds of intercourse with the world in three fundamental aspects or issues: feelings or primary (and in general first) experiences of things (and in particular of their qualitative manifestations). experiences of resistance, and experiences of acquaintance or habit-forming. This is evident when considering the way in which we get a new idea (in general a solution to a problem). then try to develop it against the intellectual *status quo* of our time (which is by definition conservative, as expressed in academies and magazines) and eventually succeed in spreading it once that we have succeeded in showing its fertility. This is certainly an important contribution to philosophy and we can say that Peirce has so far succeeded in taking elements coming from the idealistic tradition (essentially from Kant and Hegel). remoulding them and conferring to them a more precise and deeper status.

However, as we know, Peirce's understanding of categories goes much further, becoming the way for dealing with fundamental ontological and even metaphysical questions. Peirce knew very well that the issue was lively discussed in ancient philosophy, especially by Aristotle and his commentators. The Greek philosopher asked whether there is a universal category of being and his answer was negative, reaching the conclusion that being is framed in several (canonically ten) categories or at least in a fourfold subdivision that Porphyry summarizes as follows:

> If I had to give the minimal possible division into genera, I would divide οντα, and the significant φωναί corresponding to them, into four as follows: Beings are either substances (universal or particular) or accidents (universal or particular). Division, therefore, smaller than the fourfold is not possible[6].

Moreover, as Evangeliou points out, according to Porphyry there is not a single way to categorize the world. It is also important to consider this problem also in the context of current Category theory (Spivak, 2013). Accordingly, we can certainly build very general categories (like the category of all sets, denoted **Set**) or even the category of all categories (**CAT**). Nevertheless, these categories are articulated mathematical structures satisfying fundamental requisites: essentially, categories are collections of objects (in the general mathematical sense of the word) and of mapping among them called morphisms, which satisfy compositionality, associativity and identity law. So, it is not easily understood in which sense generalizing categories will bring us to concepts that are simultaneously of general applicability and basic from the point of view of our experience of the world. There is in fact a crucial aspect of our experience of the world: as mentioned, Aristotle had pointed out that "substance" can be understood as both a category and an individual substance (Aristotle, 1986, *Cat*.: 3b10 and ff.). The latter is for him a *primum datum* (Evangeliou, 1997: 52-53) and represents by definition something that is not categorizable and Aristotle uses the term *tode ti* (Aristotle, 1988, *Phys*.: 185a31-32). Peirce knew very well this problem and had often quoted Duns Scot's term *haecceitas* or thisness for saying the same (Peirce, 1887-1888: 205). Moreover, it is evident that in his semiotic theory the aspect

[6] Quoted in Evangeliou (1997: 52).

that he calls *index* stands precisely for a relation in which we establish a reference to something, i.e. a denotation, without a connotation. This is often brought in connection with Secondness. In other words, the ultimate and individual objects of our experience are not subject to categorization. If we like, it is another way to say the Kantian distinction between noumenon and phenomenon.

This problem has been brought to the attention of the scientific community when dealing with quantum-mechanical events. In fact, an event simply happens and this in a way that is not predictable. If we like to know more about this happening, paradigmatically a detection event, we need certain conditions through which the system that is detected becomes connected in such a way to an apparatus that we can infer something about the former and finally ascribe to it a property. Here, we are able to categorize. However, to categorize means precisely to establish a general class into which these and those things fall. In fact, a property is an *equivalence class* of different detection events (Auletta, & Wang, 2014: sec. 12.4). This short examination shows two important aspects: 1. Whatever property we ascribe, this is not such a simple process as Peirce may have thought about primary qualities but is in fact rooted in complex interaction between things (and also between ourselves and things). so that we cannot speak of a First in the context experience without a Second (and even a Third, what was also acknowledged by him, as mentioned); 2. The basic ontology of our world is resistant to categorization and can in fact be dealt with only in the context of experience. I fully accept Peirce's criticism of Kant about the fact that reality is not such a passive and formless substrate that the German philosopher may have thought, since it is able to correct us. With his splendid words, "real is that which insists upon forcing its way to recognition as something other than the mind's creation" (Peirce, *CP* 1.325); or also: "Where is the real, the thing independent of how we think it, to be found? There must be such a thing, for we find our opinions con- strained; there is something, therefore, which influences our thoughts, and is not created by them" (Peirce, 1871: 468; 1898: 170). Nevertheless, whatever categorization we impose on the world does not and cannot catch its intimate happenings and processes bypassing the way in which we frame them in our categorial apparatus.

If, at the opposite, we follow the suggestion that Secondness is related to our way to denote things without connote them and Firstness (or iconicity) to our way to imagine things without denotative import (which are clearly two limiting

cases). this is precisely the way to describe how we make experience and is so far fully correct. However, we cannot assume that we deal here with the metaphysical constitution of reality. In other words, I am suggesting that there is in Peirce's work a potential conflict between the three categories understood as framing our experience (and as rooted in logic) and their understanding as the basic ontological categories. I also remark that the incongruences that I have noted among different Peircean formulations are due precisely to the difficulty to have a univocal ontological definition of these presumed categories. I admit that many of Peirce's expressions could be interpreted in one sense or the other. Nevertheless, I think that would greatly help the spreading and assimilation of his philosophy if we overcome any ambiguity on this point.

Nevertheless, we could frame the three categories in terms of heuristic principles (Auletta, 2011b: c. 3) dealing with very *general* aspects of our world: random events (of any kind at all level: physical, biological, mental). correlations (of any kind and again at any level). itinerant dynamics (i.e. dynamics of any kind able to produce novelty). Then, following Peirce's core thinking, we could say that (1) a fundamental dimension of reality is represented by the *spontaneity* of happenings grounding the irreducible *variety* of nature that we observe; (2) Nature displays the capability to exert *constraints* and to *canalize* phenomena giving rise to convergences at all levels of complexity; (3) Nature displays an itinerant dynamic interplay between happenings and constraints.

2.2 *Different forms of relation*

Peirce has well understood the distinction between correlations (Secondness) and triadic relations like somebody giving something to somebody else (Peirce, 1903a: 170-71; 1903b: 272-73). However, he considers both kinds of relation in dynamical terms as far as he understands Secondness as clash and resistance and thirdness as process. As mentioned, this is a typical of the way in which classical thinkers conceive relations. In fact, the only kind of relation among things that classical physics acknowledged was causality and in particular mechanical or efficient causality (the two notions were considered synonym). It is therefore one of the most important merits of Peirce to have acknowledged that mechanical causality is not the only way through which things are connected. Nevertheless,

since he could not understand relations if not in dynamical terms, he finally acknowledged two kinds of relations (apart form the monadic ones) and of causality: mechanical (brute force) and final (ideal) connections.

It is remarkable that the classical way to consider the problem has still dominated science up at least the half of the last century. In a famous paper published in 1935 by Einstein, Podolsky, and Rosen, it is said that physical systems that do not exchange signals (and thus *a fortiori* are not dynamically connected) need to be considered as separated (no operation of any kind that we perform on one of them can have any kind of effect on the other).

However, the notion of correlation does not demand as such any dynamicity. Logically speaking, it only demands *covariance*. However, as Leibniz first understood, covariance can happen in fully absence of mechanical causal effects, although he interpreted this in terms of the pre-established harmony (Leibniz, 1702; 1710-1712; 1712-1714). This revolutionary insight is again proved by later developments in quantum mechanics where the interdependency among quantum systems that is called *entanglement* is a bond without any exchange of signals. A classical (although imperfect) example is the following: if two different persons read the same newspaper in two different parts of the world, they share *ipso facto* some information (and become therefore correlated) although they have not met and likely will never meet.

It is true that sometimes Peirce speaks of Secondness in terms of "static force" and "constraint" (Peirce, *CP* 1.325). which is fully correct. He also says that the Second is like "like dead matter, whose existence consists in its inertia" (Peirce, 1887-1888: 171). But he also writes: "When we think of Secondness, we naturally think of two reacting objects, a first and a second" (Peirce, *CP* 1.526). If the term "reaction" is intended in the sense of inertia it is very good, but if it is intended in the sense of active resistance, it is not appropriate.

Thus, I suggest to introduce the basic distinction between formal (static) *correlations* as expressed in covariance (and having the nature of ideal and formal realities) and dynamical relations which are ultimately *interactions* (ruling the way in which physical individuals meet). If Peirce had cast things in such a way, his theory of relations would have been much more effective. This brings us immediately to the issue of causation, the next problem to consider.

2.3 *Different forms of causes*

One of Peirce's biggest insights is that a combination of formal or ideal structures with mechanical processes can produce teleonomic and teleological processes, where with the former term I understand processes robust to the initial conditions and bringing to a final state without an explicit goal, while the latter with goal (Auletta, 2011a: c. 8; 2011b: subsec. 3.3.1). This is precisely what we observe in organisms especially when considered in their ecological context. In fact, teleological aspects require agents like organisms, while primitive forms of teleonomic processes can also be found at a prebiotic level especially when complexity is involved. However, the formal or rational part is not what sets the process in motion. Whatever formal structures are in fact inert. They do nothing *per se*, as mentioned. Only efficient or mechanical causes have the power to produce effects. This is also acknowledged by Peirce when he says that cognition alone brings to nothing without effort of some kind. Moreover, he speaks of mechanical causes as "the court-sheriff, the arm of the law" (Peirce, 1902, *EP* 2.121), without which the law would be ineffective. Nevertheless, once activated by mechanical causes, formal causes causally contribute to certain effects that otherwise, in their absence, would not have arisen. In being activated they are pull out from the heaven of ideas to be integrated in the physical world and become in this way true *causes*. As forms in themselves, they are correlations among possibilities and as such, as Peirce clearly knows, they only have an ideal character.

However, this implies that we need to sharply distinguish between formal causes and final ones. Teleonomic or teleological processes can arise precisely through an apt *combination* of mechanical and formal causes. It is true that in fact, in most situations, these two aspects are intertwined, so that Peirce's view is in a sense understandable. However, they need to be conceptually distinguished, and to say that this process is determined in advance by some kind of finality is to put things upside down (Auletta, 2015). In fact, the crucial notion of habit-forming should precisely set things in the correct way by establishing teleology as something *arising* (in the course of evolutionary processes) from, so to say, below and not pre-ordered from above. However, if habit-forming is understood as the law of all laws and as the quintessence of rationality, we risk, as noted, to mix the process and the result. Thus, if we correctly understand at least one of

Peirce's main intentions, Secondness is the mechanical part setting the process in motion, while Thirdness is habit-forming as way to spontaneously generalize (to perform the analogous of inferences). that is to cross these mechanical processes with rational requirements, where the dynamism is only in the former.

However, where is the place of these rational requirements themselves? They should be neither Secondness, nor Thirdness, and I am not sure that they can be framed at all in Peirce's canonical theory of categorization due to the fact that they also fail to be Firstness, even though, as seen, he speaks sometimes of the feeling of qualities as kinds of abstractions: "a fact is an abstracted element of" the "objective history of the universe" (Peirce, 1898: 198). In whatever way things stand, this could explain the whole trouble with synechism, which Peirce correctly connects with the ideal or rational dimension. In other words, I am not sure that Peirce's theory of categories is really helpful for dealing with the issue of the different forms of causes, although many of his insights are crucial for throwing light on this problem.

2.4 *Habit-forming*

Peirce lived long before crucial scientific developments of the 20th century, although he had anticipated some of them, as already mentioned. In particular, he did not have at his disposal a so powerful tool as information theory. Information is so general that it also applies to basic physical systems like the quantum-mechanical ones (D'Ariano *et al.*, 2016). In this very basic understanding of information, no meaning or reference is necessary. At the opposite, if we try to apply the notion of sign (which necessarily demands reference) to the physical world, we undergo some incongruence. I am obviously not denying the validity of Peirce's semiotics. This is one of his most important contributions. What I am saying is that semiotics describes very well the way in which organisms (include humans, at least as far as we consider their biological constitution) deal with the world but is not the general way in which information is exchanged in our universe (Auletta, 2016).

It is not by chance that Peirce resorted to a kind of panpsychism, applying the mental law of habit-forming to the evolution of our universe. I have already observed that this is rather a kind of Lamarckian evolution than a Darwinian

one. This is quite amazing, since Peirce had understood the general characters of evolution and had stressed the importance of selection processes. However, as mentioned, he had inverted the selection step and the transmission step. Now, if we say that, after the production of some variation, we have first selection of some of this variants and then transmission of their "characters" to the next generations, we have a random result of the selection and this is the Darwinian model of evolution. If we say, at the opposite, that first there is transmission and subsequently elimination of what does not fit, we have a process in which selection gives no longer rise to a random result but is purposive in the sense of Lamarckian evolution.

Now, there is no doubt that a fundamental process of the mind is association and therefore habit-forming. However, association is not the only mental process and factor. Although crucial, especially for what memory concerns, other processes, like reasoning, require the application of rules that cannot be derived through association. It is here a situation that is the mental counterpart of what I have said about symmetries in the physical world. It is quite amazing Peirce's stress on associationism in this context as the unique explanation of mental processes when, in his more technical papers and manuscripts on logic (Peirce, 1868a, *W* II.23-24; 1868a, *W* 4.164-65; 1881). he was well aware that inferences require the rule of *modus ponens* or a leading principle ("if propositions of certain description are true, then a proposition related to them in a certain way will also always be true") that, when is maximally abstract, is called logical principle (Peirce, 1898: 131-32). So, as I have mentioned, it is impossible to conceive knowledge and its progress without principles or rules even provisionally postulated. Moreover, association is not purposive. And even when there are clearly purposive elements, like in learning, it is disputable that the Lamarckian model is the correct account of these processes. In fact, learning is the process through which we throw out possible solutions by keeping a subset of them (Auletta, 2011a: c. 14 & 16). Note that this process is endogenous and the teacher does nothing more than giving an appropriate sensory stimulus for setting this process in motion. Only thereafter there is assimilation and consolidation, fine-tuning, of the results, which are certainly processes in which association plays an important role. Thus, also here selection comes first (after production of variants). what shows that also purposive mental processes are ruled by basic Darwinian mechanisms. Moreover, the purposive character of learning is only due to the

complexity of the human mind and of the processes involved here. And this is precisely *the* aspect that cannot be transferred to the physical world.

The reason why selection comes first is due to this circumstance (Auletta, 2011a: secs. 3.2 and 14.1): any selection, independently from its specific mechanisms, which can be very various, needs to be a "choice" among alternative possibilities or possible events. Now, such a selection needs necessarily to be not determined by other factors otherwise it would not be a choice at all but a result determined by certain (univocal) initial conditions. In other words, its result need to be random. Although in complex mental process we try to reduce these random aspects by setting additional conditions that limits its range, it can never be eliminated by any kind of selection or choice, even those that are in fact purposive like true choices.

Thus, we see again that evolution in all domains is a bottom-up process in which there is no finality involved if not in the consequences of this evolutionary process itself. In fact, both necessity and finality are in general in the consequences and not in the antecedents of whatever evolutionary process (Auletta, 2011b: subsec. 3.3.1). Thus, habit-forming, especially in its Lamarckian formulation, cannot be taken as the sole paradigm of any evolution occurring in our universe, although it remains true that repetition of certain behaviours determines the establishment of certain regularities (Auletta, 2011a: secs. 4.1, 12.7, and c. 15-16). Again, I think that Peirce insight was great but formulated in an imperfect and incomplete way. This is especially clear when examining the problem of laws.

2.5 *Evolution of laws*

One of the biggest insights of Peirce is that natural constants and therefore also laws may be evolved with time. This is again a true revolutionary insight. However, it seems that model of habit-forming misled Peirce. In fact, as seen, he assumed that there can be evolution from a state of almost pure chance towards a final state of almost pure law and rationality. However, the inference from the possible evolution of laws to this conclusion is not allowed if not by further assuming that the law of all laws is habit-forming and that habit-forming spontaneously leads to rationality. However, we have also seen that Peirce acknowledges that no regularity can come out of random processes if not thanks to some other

regularity. So, there is no reason to suppose that the initial state of the universe was a pure lawless condition. In fact, everybody now thinks that the laws of quantum mechanics need to be assumed before anything about the arising of our universe can be said. Moreover, there is no reason to suppose that the final stage of the universe will be fully rational. It is true that we humans on the Earth have accommodated the environment to our rational plans, and we can imagine a humanity that will live millions of years and reach such a level of evolution to be able to influence cosmic processes. So, to a certain extent Peirce was right and likely prophetic. However, as again quantum mechanics shows, there are irreducible random events in themselves, and these are likely at the source of many others, like genetic mutations or aging processes. There is no conceivable world in which this random aspect could disappear: if so, would be a dead or at least unfertile universe, since, according to Peirce himself, no novelty could be produced. In fact, Peirce understands variability as an irreducible principle or character of our universe. Thus, at most, and again I hope to catch Peirce's essential way to think, we can say that the strength of reason is in its capability to integrate also what is not rational and not to eliminate it. It is not by chance that Peirce recalls us that Firstness only deals with the general aspects of randomness without presuming to account for random events themselves.

2.6 *Representationalism*

I have mentioned that Peirce's semiotic theory is sometimes formulated in representational terms. This is not necessary. The trouble is that any representation is the result of mental or neural processes that are intrinsic to each individual (and even to specimens of other species) and therefore cannot be shared as such. This is also acknowledged by Peirce when dealing with the iconic side of semiotics. Now, according to its pragmatistic epistemology the concept of a thing is the way in which it has effects on other things, which is rather connected with the indexical side of semiotics. In fact, concepts are certainly connected with representations but have also a different nature and can indeed be operational. It seems that Peirce did not make of this epistemology also an ontology. Concepts are in fact theoretical models of the way in which we have access to things and it is natural to presume that also things interact in this way making different aspects or characters

manifest that we catch by attributing to them properties. Thus we cannot make use of our categories for representing things "in themselves", but we can presume that they interact (and correlate) in ways that are not very different from the way in which ourselves interact (and correlate) with them: recalling the case of detection, I have indeed stressed that the way in which we interact with things is also primary for the categories themselves. In fact, knowledge can be considered as a particular case of the general communication of our universe (and this communication, as mentioned, is governed by the rules of information exchange). I think that this is a true Peircean insight. In fact, Peirce went very near to this view when e.g. he wrote that "a thing may be said to be wherever it acts" (Peirce, 1890b, *W* 8.78).

§3. Conclusions

Peirce says that philosophy is at its beginning and that it is in an infantile condition (Peirce, 1898: 107). As mentioned, his project was to establish robust foundations of philosophy, especially of logical kind, in order to make of this discipline a field comparable with natural sciences. With this I am not meaning that philosophy need to imitate the methods of empirical sciences but rather that it should show the same ability to consistently progress across time with a common tradition universally acknowledged. I think that Peirce gave an enormous contribution in this sense and therefore his work represents an important departure point especially when integrated with the work of some philosophers, most of which were already reference points of the father of pragmatism: I recall here, among others, Plato, for his view that ideas have an objective reality and that the process of knowledge is endogenous, and Aristotle, for his doctrine of individuals constituting primary ontology and his explanation of the process of knowledge starting from the stimulus of experience; Aquinas and Duns Scot, especially concerning the integration of the views of the two Greek philosophers; Locke and Hume as the fathers of associationism; Leibniz and Kant for their theory of relations and the stress on the logical-constructive nature of the mind. In particular, I think that the departure from his early nominalism has sometimes brought Peirce to underestimate the dimension of individual facts and interactions, which for Aristotle represented the primary ontology. It is here that

a development of the Middle-Age integration of these views, together with the mentioned contributions of modern philosophers, can be very helpful. Moreover, we need to integrate his work with the subsequent scientific developments. This is again in the spirit of Peirce's research, since he considered the fact that philosophy "has come to be set off from the other sciences" an "unfortunate accident" of his time (Peirce, 1898: 117).

The worst thing that we can do with Peirce's work is to take his thought literally and to write on that commentaries on commentaries in order to account and "flatten" some incongruences. At the opposite, his philosophy demands to be used and put at work, and the only way to do that consistently is precisely to integrate this immense intellectual effort with both the previous philosophical tradition and the subsequent scientific developments.

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