The social imaginary arche in ontological philosophy by Cornelius Castoriadis: Dimensions of imagination in social institutions and scientific praxis

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The social imaginary arche in ontological philosophy by Cornelius Castoriadis

Dimensions of imagination in social institutions and scientific praxis

Doctoral Dissertation

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Abstract

The herein thesis aims to approach social institutions and scientific praxis under the ontology of social imaginary as illustrated by Cornelius Castoriadis, the primary philosopher on creative imagination and social imaginary, and to fuse the social imaginary arche with the concept of the human Eigenwelt and the philosophy of science.

Prior to the topics concerning the abovementioned theory, in the first chapter this thesis attempts to pinpoint the scientific object through the scope of the distinction between observable and non-observable natural reality. Drawing from contemporary physics and tracing the same thought back in the history of ontological philosophy, non-observable phenomena constitute the part of natural reality that, albeit mathematically existing, still escape the direct perception through either scientific experimentation or empirical observation. Thusly incorporating the chaotic element on the field of scientific praxis, non-observables render scientific theories locally applicable only to a part of natural reality, but essentially incomplete and unable to explain by themselves the foundations of their own applicability. Hence, in order for scientific statements to become at least *quasi* complete, imagination comes to play in the attempt to straddle on the chaotic area and substitute the missing scientific primaries with axioms that serve as metaphysical, yet scientific, presuppositions – not logically deduced, but imaginarily posited.

This conclusion leads the herein thesis to the second chapter, where the concept of imagination according to Castoriadis' own contemporary theory is unfolded. Stressing the importance of the radically creative and social-historical dimension, instituting imagination is ascended to the surviving condition for the human being and the unique faculty of its collective existence. On the level of the singular individual and through the scope of psychoanalysis, Castoriadis adopts the passage from the psychic monad to the social individual through socialization: the primary state of the human being is ruptured by its contact with the social-historical realm and emerges as its subject, while still retaining its monadic state. This dyadic ontology introduces imagination as the common reference point for both of its counterbalancing dimensions: radical for the psyche, social for the individual. Thus given, imagination opens the discussion on the realm of metaphysics as an independent ontological field, coexisting with the physical realm and bound with its social-historical dimension.

In the third chapter, creation ex nihilo is revealed to be the vessel of the creative social imaginary. Despite the contrary statements of traditional philosophy, the ontological milestones of radical creation are the primary chaotic element, along with time as the key to ontological succession. In that sense, creation assumes the form of radical otherness, according to which a new figure is not produced from a past figure, because their succession does not comply with any rational connection, since every time figures are emerging and cannot be fully related to the past instances, even if they originated from them. Nonetheless, creation is subject to strict and multimodal constraints, because, albeit being *ex* nihilo, still it is neither *cum*, nor *in* nihilo. Such constraints are external, internal, historical and intrinsic. Thus considered, ontological figures do not bear any rational, nor determinable, connection with their *arche*, whereas the conditions for the emergence of a novel figure are indeed necessary, but never sufficient.

The fourth chapter discusses the mission of social imaginary, which aims to provide answers to the unanswerable ontological questions that every society posits to itself. These answers are provided through social imaginary significations, symbolized via social institutions, which nonetheless remain *quasi* finite and non-logically grounded – else, incomplete and arbitrary. In addition, instituted social significations are characterized by a dyadic ontology: they embody an ensemblistic-identitary and an imaginary dimension. A characteristic example of this dyadic mechanism is language, on the ontology of which Castoriadis disagreed with Chomsky and his theory of 'universal grammar'.

Parenthetically, the fifth chapter provides a historical retrospect concerning the concept of imagination as traditionally understood by main currents of ontological philosophy and in dialectical comparison with social imaginary by Castoriadis. In the beginning, the birth of imagination is placed during the era of the Greek antiquity and in Aristotle's understanding of 'phantasia', which at first is displayed as the doublet of sensation, but afterwards is acknowledged as a presupposition for logical reasoning by the human intellect. Secondly, during the early period of Modernity, Leibniz introduced the concept of 'blind thought', in order to indicate that human reasoning is majorly grounded on thoughts empty of empirical perception. Lastly, during the romantic era of Modernity, Kant reintroduced imagination under the scope of 'produktive Einbildungskraft', the faculty of which is attributed with an empirical and a transcendental aspect and bears the capacity to represent an object even without its presence in intuition. Especially intriguing for Castoriadis was the fact that in his last *Critique* Kant referred in passing to imagination as creative, nonetheless without further elaborating on that characteristic.

Further to the sixth chapter, these social imaginary significations, along with the relationship of the human as a living being with its environment, formulate the human Eigenwelt on the social-historical strata, which is not universal, but distinctively differentiated in accordance to each respective society. The importance of the human Eigenwelt lies with the perception of the social individual, the sensation input for which is primarily drawn as a personal experience, but is given instantly meaning – else, is 'colored' –by the social imaginary significations that reside in the respective Eigenwelt. Therefore, the thesis hereto concludes that natural reality is projected in a social-historical reflection, insofar as its sensibility is determined by the capacity that a human Eigenwelt inscribes on the sensors of its individuals.

In order to link the concept of creative imagination with scientific praxis, the seventh chapter of this thesis points to the role of imagination in forging the scientific axioms. To elucidate the essence of natural reality, Castoriadis adopted the concept of the first natural stratum, which on the one hand is locally organizable by any living being, on the other hand remains chaotically heterogeneous, meaning non-organizable in totality. That being said, concerning the ontology of scientific axioms, Poincare asserted that every scientific statement expresses simultaneously two entangled dimensions, an empirical and a conventional – non-empirical. For the latter he projected the term 'convention' in order to describe the parts of scientific theories that are not empirically proved, yet are chosen non-arbitrarily to be the most convenient to serve as the fundamentals for their quasi-completeness. This line of thoughts is parallel with Castoriadis' viewpoints on scientific praxis, according to which axioms are imaginary creations, but still retain their non-arbitrariness as

an ensidic characteristic. Therefore, the thesis hereto concludes that scientific axioms embody metaphysical theses that stand as the ontological arche for the development of scientific praxis.

Based on these assertions, the final ninth chapter uncovers the problematic on the social imaginary arche in scientific praxis, where is suggested that scientific axioms are instituted social significations, born by the same imaginary element. Following that social imaginary extracts the identitary-ensemblist logic from the first natural stratum, scientific praxis is assigned additionally a social-historical dimension, which renders it diverse for each respective human Eigenwelt. In that sense, in the beginning of every scientific syllogism resides a social imaginary arche and, as a result, social imaginary significations are serving as instituted scientific axioms. Given that claim, Castoriadis argues that the history of science constitutes of a sequence of creative ruptures that lead to the succession of scientific world-theories, whereas the social individual and its creative potentiality becomes the only possible 'knowing subject' for scientific reality under the orientations given by its Eigenwelt.

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1. ***Introduction: Aim and Issues***

The concept of social imaginary by Cornelius Castoriadis has been a breakthrough for the questions of ontological philosophy, as inherited by the ancient Greek antiquity and the Western Modernity, although remains ignored by the main academic currents of our era. The herein thesis aims to approach social institutions and scientific praxis under the ontology of social imaginary and to fuse the social imaginary arche with the concept of the human Eigenwelt and the philosophy of science. To that end, the text follows the work of Castoriadis, scattered as it is, in order to provide a wide picture of his work for the hereto problematic, while attempting a dialectical approach for some of its fundamental aspects.

The triggering questions lie with the following topics: firstly, what is the essence of natural reality as a scientific object; secondly, what is the role and the nature of imagination in general; thirdly, how is social imaginary projected on the physical and metaphysical realms; fourthly, how the social-historical world is formulated and how it affects the perception of the social individuals; fifthly, how are the fundamental scientific axioms emerging; and lastly, how the social imaginary posits the arche of scientific praxis.

Tending towards a possible answer, this paper adheres to the following ontological milestones: firstly, that the scientific object is divided between the observable and non-observable natural reality, the latter of which exceeds the capacity of human perception and opens the metaphysical realm for scientific praxis; secondly, that the ontology of social imaginary points to imagination as 'kreative Einbilundgskraft' and as an a-causal 'vis formandi' upon the monadic psyche towards the social individual and upon the non-knowable and the chaotic area of Being, thus unfolding the metaphysical realm as an independent ontological level; thirdly, that the vessel of social imaginary is creation ex nihilo, as the form of ontological genesis under constraints, that may even partially formulate natural reality, especially biological behavior; fourthly, that, in the attempt to provide quasi finite answers for the principal, yet unanswerable, questions, the social-historical world creates social imaginary significations, projected through social institutions and bound with a distinct dyadic ontology, that serve as the metaphysical arche for its existence; fifthly, that, based on that social imaginary arche, the human Eigenwelt is formulated, corresponding to the respective social-historical circumstances, to the extent of which the sensible perception of its individuals are distinguished as meaningful; sixthly, that in accordance to the respective Eigenwelt scientific axioms are born as imaginary, non-arbitrary creations and, as such, are empirically neither verifiable, nor falsifiable; and, seventhly, that these scientific axioms are socially instituted by the respective social-historical realm, bound to its social imaginary arche, that would explain the historical succession of scientific theories and the emergence of the social individual as the only possible 'knowing subject' for scientific reality.

The hereby thesis elaborated the aforementioned topics as follows: in the first chapter, it is attempted to pinpoint the scientific object through the scope of the distinction between observable and non-observable natural reality; in the second chapter, the concept of imagination according to Castoriadis' own contemporary theory is unfolded; in the third chapter, creation ex nihilo is revealed to be the vessel of the creative social imaginary; the fourth chapter discusses the mission of

social imaginary, which aims to provide answers to the unanswerable ontological questions that every society posits to itself; parenthetically, the fifth chapter provides a historical retrospect concerning the concept of imagination as traditionally understood by main currents of ontological philosophy and in dialectical comparison with social imaginary by Castoriadis; further to the sixth chapter, it is suggested that the social imaginary significations, along with the relationship of the human as a living being with its environment, formulate the human Eigenwelt on the social-historical strata, which is not universal, but distinctively differentiated in accordance to each respective society; in order to link the concept of creative imagination with scientific praxis, the seventh chapter of this thesis points to the role of imagination in forging the scientific axioms; ultimately, the final ninth chapter uncovers the problematic on the social imaginary arche in scientific praxis, where is suggested that scientific axioms are instituted social significations, born by the same imaginary element.

2. ***Cornelius Castoriadis: A brief synopsis***

Despite his originality on the philosophical field, Cornelius Castoriadis has been rather unfamiliar to – and sometimes even ignored by – the academic community, especially his claims on the field of philosophy of science. Since his ontology will be the primary figure of the hereto analysis, a synoptic introduction to his philosophical origins would be helpful, along with the discussions his thought provoked among his contemporary thinkers and his following commentators.

In general, this project adopts Castoriadis' ontological system as depicting validly the social reality through the concepts of social imaginary and creation *ex nihilo*. Roughly ascending from imagination as traditionally understood by Aristotle and Kant, it is coherent to acknowledge the following: that social institutions do not stand upon strict causal relations; that social imaginary, drawing its origins from a chaotic element, renders the ontological sequence constantly determining and, as such, non-determinable; that social differences reveal radical otherness and self-alteration through historical ruptures and against traditional ontological logic; that institutions are created *ex nihilo*, resulting in the self-instituting and self-instituted society; and, finally, that social imaginary formulates the human own-world, else its Eigenwelt, which bears the capacity to even affect our biological behavior without changing the biological structure.

In addition to these fundamental ontological milestones, this thesis attempts to proceed beyond Castoriadis' main ontological theory and elucidate its contributions in the philosophy of science, which are majorly ignored by the respective field. Indeed, according to his studies related to scientific method and praxis[1], Castoriadis claims that the Being is partially organizable, yet

[1] Most critical texts for the hereby thesis are the following: C. Castoriadis, *The Imaginary Institution of Society*, 1987, translated by Kathleen Blarney, Polity Press, Cambridge, especially the fourth chapter "The Social-Historical", pp. 167-220, and the fifth chapter "The Social-Historical Institution: *Legein* and *Teukhein*"; Preface (1977, in French), pp. 5-28, and Science moderne et interrogation philosophique (1973, in French), pp. 191-288, in *Les Carrefours du Labyrinth*,

irregularly and heterogeneously stratified, meaning that a common logic is not applicable to all ontological strata; that, as such, a chaotic element resides even in the first natural stratum, which is thusly rendered susceptible to formulation by imagination; that social-historical leans on the first natural stratum, which allows its partial, yet non-arbitrary, formulation by the social imaginary; that scientific theories are the mediums for this formulation, as they are instituted as non-arbitrary, but still imaginary creations; and that, finally, the scientific axioms, upon which the scientific theories are built, are bound to a social imaginary arche, extracted from the respective social Eigenwelt they emerged.

2.1. Background and origins

Cornelius Castoriadis was born to a Greek family in Constantinople and spent most of his life in Paris. In terms of philosophical origins[2], he began as a Marxist, but later on, influenced by praxis philosophy and French currents of phenomenological Marxism, he strongly criticized the orthodox, soviet version of communism and searched for theoretical models of the revolution project towards the concept of autonomy, which remained henceforth his primary social-political project. His focus on autonomy and creative imagination reveals two distinct sources of inspiration: on the one hand, ancient Greek philosophy, especially Aristotle, along with epic poetry and ancient drama; on the other hand, European philosophy, including Kant and early Romantics, and contemporary sociologists, such as Max Weber, Merleau-Ponty, Emile Durkheim and Levi-Strauss. A significant addition to his philosophical evolvement was psychoanalysis, namely under the teachings of Freud and Lacan. Regarding the meaning of revolutionary praxis, similarities with Hannah Arendt have been ascertained, whereas in his theory of self-instituting society influences have been observed from late Heidegger and early Fichte. Despite spending his lifetime during Postmodernism, Castoriadis opposed the general spirit of his current era, associating his contemporary movements with the general dominating conformism of the post-war period[3].

1978, Editions du Seuil; The Imaginary: Creation in the Social-Historical Domain (1984), pp. 3-18, The Ontological Import of the History of Science (1985), pp. 342-373, in *World in Fragments-Writings on Politics, Society, Psychoanalysis and the Imagination*, 1997, translated and edited by David Ames Curtis, Stanford University Press, California; The Greek Polis and the Creation of Democracy (1983), pp. 267-289, and Done and To Be Done (1989), pp. 361-417 in *The Castoriadis Reader*, 1997, translated and edited by David Ames Curtis, Blackwell Publishers Ltd, Oxford; and False and True Chaos (1993), pp. 381-394, in *Figures of the Thinkable*, 2005, Electro-Samizdat edition.

[2] For this topic, see J. Habermas, Excursus on Cornelius Castoriadis: The Imaginary Institution, in *The Philosophical Discourse of Modernity*, 1987, Polity Press, Cambridge, p. 329-30; A. Honneth, 'Rescuing the Revolution with an Ontology: On Cornelius Castoriadis's Theory of Society', *Thesis Eleven*, vol. 14, 1986, p. 62-7; S. Adams, I. S. Straume, Castoriadis in dialogue, in *European Journal of Social Theory*, 15(3), 2012, p. 290-1.

[3] C. Castoriadis, Done and To Be Done, p. 415, where it is stated that "*the population plunges into privatization (MCR), abandoning the public domain to bureaucratic, managerial, and financial oligarchies. A new anthropological type of individual emerges, defined by greediness, frustration, generalized conformism (which, in the sphere of culture, is pompously labelled postmodernism.*" See also C. Castoriadis, The Retreat from Autonomy: Postmodernism as Generalized Conformism, *Democracy & Nature*, 2001, Vol. 7, No. 1, pp. 17-26.

Regarding the theory of social imaginary, Castoriadis was most probably the first philosopher to address the topic in the form that is acknowledged today. Of course, the term 'imaginary' must be distinguished from the same term, as it was used in European philosophy (e.g. by G. W. Leibniz[4]). In a similar, but not tautological, manner, imaginary had been earlier used by Jacques Lacan[5], but was strictly given psychoanalytic meaning, as one of a triptych of terms in the psychoanalytic theory, along with the symbolic and the real. Following that, the same topic was earlier than Castoriadis addressed by Paul Ricouer[6] and later by Charles Taylor[7], who both challenge the problematic of social imaginary, but in a different manner[8].

2.2. Discussions by contemporary thinkers and following commentators

It is true that Castoriadis has received intense criticism from his contemporary and distinguished thinkers, such as J. Habermas[9] and A. Honneth[10], but was focused mainly on the defense of traditional ontology, especially regarding the relation between society and individual and among the individuals themselves.

J. Habermas placed Castoriadis' work in the praxis philosophy and recognized his contribution to the respecting field[11]. Nonetheless, his opposition is focused on the interaction between the socialized individuals and the social institution[12]. Regarding the topic of the hereby

[4] G. W. Leibniz, On the method of distinguishing real from imaginary phenomena, in *Philosophical Papers and Letters*, vol. II, 1956, translated and edited by L. E. Loemker, The University of Chicago Press, Illinois, pp. 602-607.

[5] J. Lacan, *The four fundamental concepts of psycho-analysis*, 1978, edited by Jacques-Alain Miller, translated from the French by Alan Sheridan, Norton, New York.

[6] See among other Paul Ricoeur, *Time and Narrative*, 1984, vol. 1, trans. Kathleen McLaughlin and David Pellauer, Chicago, University of Chicago Press.

[7] C. Taylor, *Modern social imaginaries*, 2004, Durham, Duke University Press. However, according to Taylor, social imaginary is developed under the scope of Catholicism, a concept directly opposing the core of Castoriadis' perspective. See also the comparative research between Castoriadis and Taylor by K.E. Smith, *Meaning, Subjectivity, Society – Making sense of Modernity*, 2010, Brill, Leiden.

[8] In all fairness, an exception to this point lies with the Japanese philosopher Miki Kiyoshi (1897-1945), who had already addressed the concept of social imaginary in Kōsōryoku no ronri dai-ichi (『構想力の論理第一』 The Logic of the Imagination, Part One), in the journal *Shisō* (『思想』 Thought) 1939. For an introduction to his thought, see John W. M. Krummel, Introduction to Miki Kiyoshi and his *Logic of the Imagination* (emphasis on the original), *Social Imaginaries* 2.1, 2016, p. 13-24. For an elaboration of the historical sequence of imagination, tracing back from Aristotle and Kant to Ricouer, Castoriadis, Taylor, Miki Kiyoshi and Nakamura Yujiro, see J. Krummel, Creative Imagination, Sensus Communis, and the Social Imaginary, in *The Bloomsbury Research Handbook Of Contemporary Japanese Philosophy*, 2017, Bloomsbury, pp. 255-284. However, apart from the fact that Miki died before Castoriadis' philosophical maturity, it is highly probable that he was not known by Castoriadis, because until today he has never been fully translated in English from Japanese.

[9] J. Habermas, p. 327. To this dispute, J.M.Bernstein, 'Praxis and Aporia: Habermas' Critique of Castoriadis', 1989, *Revue européenne des sciences sociales*, T. 27, No. 86, p. 111, attempted a contribution in favour of Castoriadis.

[10] A. Honneth, p. 62

[11] J. Habermas, pp. 327-335

[12] J. Habermas, p. 330

project[13], according to Habermas Castoriadis excludes intersubjective praxis from his ontological perspective due to the decisive effect of the imaginary dimension. That is to say, Castoriadis addresses "*the problem of conceiving the world-disclosing function of language in such a way that it can connect up with a concept of praxis with normative content*"[14]; however, to that problem "*Castoriadis lacks solution, because his concept of society in terms of fundamental ontology leaves no room for an intersubjective praxis for which socialized individuals are* accountable"[15]. In that sense, whereas "*social praxis disappears in the anonymous hurly-burly of the institutionalization of ever new worlds from the imaginary dimension*"[16], the traits of human actions originate not from just social, but from social creating institution[17]. In addition, despite the fact that the imaginary element dimension originates primarily from the monadic psyche and its unconscious[18], Habermas claimed that no figure of mediation is provided between the individual and society[19].

However, Castoriadis accepts that, under the scope of social autonomy, "*an intersubjective action is actually possible*" and "*is not condemned to remain useless or to violate by its very existence what it posits as its principle*"[20]. That is because the concept of autonomy among the social subjects is favored in comparison with "*the old philosophical idea of abstract freedom*"[21]; thus, the autonomy of the other is regarded "*not the pure and simple elimination of the discourse of the other but the elaboration of this discourse, in which the other is not an indifferent material but counts for the content of what is said*"[22]. In that sense, intersubjective praxis between individuals is neither omitted nor ignored in Castoriadis' ontological system and, consequently, the social individuals are held responsible for their actions or omissions[23] – especially when social institutions favor autonomy[24]. Nonetheless, intersubjective relation "*is located in a larger ensemble, which is the social*"[25]; that means, "*if autonomy is the relation in which others are always present as the otherness and as the self-ness of the subject, then autonomy can be conceived of, even in philosophical terms, only as a social problem and as a social relation*"[26]. Hence, the problematic of autonomy does not refer only to the relation of one subject to another, but is most importantly recognized as a "*collective enterprise*"[27]. In the end, whereas the social-historical is not the unending addition of intersubjective networks[28], the intersubjective remains "*the material out of*

[13] The clarification is essential, because most criticizing points by Habermas focus on the correlation between self-instituting society and autonomy – a topic which is not relevant hereto.
[14] J. Habermas, p. 330
[15] J. Habermas, p. 330
[16] J. Habermas, p. 330
[17] J. Habermas, p. 332
[18] J. Habermas, p. 333
[19] J. Habermas, p. 334
[20] Both quotations are from C. Castoriadis, *The Imaginary Institution of Society,* p. 107.
[21] C. Castoriadis, *The Imaginary Institution of Society, p*. 107
[22] C. Castoriadis, *The Imaginary Institution of Society, p*. 107
[23] C. Castoriadis, *The Imaginary Institution of Society, p*. 107
[24] C. Castoriadis, *The Imaginary Institution of Society, p*. 384, note 40
[25] C. Castoriadis, *The Imaginary Institution of Society, p*. 108
[26] C. Castoriadis, *The Imaginary Institution of Society, p*. 108
[27] C. Castoriadis, *The Imaginary Institution of Society, p*. 108
[28] C. Castoriadis, *The Imaginary Institution of Society, p*. 108

which the social is made but this material exists only as a part and a moment of the social, which it composes but which it also presupposes"[29].

In addition, Habermas rejected Castoriadis' assertion that psyche and society are mutually irreducible, because this claim establishes "*'metaphysical opposition' between the two*"; Castoriadis countered that this statement is based on the idea that "*every affirmation of irreducibility is 'metaphysical'*" and, as such, the rational approach points to "*a unitary and reductionist metaphysics*"[30]. However, the notion, according to which "*there is nothing that is irreducible*", is actually signifying that "*the Essence of the Whole is the Same; phenomenal differences boil down to -differences of quantity, combinatory differences, etc.*" – a metaphysical stance that Castoriadis considers false[31].

To this discourse between Castoriadis and Habermas, *J. M. Bernstein* interfered and provided further arguments in favor of Castoriadis[32]. According to Bernstein, the root of the opposition is located in the different philosophical origins, upon which each thinker founded his ontological perspective[33]. Thus, the aim of each one is distinct; whereas Habermas attempts to provide a theory of social reality, Castoriadis concentrates on the elucidation of human existence in the framework of social doing[34]. And precisely this approach is grounded on the social imaginary significations, which embody the concept of indeterminacy as an act of constant determining[35]. Nevertheless, this main idea contradicts the inherited thought towards determinacy, which is represented hereto by Habermas under the term 'communicative rationality'[36]. On the contrary, Bernstein, after criticizing Habermas[37], observes that Castoriadis introduces an *aporetic* social ontology, which "*poses the being of the social-historical as neither act nor product, neither instituting nor instituted, but as the continual passage from one to the other without rest or resolution*"[38]. From this aporia, social creation arises, which is regarded neither as a product of natural process, nor as an act of absolute freedom[39], whereas, without explanatory antecedents, social creation thusly remains non-rationally determinable[40]. However, this ontological status is excluded from Habermas' rationalism[41], according to which creation as ontological genesis is denied[42] – an ascertainment that by itself explains the contradiction between the abovementioned thinkers.

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[29] C. Castoriadis, *The Imaginary Institution of Society, p*. 108
[30] C. Castoriadis, Done and To Be Done, p. 376
[31] C. Castoriadis, Done and To Be Done, p. 376
[32] J. M. Bernstein, Praxis and Aporia: Habermas' Critique of Castoriadis, in *Revue européenne des sciences sociales*, T. 27, No. 86, 1989, Librairie Droz, pp. 111-123.
[33] J. M. Bernstein, p. 112
[34] J. M. Bernstein, p.114-5
[35] J. M. Bernstein, p.115
[36] J. M. Bernstein, p.115
[37] J. M. Bernstein, p.115-118. Main point of the criticism is the abstractedness of communicative rationality.
[38] J. M. Bernstein, p.119
[39] J. M. Bernstein, p.119
[40] J. M. Bernstein, p.120. To that end, Kant's thoughts on aesthetic production are commented.
[41] J. M. Bernstein, p.121
[42] J. M. Bernstein, p.122

Towards a criticism similar to Habermas', *A. Honneth* attempts to locate Castoriadis' philosophical origins, on which his ontological perspective is based[43]. After describing the most important terms concerning Castoriadis' philosophy of praxis, Honneth states that his critique stands against not only the traditional logic of identity[44], but also the contemporary social sciences[45]; and, although the related ontological speculations are regarded as "*adventurous*", still it is recognized that these are supported by "*instructive and convincing arguments*"[46]. However, inasmuch as the main point of reference remains the subject's cognitive or psychic energies[47], Honneth claims that "*the human being is not the conscious author, but nevertheless is the vehicle of such creative productions*"[48]; hence, this could lead only to a theoretical basis, limited only in "*human, social world, but not for the processes of being in general*"[49]. Furthermore, Castoriadis is compared with Bergson in his latest works and is found "*more restrained methodically, and cautious theoretically*"[50]. Nevertheless, due to the similarity with bergsonian terms, Honneth implies idealistic origins in Castoriadis' ontology[51] and concludes that "*fleeing from its own radicalism, his theory of society leads in the end into a metaphysical cosmology which today can scarcely be discussed with scientific arguments*"[52].

Against the abovementioned criticizing remarks, Castoriadis himself rebutted that "*we do not philosophize - we do not concern ourselves with ontology – in order to save the revolution (Axel Honneth) but in order to save our thought, and our coherency*"[53]. Furthermore, even Honneth "*is postulating at least a regularity and stability to phenomena, sufficient as to need/usage [as Aristotle would say], which no transcendental consciousness, no* Wesenschau*, no intersubjective communication could produce or draw out of themselves*"; that supposition in turn reveals that "*since total Being/being manifests itself, as well, as concrete and effective organization (order,* kosmos*) […] ontology is also, necessarily, cosmology*"[54]. What is more, even if the notion of creation abandons any categorial determinacy, still Castoriadis distinctly acknowledged the idea of absolute and complete indetermination as "*a logical error*", to which Honneth had fallen[55]. On the contrary, by denying both absolute determinacy and absolute indetermination, Castoriadis projects the notion of creation as "*the* positing *of* new determinations – *the emergence of new forms,* eide*,*

[43] A. Honneth, pp. 62–78.
[44] A. Honneth, p. 72-4
[45] A. Honneth, p. 68,
[46] A. Honneth, p. 75
[47] A. Honneth, p. 77
[48] A. Honneth, p. 77
[49] A. Honneth, p. 77
[50] A. Honneth, p. 74
[51] A. Honneth, p. 75
[52] A. Honneth, p. 77
[53] C. Castoriadis, Done and To Be Done, p. 361
[54] C. Castoriadis, Done and To Be Done, p. 362. To that statement is also iconically added that "*as [Moliere's character] Monsieur Jourdain spoke prose without knowing it, Honneth puts the weightiest cosmological postulates into action when he sits down in front of his typewriter or when he goes out into the street: he acts as if he were certain that the former was not going to explode in his hands or that his fellow citizens had not been transformed, overnight, into headhunters*".
[55] C. Castoriadis, Done and To Be Done, p. 369

therefore ipso facto *the emergence of new laws – the laws appertaining to these modes of being*"; therefore, concerning this debate, Castoriadis concludes that "*at the most general level, the idea of creation* implies *indetermination* uniquely *only in the following sense: the totality of what is is never so totally and exhaustively 'determined' that it might exclude (render impossible) the surging forth of new* determinations"[56].

Drawing from the aforementioned arguments, we may provide the following thoughts to counter Honneth's critique. Firstly, any concept of social ontology concentrates only on human species. This principle originates from Aristotle, who distinguishes between animals that develop some social characteristics and humans as the social animals that are naturally organized in social structures[57]. It is of course true that whether animals also have consciousness is unknown; nonetheless, inasmuch as the effect of cognitive or physic factors on humans is adequately evident, that is enough to separate the social analysis of humans from the other species. Therefore, every social concept correlates only with human society; thus, due to insuperable differentiations among its special aspects, Being as a whole cannot be included under the scope of the same ontological perspective. After all, this thought is thoroughly developed in Castoriadis' later works, where his attention is drawn by the irregular stratification of the whole Being, while consciously through biological autopoiesis attributing a creative radicality in physis itself. Secondly, the psychoanalytic fundamentals of Castoriadis' theory depict the uniqueness of human species, without restricting the potential of creation; on the contrary, despite seeming as *vehicle*, human being is regarded simultaneously as the creator and the creation of social imaginary, even if this is not always achieved consciously. On the other hand, the idealistic origins in Castoriadis' ontology are obscure. It is true that, at least in his first major work, Castoriadis does refer twice to Bergson, but only to indicate the emergence of otherness in language[58] and the socialization of the psyche[59]. Furthermore, the argument regarding the metaphysical, nonscientific claims of Castoriadis is based on the obsolete distinction of materialism and idealism. Nonetheless, drawing from the principles of the Freudian psychoanalysis, imaginary refers indeed to metaphysical, but not to supernatural. Moreover, in order to articulate social imaginary in correlation with the first natural stratum, Castoriadis muster deductions deriving from pure Physics. Thus, the ontological analysis is abundant with scientific arguments, which do not allow any opposite claim. Besides, it is his common standpoint that "*the path of philosophy (ontology, metaphysics) necessarily opens up when one reflects upon mathematics, physics, or biology*"[60].

Among Castoriadis' modern commentators, *Suzi Adams* contributed a thorough descriptive analysis of his strictly ontological work, which is often overtaken by his political project on autonomy. Assuming a majorly positive approach to his work, Adams draws on "*hermeneutical methods of critique, tracing subterranean and unfinished lines of arguments, tensions and latent*

[56] C. Castoriadis, Done and To Be Done, p. 369
[57] Aristotle, *Politics*, trans. B. Jowett, 1885, Oxford University Press I, 1253a, p. 4-5.
[58] *C. Castoriadis, The Imaginary Institution of Society, p*. 218
[59] *C. Castoriadis, The Imaginary Institution of Society, p*. 301
[60] C. Castoriadis, Done and To Be Done, p. 362

tendencies internal to Castoriadis's oeuvre"[61] under the general supposition that "*Castoriadis builds bridges between Enlightenment and Romantic worldviews*"[62]: one the one hand, "*there is a dual Romantic motif: the imagination and meaning*"; on the other hand, Enlightenment is rooted in "*his unwillingness to reject rationality, but also in his refusal to envelop human modes of being within a cosmic whole*"[63]. Thus depicted, Adams works on the classical dipole of *nomos* and *physis* and, as such, deduces the first ontological shift by Castoriadis in 1975 when he published his magnus opus, The Imaginary Institution of Society, through which "*he looked to elucidate a* regional *ontology of the social-historical as a way of fleshing out the being of* nomos" and "*presumed that ontological creation of form was limited to human modes of being*"[64]. In addition, his second ontological shift was grounded on "*his reconfiguration of the* nomos *and* physis *problematic, which incorporated a second ontological shift to a transregional ontology of creative physis in the 1980s*", when Castoriadis acknowledged "*a second image of being that, while still intrinsically heterogeneous, was characterized by* self-creation *in* all *of its regions, not just human regions*", meaning "*a deeper sense of the "transregionality" of being as creation*" that "*came to be articulated as creative* physis *as* a-etre"[65]. Therefore, Adams situates Castoriadis in the movement of 'post-transcendental phenomenology', which aims to conceptualize "*the ways in which phenomenology has transformed itself from a subjective and intersubjective philosophy to one that interrogates transsubjective (and transobjective) horizons*", as well as to highlight "*the importance of (socio-)cultural analysis, and of culture as the articulation of the human encounter with the broader world horizon*"[66].

Karl E. Smith approaches thoroughly the problematic of meaning under the perspectives of Castoriadis and of Charles Taylor[67]. Specifically put, Smith accepts the concept of creation, meaning that "*the human subject is created by a dynamic psychic flux moulding itself, and being moulded to conform, at least to some extent, with its social environment*"[68]. That is, the social significations render the institutions fluid and undeterminable[69] and, as a result, the self-creation of *nomos* is introduced[70]. Concerning the intersubjective relationships, he argues that the institution of social interaction precedes social subjects[71]; thus, the social-historical "*characterizes all of the dimensions of any given society, institution or subject*"[72]. However, at the same time, he criticizes Castoriadis for not addressing with precision the individual action, especially concerning moral values and choices[73]. Therefore, Smith deduces an absence of a complete theory of action, which

[61] S. Adams, *Castoriadis's Ontology-Being and Creation*, 2011, Fordham University Press, New York, p. 11.
[62] S. Adams, p. 8
[63] S. Adams, p. 9
[64] S. Adams, p. 3
[65] S. Adams, p. 3
[66] S. Adams, p. 5
[67] K. E. Smith, p. 1
[68] K. E. Smith, p. 129. See also p. 57.
[69] K. E. Smith, p. 45
[70] K. E. Smith, p. 118
[71] K. E. Smith, p. 132
[72] K. E. Smith, p. 156
[73] K. E. Smith, p. 228

would clarify the way, by which personal decisions and actions lead to the instituting of a society[74]; besides, history as a result of conscious individual action is then degraded[75]. In addition, Smith generally consents with the notion, under the light of which the social-historical is leaning on the first natural stratum[76] and simultaneously natural science cannot answer related social questions[77]; as such, the importance of "animal dimension", deriving from human corporeality should not be ignored[78] – even if, at the same time, the uniqueness of human being is based on the capacity towards autonomous ontological creation[79]. Nonetheless, despite that society exists only by creating significations, Smith denies that the ontological perspective should always be reducible to perception, as a means towards significations[80]. Consequently, the author concludes that "*while reality is always mediated by imaginary significations, social action is not always determined by, or explicable in, these terms*"[81]. Furthermore, under a similar scope, Smith defines the self-instituting and self-instituted society as a "*merely conceptual*" concept[82]; that is because, since any society frequently balances from social creation to social idleness, the capacity for the emergence of new institution depends on the existing social framework[83]. In that sense, he favors the term "*creative interpretation*" rather the radical creation ex nihilo[84].

However, addressing with precision the individual action is not a matter of philosophy, but of politics. That being said, instead of seeking perfect social solutions, which would work as panacea for any social problem, ontological philosophy attempts to understand reality, though always in an incomplete manner; otherwise, it would try to determine personal action, which Castoriadis deems as impossible. Furthermore, the concept of creative interpretation does not fully grasp the essence of creation ex nihilo. After all, Castoriadis never recognizes the existence of social idleness; for, even when social change is so slow that cannot be observed, it does not mean that society ceases to change[85].

[74] K. E. Smith, p. 229
[75] K. E. Smith, p. 230
[76] K. E. Smith, p. 123-4, 137
[77] K. E. Smith, p. 124, 126
[78] K. E. Smith, p. 102, 122
[79] K. E. Smith, p. 102
[80] K. E. Smith, p. 138
[81] K. E. Smith, p. 126
[82] K. E. Smith, p. 222
[83] K. E. Smith, p. 238
[84] K. E. Smith, p. 238
[85] See again *C. Castoriadis, The Imaginary Institution of Society, p*. 201.

3. *Pinpointing the scientific object: Observable and Non-observable natural reality*

Prior to the topics concerning imagination and the social-historical world, it becomes fundamentally crucial to pinpoint the objective scope of the contemporary scientific praxis, to which adheres the elucidation not only of the observable, but simultaneously of the non-observable natural reality[86]. Besides, the boundaries of these areas have been – explicitly or implicitly – already traced by philosophers in the history of human thought, extraordinarily earlier than the recent findings of hardcore science. And, since the existence of non-observable natural reality has been scientifically and explicitly acknowledged, then the position of imagination in the methodological toolbox of the scientist has been officially opened.

As such, the aim of the hereby chapter is to approach the limits of scientific knowledge, in accordance to the following questions: firstly, which are the limits of human understanding on natural reality; secondly, which is the source of these limits and their connection with human epistemological capacity; and thirdly, which effect do these limits bear to the structuring of logical sequences[87].

In the first section, the theory of non-observable natural reality, as the source of the human epistemological limits, is developed. In the second section, an indicative historical retrospect is attempted, tracing back from the Archaic and Presocratic period of Greek Antiquity to European Modernity. Finally, in the third section, the ontological impact of non-observable natural reality on structuring human knowledge is discussed, seen through its effect on traditional philosophical presuppositions.

3.1. The non-observable natural reality

3.1.1. Definition: Biocomputer and existing unknowable phenomena

We name 'non-observable natural reality'[88] the natural phenomena or the aspects of natural reality that, even if they are mathematically depicted and fully approved by the dominating mature scientific theories[89], still cannot be directly observed by human experience. In an attempt to

[86] This chapter of the herein dissertation has been separately published under the title "The ontological aspects of non-observable natural reality: Grasping the limits of scientific knowledge" in *AICHI - Φιλοσοφία*, vol. 32, 2021, Kobe University, Japan, pp. 132-165.

[87] The term 'logical sequences' is hereto adopted in order to display the chain of causal conditions that explain the mechanisms of scientific reality. Besides, it is precisely these sequences of scientific evens that are incorporated in a scientific theory.

[88] It is in advance indicated that, for the needs of the hereby chapter, the terms 'non-observable', 'non-sensible', 'non-tangible' and 'non-conceivable' bear almost identical meaning.

[89] Regarding the hierarchization of scientific theories under the criteria of *maturity* and *non-adhocness*, see S. Psillos, *Scientific realism – How science tracks truth*, 1999, Routledge, London, pp. 105-113. For an alternative approach to the topic, see also B. Ellis, *Scientific Essentialism*, 2001, Cambridge University Press, Cambridge, who claims that intrinsic natural properties are themselves the truth makers of their own ontology (p. 217).

elaborate, we can break up the term in two parts, the concepts of biocomputer and of existing unknowable phenomena.

On the one hand, a biocomputer is the hardware in the anatomy of every living being which distinguishes the stimuli that are empirically extracted from its external world and projects only those that are compatible with its natural physiology. Hence, every species of the living being, insofar as it has a differentiated physiology, also bears a distinctive biocomputer, capable of projecting and understanding reality in a different manner and, thus, indicating its Cosmos. Correspondingly for the human being, it is fundamentally presupposed by contemporary science that the epistemic capacity of human physiology bears intrinsic limits. That being said, we may trustworthily claim that not the whole but only a part of the Being is subject to human senses and, as such, only specific varieties of stimuli are compatible with our sensors[90]; the rest lie beyond the immediate human understanding and can be intuited only indirectly. Given that, the ability of human mind to conceive outer empirical information, henceforth the *human biocomputer*[91], is activated only if compatible stimuli are received by human physiology, thus excluding every other sensational input that is non-recognizable by the respective sensory organs[92]. In that sense, non-observable phenomena reside outside the area of human experience and do not trigger the analyzation of the human biocomputer[93] and, as such, themselves are not directly susceptible to either empirical observation or scientific experimenting[94]. And that is the case, even though non-observable areas may indeed be indirectly elucidated through experiments implemented on the observable areas, because still then theoretical, especially inductive, reasoning – yet not pure empirical understanding – intervenes to bridge the gap of reality that cannot be directly perceived[95].

For example, the spectrum of optical radiation is divided into visible and non-visible areas. The visible area of the solar light constitutes only a small part of the whole area that consists, most of which remains invisible for the perception of human optic capacity[96]. And despite the fact that the non-observable types of radiation, such as ultraviolet rays, are experimentally assessed as

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[90] As such, they are excluded from all possible empirical scope of every human sensor, be it natural or technological.

[91] Concerning the definition and the function of the human mind and brain as an immense biocomputer, see John C. Lilly, M. D., *Programming and Metaprogramming in the Human Biocomputer*, 1972, The Julian Press, Inc., Publishers, New York. For further elaboration, in connection to consciousness as a holographic model, see M. Talbot, *Mysticism and the New Physics*, 1993, Arkana, Penguin Books Ltd, London, p. 37 et. Concerning the human biocomputer in terms of temporal perception, see M. Danezis and S. Theodossiou, *The Cosmology of Cognition* (in Greek), 2003, Diavlos Books, Athens, p. 107-8.

[92] It is worth to point out that, even if future human physiology evolves in Darwinian terms in comparison to the current, still it is presupposed that any physiology, animalistic included, bears an oriented epistemic capacity.

[93] As will be shown hereunder, this principal presupposition springs from indisputable scientific findings. Of course, the corresponding theories may be surpassed by more accurate observations in the future, but it seems rather unlikely that this standpoint would be wholly abandoned and, in any case, until then remains unscathed.

[94] Under the term 'scientific experimenting' is hereby signified the process adhering to the second stage of Galileo's traditional scientific methodology, meaning that, following the position of a hypothesis over a natural phenomenon, an experiment or an observation is carried out, in order to empirically validate or falsify the hypothetical phenomenon. Concerning the partial breach of this methodology, see below.

[95] See also the analysis below concerning the indirect perception over non-observable entities.

[96] M. Danezis and E. Lyratzi, *Introduction to Astral Spectroscopy* (in Greek), 2019, Diavlos Books, Athens, p. 24-27.

existing, this deed is accomplished only by logical reasonings on the experiments implemented on the observable entities, not directly on the non-observable entities.

On the other hand, non-observables are nonetheless still existing natural phenomena and constitute a part of natural reality. That is because the same natural laws that elucidate the observables approve also the existence of the non-observables, as a different – perhaps parallel, but yet non-homogeneous – ontological aspect. And, in spite of the fact that they are not subject to direct human experience, still they are accepted as mathematical displayable entities, coexisting with the observable phenomena. After all, the mathematical models that calculate and infer the existence of non-observables widespread succeed in methodological consistency and deductive precision[97] and, as such, it becomes scientifically compelling to accept that reality bears also non-observable aspects. In that sense, the supposition, according to which existing are only the entities that are empirically verified, comes to an end – or becomes rather surpassed.

For example, the existence of dark matter, being non-luminous, is not founded upon observable findings, but exclusively on mathematical calculations based on the observational properties of the Universe, to explain the virial masses of galaxy clusters; what is more, it is mathematically ascertained that the Universe is probably dominated by unseen dark matter, whose nature is yet to be clarified[98].

In all fairness, it is critical to underline that the existence of non-observable reality can indirectly verified due to its impact on the observable reality[99]. That is, it has a directly conceivable impact on the observable reality and develops secondary properties that are indeed detectable by human physiology. In that sense, human senses can trace it *sideways*, following indirectly its reflection to the known reality – as if the senses function as a mirror to perceive what is hidden of their radius. What is more, given that non-observables can be depicted only mathematically and that only their secondary impact on the observables is analyzable, science strives to mathematically articulate their primary properties through logical induction[100]. Hence, scientific methodology aims

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[97] Concerning the deductive accuracy of mathematical syllogisms, despite being merely theoretical and yet unexplainable, see Eugene Wigner in The Unreasonable Effectiveness of Mathematics in the Natural Sciences in *Communications on Pure and Applied Mathematics,* 13 (1), 1960, pp. 1–14. For further elaboration, see R. Osserman, *Poetry of Universe – A Mathematical Exploration of the Cosmos*, 1995, Anchor Books, Doubleday, New York, p. 142 et., and The Limits of Formalization-Cornelius Castoriadis in dialogue with Alain Connes, in *Postscript on Insignificance-Dialogues with Cornelius Castoriadis*, 2011 [1998], trans. by G. Rockhill and J. V. Garner, Continuum, New York, p. 82 et.

[98] P. Coles and F. Lucchin, Cosmology-The Origin and Evolution of Cosmic Structure, 2002, John Wiley & Sons Ltd, London, p. 91, 110; for further elaboration on the implications of dark matter, see p. 259-262.

[99] When it comes to direct observation concerning sensational perception, it hereto bears the meaning of 'first-person' or 'intentional' stance without further logical analysis, similar to what was asserted by phenomenologists concerning epistemogical issues. In other words, when something is directly observed, its understanding is grounded mainly on the empirical capacity of the human physiology, without or with limited contribution by theoretical reasoning.

[100] After all, already in the beginning of 20th century H. Poincare in *Science and Hypothesis*, 1905, The Walter Scott Publishing CO., New York, p. 176-7, was pointing out the necessity of mathematic induction in physics: "*The method of the physical sciences is based upon the induction which leads us to expect the recurrence of a phenomenon when the circumstances which give rise to it are repeated. If all the circumstances could be simultaneously reproduced, this principle could be fearlessly applied; but this never happens; some of the circumstances will always be missing. Are we absolutely certain that they are unimportant? Evidently not! It may be probable, but it cannot be rigorously certain*" (p.

to extract information that, albeit mathematically and reflectively existing, remains hidden to our senses – or, more accurately, is reserved as an existing potential, *dynamei* according to the Aristotelian terminology.

For example, an electromagnetic field cannot be anticipated on itself, but only in regard to the objects of its environment; its existence is not directly observable, unless we put some metal fillings inside its radius and contemplate on their impact through logical reasoning[101].

Nevertheless, it is critical to point out that deductions based only on secondary properties are not adequate in order to actually understand the true essence of the non-observable natural reality. That is because any experimental attempt or empirical observation either cannot be focused on the non-observable source, the impact of which may be only traced, as a reflection of its body; or it is conducted in the peripheral fringe area of the impacting phenomenon. Such attempt can be equally compared to analyzing a body by its shade[102]: chances are that the shade either deforms the actual body or is moving along with the source of light[103]. Consequently, inasmuch as the observable properties of the non-observable entities remain only secondary, human biocomputer still cannot grasp fully their true nature and only strives to understand them partially[104].

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xxi). "*Induction applied to the physical sciences is always uncertain, because it is based on the belief in a general order of the universe, an order which is external to us*" (p. 17). "*Without the aid of this induction, which in certain respects differs from, but is as fruitful as, physical induction, construction would be powerless to create science*" (p. 20). "*It might be asked, why in physical science generalisation so readily takes the mathematical form. […] It is not only because we have to express numerical laws; it is because the observable phenomenon is due to the superposition of a large number of elementary phenomena which are all similar to each other*" (p. 176-7).

[101] Of course, it could be countered that in the same manner everything is made humanly visible only due to the intervention of light itself, without being non-observable. However, the two examples differ through the following scope: the electromagnetic field itself is not directly observable as existing, unless we assume some theoretical reasoning on its properties, when they are activated by the position of the metal fillings; nonetheless, visible reality originates solely from the 'first-person' or 'intentional' stance and provides direct sensational stimuli without further reasoning needed.

[102] Drawing on the lyric poetry of Greek Antiquity, Pindar, convinced that human nature is ungraspable, expressed in the 8th Pythian (95) the corresponding idea that "σκιᾶς ὄναρ ἄνθρωπος", meaning that human is the shade of a dream – less that either a shade, or a dream. For further elucidation, see P. Lekatsas, *Pindar* (in Greek), 1960, Dirfos Publications, Athens, p. 34-5.

[103] See also E. Danezis, S. Theodosiou, I. Gonidakis, M.S. Dimitrijevic, 'Un-tangible World' and Modern Physics, in *European Journal of Science and Theology*, 2005, vol. 1, No. 4, pp. 11-17 (13-14), where it is asserted that "*we 'see' the ambient not as it is in reality, but as our senses allow us to perceive it*" and, consequently, "*we live in a Universe that we cannot perceive through our senses and what we really see is just a 'shadow' of what really exists*".

[104] To that theme, iconic is the narration by the famous physicist, R. Feynman, in *The Character of Physical Law*, 1967, The MIT Press, Massachusetts, p. 59-60, according to whom scientific praxis on discovering natural laws is compared to a cosmic chess game: "*Suppose that physics, or rather nature, is considered analogous to a great chess game with millions of pieces in it, and we are trying to discover the laws by which the pieces move. The great gods who play this chess play it very rapidly, and it is hard to watch and difficult to see. However, we are catching on to some of the rules, and there are some rules which we can work out which do not require that we watch every move. For instance, suppose there is one bishop only, a red bishop, on the board, then since the bishop moves diagonally and therefore never changes the colour of its square, if we look away for a moment while the gods play and then look back again, we can expect that there will be still a red bishop on the board, maybe in a different place, but on the same colour square. […] If we looked away long enough it could happen that the bishop was captured, a pawn went down to queen, and the god decided that it was better to hold a bishop instead of a queen in the place of that pawn, which happened to be*

As a result, contemporary Physics acknowledge the existence of natural entities that are not directly susceptible to experimentation or empirical observation, but still satisfy the mathematical conditions and are indirectly conceived via theoretical analysis. Nonetheless, as will be shown below, these entities, wholly existing as a part of natural reality, originate strictly within the physical realm and may not be confused with the entities residing withing the metaphysical realm. These are the fundamental characteristics of the indeed non-observable, yet natural, reality.

3.1.2. Origins

Non-observable natural reality originates namely from two sources: on the one hand, as phenomena beyond our cosmological horizon; and on the other hand, as ontological aspects inside our cosmic horizon that are non-conceivable by human sensors. The findings are the same, considering that both areas remain non-tangible by human physiology.

3.1.2.1. Cosmological horizon: The boundary observable and non-observable Universe

Firstly, a cosmological – else, particle – horizon "*represents the longest distance from which we can retrieve information from the past, so it defines the past observable universe*"[105]. Primarily in cosmology, it is attributed with the Hubble radius, based on which this horizon conceptually defines the boundary between particles that, in relation to an observer at one given time, are moving either slower or faster than the speed of light[106]. And as long as vision is only possible due to light itself, which has a high, but still finite, velocity, findings in our telescopes can appear only when the light from the past cosmological events has reached our scoping lenses[107]. In that sense, the observability depends on the question, whether the light generated in open Space has arrived to the Earth-stationed observer, in order to elucidate not only the distance, but also the past of cosmological phenomena[108]. As a result, "*the particle horizon thus divides the set of all points into two classes: those which can, in principle, have been observed by O [the point of the observer]*

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on a black square. Unfortunately, it may well turn out that some of the laws which we see today may not be exactly perfect, but I will tell you about them as we see them at present."

[105] B. Margalef-Bentabol, J. Margalef-Bentabol, J. Cepa, Evolution of the cosmological horizons in a universe with countably infinitely many state equations, in *Journal of Cosmology and Astroparticle Physics*, 2013, no. 2, 015, p. 4.

[106] The scientific requirements of this assertion rely on various properties of general relativity, the expanding universe, and the physics of Big Bang cosmology. For detailed elaboration, see P. Coles and F. Lucchin, pp. 45-7.

[107] The opposite mechanism, attributed not to the past, but to the future, is called 'event horizon' and "*represents the barrier between the future events that can be observed, and those that cannot. It sets up a limit in the future observable universe, since in the future the observer will be able to obtain information only from events which happen inside their event horizon*" (B. Margalef-Bentabol, J. Margalef-Bentabol, J. Cepa, p. 5-6).

[108] M. Danezis and S. Theodossiou, p. 279, 319. Nowadays it is claimed that the cosmological horizon for an observer on Earth extends to 15 billion light years. Despite being immense, especially compared with human measures, still it does not include the whole Universe, a vast part of which is and will continue to be intangible to the human perception.

(inside the horizon), and those which cannot (outside the horizon)"[109]; at a given time, the former is the region defined by the events that have already been observed, while the latter the region that at that same time cannot be observed[110]. As such, the cosmological horizon marks the boundary between the observable and the unobservable regions of the universe[111].

Given the aforementioned assertions, the following distinction is made: when a celestial object travels slower that the speed of light, then it remains inside the Earth's cosmological horizon and, as such, it can still be observed by our sensors; however, when this object attains a velocity faster than the speed of light, then it resides beyond the Earth's cosmological horizon and, thus, becomes non-observable. That is because, due to the expansion of the Universe after the Big Bang, the older the galaxies are, the more distant and accelerating become, thus approaching and at some point surpassing the speed of light[112]; afterwards, they pertain to the non-observable Cosmos and the light they emit cannot reach the observer on Earth.

Therefore, contemporary cosmology infers that the theory of cosmological horizon successfully marks the epistemological boundary, according to which Space is divided between an observable and a non-observable area. Bearing also practical aspects, this standpoint affects practically the research method applied by scientific praxis. That is, aiming to verify a hypothesis, a mathematical calculation is developed, based on which the telescopes would be focusing on or searching for a celestial object in Space. Nonetheless, that sequence is henceforth followed only when the hypothesis is posited for an observable phenomenon inside the cosmological horizon; any other variation is in advance excluded, because it cannot be subjected to empirical observation and, as such, it is acknowledged as non-observable reality.

3.1.2.2. Einstein's Relativity theory: Transcending from 3D to 4D reality

Secondly, under the scope of Relativity Theory by Einstein, widely receiving constant validating acclaim after its enunciation in the beginning of the 20th century[113], natural reality resides in at least four dimensions, despite the fact that human physiology can perceive reality only in three dimensions[114]. Contrary to the classical physics, as illustrated by Newtonian mechanics in the three-dimensioned Euclidean space, Relativity Theory introduced the concept of the four-dimensioned

[109] P. Coles and F. Lucchin, p. 46.
[110] B. Margalef-Bentabol, J. Margalef-Bentabol, J. Cepa, p. 1.
[111] E. R. Harrison, Cosmology-The Science of the Universe, 2000. Cambridge University Press, p. 447.
[112] An example of celestial objects on the brink of observable Universe is the quasars or quasi stars. Being the most ancient galaxies that first sprang from the Big Bang, they are travelling almost at the speed of light in comparison to Earth' s speed and, as such, stand on the edge of our cosmological horizon and on the brink of the observable from Earth Universe. For further elucidation, see M. Danezis and S. Theodossiou, p. 374-5. Concerning their peculiar luminosity and high redshift, see P. Coles and F. Lucchin, p.426-8.
[113] Most recent of these validations were the discovery of gravitational waves in 2015 and the actual depiction of a black hole in 2019.
[114] M. Danezis and S. Theodossiou, p. 91et.

space-time continuum, which links equally the three dimensions of space with the dimension of time and is realizable only if the Universe is structured in four dimensions[115].

As his fundamental supposition, Einstein claimed that gravity is not only attributed to matter, but also curves positively the space around it, thus ascertaining a direct analogous relation between gravity and curvature. Nevertheless, inasmuch as Euclidean geometry bears only zero curvature, it was not compatible to the mathematical space-time of Relativity Theory. As a solution, Einstein applied for his worldview the non-Euclidean geometry of Riemann, which had been already developed in 19th century[116]. The eminent difference is that, whereas Euclidean geometry bears zero curvature, the Riemannian geometry is granted positive curvature; as such, the latter was able to depict mathematically the foundations upon which Relativity Theory emerged[117].

The problem that arises focuses on the fact that human physiology perceives the reality of the space-time only in three dimensions – not in four – and only in zero curvature – not positive. That is because the human biocomputer perceives directly information only when it is displayed in a three-dimensioned Euclidean space. Given that, the Being as depicted by Relativity Theory in Riemannian space is not compatible with the capacity of human senses and, thus, remains non-observable, perhaps even non-imaginable, by the human mind. Therefore, either whatever we sense is an illusion or depicts only a part of natural reality.

A mixture of these options was adopted by Minkowski, who proposed that human physiology receives the stimuli of reality and, despite being in four dimensions and in order to be understood, it is projected in a pseudo-Euclidean space of three dimensions – henceforth named 'Minkowski space'[118]. Specifically put, he claimed that, through the scope of Special Theory of Relativity, human senses function as a distorted mirror, through which 4D reality is a misshapen reflection and appears *mutandis mutandis* as a 3D image[119]. Thus, where as our physiology reflects natural phenomena in an understandable mode, whatever we experience is only a partial appearance of the Being, distorted to be compatible to our bounded empirical perception[120]. Therefore, when

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[115] It must be underlined that the fourth dimension in the Relativity Theory is not time as is humanly perceived, but time as an equal dimension with the other so-called spatial dimensions, which, when combined, formulate the space-time continuum, the dimensions of which are neither temporal, nor spatial, but both at the same time and manner. After all, time as understood by human physiology is not exactly a dimension of reality, but a measurement of physical deterioration; and it is not an equal dimension to the spatial since it is measured according to a different unit. In that sense, reality in four dimensions initially resides beyond the human epistemological capacity. For further elaboration, see M. Danezis and S. Theodossiou, p. 92. Concerning the related debate between Einstein and Bergson, see J. Canales, *The Physicist and the Philosopher – Einstein, Bergson and the debate that changed our understanding of time*, 2015, Princeton University Press, Princeton and Oxford.

[116] For a general elucidation on the geometry of Riemann and other non-Euclidean geometries, see M. Danezis and S. Theodossiou, p. 70et, 81et. For further elaboration on the imaginary worlds of non-Euclidean geometries and curved space, see R. Osserman, p. 63et, 77et.

[117] R. Osserman, p. 79, 136-7, M. Talbot, p. 54, M. Danezis and S. Theodossiou, p. 95, 97.

[118] M. Danezis and S. Theodossiou, p. 260-1.

[119] From a mathematical aspect, this metaphor of the distorted mirror is called 'isomorphism'.

[120] See M. Danezis and S. Theodossiou, p. 92, where is stated that human physiology perceives only a very small area of the non-Euclidean space, which as a result appears as pseudo-Euclidean. Therefore, it is not that classical physics and Euclidean geometry is falsified but is bound to describe validly only a small part of a Riemannian space, separated from the whole reality.

science studies the observable reality, it analyzes what seems as the human representation of it, analogously projected in a humanly understandable version; and of course the rest aspects of reality do exist, but the limited capacity of our sensors renders it intangible[121].

Consequently, it is deduced that, even if Relativity theory asserts that reality resides in four dimensions on a Riemannian space of positive curvature, human physiology understands its Cosmos only in three dimensions, placed in a Euclidean space of zero curvature. Beyond these circumstances, the rest actually existing natural reality cannot be processed directly by the human biocomputer and is reserved only in mathematical illustration, thus anticipated as 'non-observable reality'.

3.2. Traces in the history of ontological philosophy

The concept of 'non-observable reality' has been encrypted in the ontological thought of many acclaimed philosophers of the past, ranging from the early Greek antiquity to late European modernity.

3.2.1. Greek antiquity

3.2.1.1. Epic poetry: Hesiod

During the Archaic period of Greek antiquity, Hesiod, in the beginning of his *Theogony*, meaning 'The Birth of Gods', introduced the entity of *chaos* as the arche of Cosmogony. As stated in the text, "*in the beginning, Chaos came to be and afterwards Gaia the broad-breasted, the everlasting seat for all beings*", while "*from Chaos Erebus and the dark Night came to be*"[122].

That said, Chaos was neither born or derived by some other being, nor existed; it *came to be* on itself, autogenously and *ex nihilo*[123], and, as such, is posited as the primary ontological essence. In terms of meaning, it does not signify disorder or a confused mixture, but more importantly the void which contains nothing but the non-existing[124]. What is more, Hesiod never wonders, what had

[121] M. Danezis and S. Theodossiou, p. 97, M. Talbot, p. 83-4.

[122] Hesiod, *Theogony*, 116-7 and 123.The translations from the original ancient Greek text are my own, while seeking counsel by Hesiod, *Theogony & Works and Days*, 1988, translated with introduction and comments by M. L. West, Oxford University Press, and Hesiod, *Theogony, Works and Days, Testimonia*, 2006, translated and edited by G. W. Most, Harvard University Press. The truth is that both of these sources translate *chaos* as *chasm*, however the latter contains merely literal meaning, whereas the former sustains both a physical and a metaphysical signification. For the lovers of ancient Greek language, the passages of the original text are as follows: "*ἤτοι μὲν πρώτιστα Χάος γένετ'· αὐτὰρ ἔπειτα Γαῖ' εὐρύστερνος, πάντων ἕδος ἀσφαλὲς αἰεὶ*" and "*ἐκ Χάεος δ'Ἔρεβός τε μέλαινά τε Νὺξ ἐγένοντο*".

[123] C. Castoriadis, *What Makes Greece, vol. 1, From Homer to Heraclitus, Seminars 1982-1983* (in Greek), 2007, Kritiki Publications, Athens, p. 265.

[124] C. Castoriadis, False and True Chaos (1993), in *Figures of the Thinkable*, 2005, Electro-Samizdat edition, p. 387. See also C. Castoriadis, The Greek Polis and the Creation of Democracy (1983), in *The Castoriadis Reader*, 1997, translated and edited by David Ames Curtis, Blackwell Publishers Ltd, Oxford, p. 273, and C. Castoriadis, *Seminars 1982-1983*, p. 262.

been existing before Chaos came to be[125], thus acknowledging Chaos as the cosmological arche of the Being. On the contrary, Gaia – meaning Earth – came into existence *afterwards*, while Chaos had already came to be. If understood as the opposite ontological status compared to Chaos, Earth signifies the existing reality[126] that provides living beings with the required for survival stable environment – spatially and temporally.

Concerning the topic of our thesis, we could attempt the following analogy by extracting a germinal cosmological distinction from the archaic mythological figures of Chaos and Gaia. On the one hand, Chaos represents the non-observable natural reality, as it signifies a chasmatic ontological situation, with neither concrete substance, nor any logical consistency. On the other hand, Gaia represents the observable natural reality, as it signifies a consistent ontological situation, which not only is conceivable and knowable, but also serves as the fundamental space-time for every living being respectively. It might also be implied that even Gaia originated from Chaos, because only through the primordial cosmological void everything – even gods – are emerging[127]; and that would analogously dictate that non-observable reality is the primary source of observable reality. From that point of view, it is claimed that Hesiod introduced the dipole between Chaos and Cosmos, the former being the non-definable, along with non-observable, reality, the latter being the order that allows reality to be humanly perceivable. However, in the original text the manner, according to which these entities interact, is not adequately developed.

3.2.1.2. Presocratic era: Anaximander

During the Presocratic era of ancient Greek philosophy, Anaximander[128] was the first who acknowledged that the World that we can know and sense originates from the non-knowable and non-sensible 'apeiron'[129]. Following the mythological 'Chaos' by the epic poet Hesiod[130] and, thus,

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[125] Hesiod, *Theogony, Works and Days, Shield of Heracles, Catalogue of Women* (in Greek), 1941, introduction, translation and comments by P. Lekatsas, Zacharopoulos Publications, Athens, n. 46, p. 104-6.

[126] C. Castoriadis, False Chaos, Chaos and Cosmos (1993, in Greek), in *Anthropology, Politics, Philosophy*, 1993, Ypsilon Books, Athens, p. 100.

[127] C. Castoriadis, *Seminars 1982-1983*, p. 264.

[128] Concerning the problematic that Anaximander – and not Thales – was actually the first original philosopher in the history of human civilization, see G.S. Kirk and J.E.Raven, *The Presocratic Philosophers*, 1971, Cambridge University Press, p.100, C. Kahn, *Anaximander and the origins of Greek cosmology*, 1960, Columbia University Press, New York, p. 6-7, Th. Veikos, *The Presocratics* (in Greek), 1988, Zacharopoulos Publications, Athens, p. 47, 50.

[129] Noticeable is the fact that the sequent to Anaximander Presocratic philosophers did follow more or less the ontological distinction between rationally understandable and non-understandable Being, with contributing fragments stated by Heraclitus (fr. A16), Parmenides (fr. A1, 22), Empedocles (fr. B1) and Democritus (Sextus Empiricus, To physicists VII, 136, 138). Unfortunately, the elucidation of their teachings in terms of the hereto problematic extends beyond the reach of this study. For an indicative exposition, see E. Theodosiou, P. Mantarakis, M.S. Dimitrijevic, V.N. Manimanis, E. Danezis, 'From the infinity (apeiron) of Anaximander in ancient Greece to the theory of infinite Universes in modern cosmology', in *Astronomical and Astrophysical Transactions (AApTr)*, 2010/2011, Vol. 27, Issue 1, pp.162-176 (166-170), and *The Cambridge Dictionary of Philosophy*, 2nd edition, 1999, edited by R. Audi, Cambridge University Press, p. 33-4.

[130] For the relation between the 'Chaos' by Orphic tradition and Hesiod and the 'Apeiron' by Anaximander, see C. Castoriadis, *Seminars 1982-1983*, p. 265-6, 297; contra Th. Veikos, p.52-3.

introducing the next historical stage of Greek ontology, Anaximander identified 'apeiron', literally meaning 'the indefinite'[131], as "*including everything and everything governing*"[132]; for the principal material arche "*is neither water nor any other of the so-called elements, but some other* apeiron *nature, from which come into being all the heavens and the worlds in them; and the source of coming-to-be for existing things is that into which destruction, too, happens according to necessity; for they pay penalty and retribution to each other for any injustice according to the assessment of Time*"[133]. In that sense, inasmuch as 'apeiron' signifies the cosmological arche, for 'apeiron' itself an arche is neither existing, nor needed; that is because, from a spatial, temporal and qualitative aspect, 'apeiron' remains "*immortal and unchanging*", else "*eternal and ageless*"[134], and, as such, is set beyond humanly understandable planes, cast in endless time and unconfined in space[135].

In terms of the hereby project, it is asserted that, based on the Chaos-Cosmos dipole, Anaximander' s fragments elucidates he relation, based on which non-observable reality interacts ontologically with observable reality. From the etymological aspect, the term Apeiron is a synthesis of a-privative and *peras*[136], which means the finite bound in any spatial or temporal context[137]. That being said, Apeiron signifies the boundless Being, which does not entail any finite limits and, as such, is non-definable. What is more, while not being constrainable to neither any determined, nor at least determinable, frame, Apeiron cannot be conceptualized positively, but only negatively. In addition, it not without significance that the word 'peras' is inherent also in the word 'empeiria', which means experience, and the word 'apeiria', which means lack of experience[138]. Specifically put, 'empeiria' is a synthesis which consists of the preposition 'en' – which means 'with' – and the word 'peras'; on the contrary, 'apeiria' consists of a-privative and 'peras'. We can thusly argue that for the ancient Greeks experience is possible only for the part of Being that can be defined in specifiable limits; beyond these, any empirical perception is meaningless[139]. Correspondently, whereas the non-observable phenomena are not delimited to any empirical manner, they cannot be perceived or in any way understood by the experience of the senses.

Under the light of the abovementioned standpoints, it can be claimed that Apeiron implies the existence of non-observable natural phenomena in contradistinction to the observable phenomena, i.e. our Cosmos. That is because, whereas aesthetic experience presupposes ontological

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[131] S. Blackburn, *The Oxford Dictionary of Philosophy*, 1996, Oxford University Press, p. 22.

[132] Aristotle, *Physics*, Book III, 203b, 11.

[133] Simplicius, *On Aristotle's Physics (In Aristotelis Physicorum)*, 1882, Priores Commentaria, Edited by Hermannus Diels, Berolini, Typis et Impensis G. Reimeri, Book IV, 24, p. 13. Else, DK 12, A9 and B1. The original ancient Greek text is as follows: "*λέγει δ' αὐτὴν μήτε ὕδωρ μήτε ἄλλο τι τῶν καλουμένων εἶναι στοιχείων, ἀλλ' ἑτέραν τινὰ φύσιν ἄπειρον, ἐξ ἧς ἅπαντας γίνεσθαι τοὺς οὐρανοὺς καὶ τοὺς ἐν αὐτοῖς κόσμους· ἐξ ὧν δὲ ἡ γένεσίς ἐστι τοῖς οὖσι, καὶ τὴν φθορὰν εἰς ταῦτα γίνεσθαι κατὰ τὸ χρεών· διδόναι γὰρ αὐτὰ δίκην καὶ τίσιν ἀλλήλοις τῆς ἀδικίας κατὰ τὴν τοῦ χρόνου τάξιν*". The translation hereto adopted is by G.S. Kirk and J.E.Raven, p. 106-7.

[134] For an extended elaboration, see G.S. Kirk and J.E.Raven, p. 114-117.

[135] G.S. Kirk and J.E.Raven, p. 108-110, Th. Veikos, p.53-4.

[136] I. Stamatakos, *Lexicon of the Ancient Greek Language* (in Greek), 1972, Phoenix Publications, Athens, p. 148.

[137] E. Theodosiou, P. Mantarakis, M.S. Dimitrijevic, V.N. Manimanis, E. Danezis, p. 163

[138] I. Stamatakos, p. 148 and 332.

[139] C. Castoriadis, *Seminars 1982-1983*, p. 266-7, 284. It is to be underlined that, according to Castoriadis, 'apeiron' does not mean merely boundless, but radically non-definable.

boundaries, Apeiron is by definition boundless. Consequently, the latter is not susceptible to empirical perception, thus sharing the most iconic characteristic of non-observable entities. In terms of analysis, this conclusion does not differ greatly from the cosmogony as illustrated by Hesiod, with the exception that this time it constitutes the first ever philosophical passage that theorizes the precedent mythological-religious tradition[140].

Nevertheless, the inspiration from Anaximander does not halt there. Concerning the interaction between non-observable and observable reality, inasmuch as Apeiron stands for the cosmological arche, then it signifies also the source of our observable Cosmos. To wit, if Apeiron depicts the primary state of Being, then the observable Cosmos is acknowledged as the secondary ontological reflection of reality. In other words, based on Anaximander it can be asserted that observable phenomena are not only derived from, but also caused by non-observable phenomena. That is because Apeiron, the realm beyond the empirical experience, is transcended as the fundamental beginning of any causal sequence, beyond any scientific comprehension, from which all the rest are extracted – else, created[141]. In that sense, it could be assumed that, if Apeiron is the ontological rule of existing Being, then the observable Cosmos is just an aspect of it or, rather surprisingly, just an ontological exception, a limited slice of Being in comparison to the wider picture of the unreachable, but still dominating Universe.

3.2.2. European Modernity

3.2.2.1. Kant: 'Dingen an sich' and 'noumena'

When the era of European Modernity begun, philosophy, under the groundbreaking work namely by Descartes, Spinoza and Leibniz, was widely founded on deterministic rationalism and, as a result, it was against its methodological framework to assert the existence of chaotic – else, non-observable – phenomena[142]. For, contrary to the religious idealism that dominated the European thought during the medieval ages, mainly by Scholasticism, it was primarily the scientific methodology by Galileo that posited the epistemological projects towards understanding the Being. Nonetheless, the English thinkers following Hobbes were rather early and thoroughly debating over empiricism, with Locke, Berkeley and, of course, Hume being the main combatants[143].

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[140] Familiar to that viewpoint is the historically subsequent allegory of the cave, manifested by Plato during the classic period of Greek antiquity, wherein material substance is projected as shadows that are springing from the fire of Truth, which is non-tangible by any means, thus rendered non-observable by empirical knowledge (*Republic*, 514a–520a).

[141] Concerning the creation of material existence from Apeiron, notable is the interpretation by C. Castoriadis based on the dipole of *ivris* and *dike* - else, injustice and retribution – in *Seminars 1982-1983*, p. 295, 298-9. Inasmuch as the Being is extracted from the cosmogonic Aperion, its material existence is in itself an injustice, the retribution for which is its own decay. In that sense, Castoriadis suggested that Apeiron of Anaximander activates some kind of ontological justice: existence commits the crime of distinguishing itself from Apeiron and for that reason is punished by death.

[142] C. Castoriadis, *Seminars 1982-1983*, p. 280.

[143] For the historical background that preceded the philosophy of Kant, see W. Durant, *The Story of Philosophy*, 2nd edition, 1933, Garden City Publishing Co., New York, p. 276-285.

In this historical context and under these philosophical origins, it was Immanuel Kant and his late period of the three Critiques that emerged as a breakthrough to his contemporary philosophical discussions. Especially concerning non-observable natural reality, Kant, attempting to forge his doctrine of transcendental idealism as illustrated in the Critique of Pure Reason and henceforth, implied an ontological area that remained outside the cognitive capacity of human beings.

Specifically put, the first fundamental distinction is addressed between mere appearances ('*Erscheinungen*') and things in themselves ('*Dingen an sich*'). As Kant himself acknowledged, "*we indeed, rightly considering objects of sense as mere appearances, confess thereby that they are based upon a thing in itself, though we know not this thing in its internal constitution, but only know its appearances, viz., the way in which our senses are affected by this unknown something. The understanding therefore, by assuming appearances, grants the existence of things in themselves also, and so far we may say, that the representation of such things as form the basis of phenomena, consequently of mere creations of the understanding, is not only admissible, but unavoidable*"[144]. Given this presupposition, Kant approved of a compulsory dichotomy to the nature of objects. On the one hand, their appearances bear the ontological aspect that is subject to human senses and, as such, is cognizable and understandable; on the other hand, things in themselves constitute their inner existential source and address a parallel aspect that, despite forming the basis of empirically knowable phenomena, remains unknowable and can be only approached deficiently via its projections as appearances.

In terms of space as a scientific notion, Kant deduced that "*absolutely nothing that is intuited in space is a thing in itself, and that space is not a form that is proper to anything in itself, but rather that objects in themselves are not known to us at all, and that what we call outer objects are nothing other than mere representations of our sensibility, whose form is space, but whose true correlate, i.e., the thing in itself, is not and cannot be cognized through them, but is also never asked after in experience*"[145]. Concerning time as a scientific notion, Kant accordingly asserted that time "*is only of objective validity in regard to appearances, because these are already things that we take as objects of our senses; but it is no longer objective if one abstracts from the sensibility of our intuition, thus from that kind of representation that is peculiar to us, and speaks of things in general*" [146]. Therefore, the empirical reality of time is regarded only as "*a subjective condition of our (human) intuition (which is always sensible, i.e., insofar as we are affected by objects), and in itself, outside the subject, is nothing*"[147], because "*since our intuition is always sensible, no object can ever be given to us in experience that would not belong under the condition of time*"[148]; on the contrary, inasmuch as "*such properties, which pertain to things in themselves, can never be given to us through the senses […]* ", time under its transcendental ideality "*is nothing at all if one abstracts*

[144] Kant, *Prolegomena to any future metaphysics*, 1912, ed. and trans. by Dr. P. Carus, The Open Court Publishing Company, Chicago, § 32, p. 75

[145] Kant, *Critique of Pure Reason*, 1998, Cambridge University Press, Cambridge, henceforth designated as 'C.P.R.', A30/B45, p. 161-2.

[146] C.P.R. A35/B52, p. 164.

[147] C.P.R. A35/B52, p. 164.

[148] C.P.R. A36/B53, p. 164.

from the subjective conditions of sensible intuition and cannot be counted as either subsisting or inhering in the objects in themselves (without their relation to our intuition)"[149]. Consequently, both space and time "*apply to objects only so far as they are considered as appearances, but do not present things in themselves*", because, the latter excluded, only the former "*alone are the field of their validity, beyond which no further objective use of them takes place*"; however, "*this reality of space and time, further, leaves the certainty of experiential cognition untouched: for we are just as certain of that whether these forms necessarily adhere to the things in themselves or only to our intuition of these things*"[150]. Under the light of these standpoints, Kant forged transcendental idealism of all appearances as "*the doctrine that they are all together to be regarded as mere representations and not as things in themselves, and accordingly that space and time are only sensible forms of our intuition, but not determinations given for themselves or conditions of objects as things in themselves*"[151].

So far, what is critical for the herein topic is the deduction that things in themselves by Kant reside beyond space and time, that is to say beyond the human realm of their projected appearances. Thus being non-definable through empirical manner, they exist as non-susceptible to scientific knowledge or logical understanding. What is more, things in themselves, albeit non-observable in any manner, constitute the source – else, the arche – of their observable appearances – as the 'Chaos' by Hesiod and 'Apeiron' by Anaximander constitutes the cosmological arche, from which the observable Cosmos originates.

The second fundamental distinction addressed by Kant stands between *phaenomena* and *noumena*. On the one hand, phenomena constitute an especial ensemble of appearances that "*are thought in accordance with the unity of the categories*"[152] and, as appearances drawn by empirical intuition, are determined by the combination of sensibility and understanding[153] and bear their limitations. In addition, while subject to Kantian categories, *phaenomena* become subject to causality as pure category. As a result, only through empirical intuition the objective validity of phaenomena becomes possible[154].

On the other hand, the definition of *noumena* differs noticeably between the first and the second edition of the Critique, while their role triggers fiercely the ontological problematic. In the first edition, *noumena* – else, *intelligibilia* – are acknowledged as things that "*are merely objects of the understanding and that, nevertheless, can be given to an intuition, although not a sensible intuition*"[155]. In terms of the manner *noumena* are given to human cognition, Kant's first edition posits that, "*if the senses merely represent something to us as it appears, then this something must also be in itself a thing, and an object of a non-sensible intuition, i.e., of the understanding, i.e., a cognition must be possible in which no sensibility is encountered, and which alone has absolutely objective reality, through which, namely, objects are represented to us as they are, in contrast to the*

[149] C.P.R. A36/B53, p. 164.
[150] C.P.R. A39/B56, p. 166.
[151] C.P.R. A369, p. 426.
[152] C.P.R. A249, p. 347.
[153] C.P.R. A258/B314, p. 352.
[154] C.P.R. A239/B298, p. 340-1.
[155] C.P.R. A249, p. 347.

empirical use of our understanding, in which things are only cognized as they appear"; according to that supposition, "*there would be, in addition to the empirical use of the categories (which is limited to sensible conditions), a pure and yet objectively valid one*", through the scope of which "*an entirely different field would stand open before us, as it were a world thought in spirit (perhaps also even intuited), which could not less but even more nobly occupy our understanding*"[156]. Of course, Kant understood that a *noumenon* is epistemologically regarded as "*rather something that can serve only as a correlate of the unity of apperception for the unity of the manifold in sensible intuition*"[157] and, thusly, "*does not signify a determinate cognition of any sort of thing, but rather only the thinking of something in general, in which I abstract from all form of sensible intuition*"[158]; nevertheless, "*in order for a* noumenon *to signify a true object, to be distinguished from all phenomena, it is not enough that I liberate my thoughts from all conditions of sensible intuition, but I must in addition have ground to assume another kind of intuition than this sensible one, under which such an object could be given*"[159]. After all, Kant admitted – and this becomes most elucidating – that his analysis insofar was "*able to prove not that sensible intuition is the only possible intuition, but rather that it is the only one possible* ***for us****; but we also could not prove that yet another kind of intuition is possible*"[160].

That being said, Kant distinctly stated that, even if *noumena* are independent of sensibility, they still exist as subject to some other kind of non-sensible intuition. To that end, the philosopher daringly made the claim that, despite the fact that an object of a non-sensible intuition remains beyond the reach of sensibility, still it constitutes a rather objective reality. What is more, this newly-emerged ontological realm would be freed from the boundaries of empirical intuition and would be explored by the intellectual intuition, without that being an underestimation of its ontological objectivity. And that would be valid, even if *noumena* were not subject to pure categories, thus rendered neither verifiable, nor falsified by the laws of causality.

In the second edition, Kant appeared reluctant to fully fertilize this line of thoughts and withdrew some of his previous bold statements, suggesting *noumena* only as "*objects thought merely through the understanding, either other objects conceived in accordance with the latter constitution, even though we do not intuit it in them, or else other possible things, which are not objects of our senses at all, and call these beings of understanding*"[161]. Furthermore, Kant not only did not explicitly introduce again the notion of a possible non-sensible intuition, but also removed most of the passages concerning the cognizability of *noumena* and instead he focused primarily on their positive and negative meaning. Specifically put, Kant claimed primarily that "*if by a noumenon we understand a* ***thing insofar as it is not an object of our sensible intuition****, because we abstract from the manner of our intuition of it, then this is a noumenon in the* ***negative*** *sense*"[162]; that is because "*since such an intuition, namely intellectual intuition, lies absolutely outside our*

[156] All passages are drawn by C.P.R. A250, p. 347.
[157] C.P.R. A251, p. 348.
[158] C.P.R. A252, p. 348-9.
[159] C.P.R. A252, p. 349.
[160] C.P.R. A252, p. 349.
[161] C.P.R. B306, p. 360.
[162] C.P.R. B307, p. 360.

faculty of cognition, the use of the categories can by no means reach beyond the boundaries of the objects of experience; and although beings of understanding certainly correspond to the beings of sense, and there may even be beings of understanding to which our sensible faculty of intuition has no relation at all, our concepts of understanding, as mere forms of thought for our sensible intuition, do not reach these in the least; thus that which we call noumenon must be understood to be such only in a ***negative*** *sense*"[163]. On the contrary, "*if we understand by that an* ***object of a non-sensible intuition****, then we assume a special kind of intuition, namely intellectual intuition, which, however, is not our own, and the possibility of which we cannot understand, and this would be the noumenon in a* ***positive*** *sense*"[164]; "*if, therefore, we wanted to apply the categories to objects that are not considered as appearances, then we would have to ground them on an intuition other than the sensible one, and then the object would be a noumenon in a positive sense*"[165].

Under these statements, it is made clear that Kant practically abandoned the notion of *noumena* in a positive sense, because its ascertainement resides beyond the cognitive capacity of the human empirical intuition. Thus, *noumena* were primarily acknowledged in their negative sense and their epistemological contribution was limited only to outlining the boundaries of the sensibility. That same conclusion springs also from the common grounds of the two editions: even if "*one cannot assert of sensibility that it is the only possible kind of intuition*", the concept of *noumenon* "*is necessary in order not to extend sensible intuition to things in themselves, and thus to limit the objective validity of sensible cognition*"; after all, inasmuch as "*we have no insight into the possibility of such noumena, and the domain outside of the sphere of appearances is empty (for us) […] the concept of a noumenon is therefore merely a* ***boundary concept****, in order to limit the pretension of sensibility, and therefore only of negative use*", "*without being able to posit anything positive outside of the domain [of sensibility]*"[166].

In terms of the terminology of our project, *noumena* may correspondently stand for the non-observable natural phenomena, which are represented in total abstraction, because they are not subject to human biocomputer and, thus, do not produce any acceptable empirical input for our empirical intuition. In that sense, inasmuch as non-observable reality could not be determined or even acknowledged in the era of Kant, *noumena* only signified the limits of human cognition, but not a parallel existing natural realm. However, it would not be an exaggeration to claim that non-observable natural reality could at least be thought of or even distinctly implied by Kant, but still never openly admitted.

3.2.2.2. Poincare: Relations among scientific objects

Deeply influenced by the Kantian principles, Henri Poincare represented a combination of conventionalism and relationism in the philosophy of science during the late period of Modernity.

[163] C.P.R. B309, p. 361.
[164] C.P.R. B307, p. 360-1.
[165] C.P.R. B309, p. 361.
[166] All passages are drawn by C.P.R. A255/B311, p. 362.

Concerning the concept of things in themselves, Poincare radicalized relationistically its epistemological scope, claiming that "*the aim of science is not things themselves, as the dogmatists in their simplicity imagine, but the relations between things; outside those relations there is no reality knowable*"[167]. In that sense, an alternative distinction is implied in order to differentiate the nature of things as external objects from the relations among these objects[168]. Holding to this distinction as his principal ontological standpoint, in terms of grasping scientific knowledge Poincare denied that reality outside relations, albeit in all respects existing, is knowable under any extent or manner[169].

Poincare stressed further on that relationist point while wondering on the objective value of science. After asserting that any scientific objectivity is grounded only upon the relations among things, he continued in his fierce agnostic tone: "*not only science cannot teach us the nature of things; but nothing is capable of teaching it to us, and if any god knew it, he could not find words to express it. Not only can we not divine the response, but if it were given to us we could understand nothing of it; I ask myself even whether we really understand the question*"[170]. It is exactly the reference to godlike omniscience that permits the conclusion, that the suggested epistemological boundaries are due to human physiology itself; thus, whatever resides beyond the realm of relations demands a broader epistemological capacity that surpasses the faculty of the human biocomputer – else, "*an intellectual intuition which we humans lack*"[171].

Therefore, the primary object of scientific praxis remains not the intrinsic nature of Being itself, but only the relations among its objects. What is more, in reflection to Kantian terminology, Poincare's arguments correspondently concluded that not only the things in themselves as the ontological substance ("*Dingen as sich*"), but even their projected appearances ("*Erscheinungen*") are not subject to scientific understanding; on the contrary, exclusively the relations among the appearances of the things in themselves remain the only possible field for human sensibility to access the external world.

Lastly, concerning the topic of the herein study, it is addressed that the scientific relations among objects of natural reality are the only observable phenomena by humans, rendering thus the rest as non-knowable and, as such, subsuming them to the field of non-observable natural reality. In that sense, from Poincare's relationism can be extracted firstly that scientific praxis of the whole scientific Cosmos extends only to the limited area of relations among scientific objects; secondly,

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[167] Poincare, *Science and Hypothesis*, 1905, The Walter Scott Publishing CO., New York, p. xix.

[168] For the correspondence of things themselves by Poincare with the things in themselves by Kant, in order to signify the intrinsic nature of external objects, see S. Psillos, Conventions and Relations in Poincare's Philosophy of Science, in *Methode-Analytic Perspectives*, 2014, Issue 4, p. 125-6, where it is claimed that "*Poincaré's motivation is Kantian*" and that "*it is quite clear that he [Poincare] wanted to draw a distinction between how things are – what their nature is – and how they are related to each other*", according to which "*the former are unknowable, whereas the latter are knowable*"; nevertheless, it is also confessed that "*there is no detailed discussion of these issues in Poincaré's writings*".

[169] S. Psillos, Conventions and Relations in Poincare's Philosophy of Science, p. 125.

[170] Poincare, The Value of Science, in *The Foundations of Science*, 1921, The Science Press, New York, p. 350.

[171] S. Psillos, Conventions and Relations in Poincare's Philosophy of Science, p. 126.

that the scientifically observable area, i.e. relations, is not the cause, but just the result of a non-observable arche.

3.3. Drawing ontological questions from non-observables: The impact on scientific knowledge

Acknowledging non-observable natural reality as an independent ontological stratum is not without a considerable impact on human understanding. Roughly outlined, the empirical capacity, provided by human physiology, is proven to have distinct limitations on perceiving scientifically the Cosmos; that is because the existing natural reality originates not only from perceivable, but also from non-perceivable natural phenomena.

The theoretical and methodological impact can be indicatively summarized as follows.

3.3.1. Surpassing empiricism

From an academically philosophical point of view, the acknowledgement of non-observable natural reality banishes empiricism as an autonomously consistent ontological approach. That is because, contrary to the empiricist claim, any knowledge through the senses ('*empeiria*') may perceive only an aspect of reality, but not its whole actual essence.

Especially concerning the philosophy of science, verificationism and other empiricist theories had already received criticism, because a vast, unexplored area of the Being was thusly ignored by scientific research[172]. While ascertaining non-perceivable natural phenomena, the methodological tendency to apply direct experimentation for any scientific hypothesis retains of course its significance, though it is deprived of its supremacy towards elucidating entirely the natural reality. In that sense, it is not that empiricism is abandoned without question; nonetheless, it is ascertained that singularly it can identify not the whole, but only a part of the problem, while it can provide not absolute, but only partial answers. There will always be something more in any ontological analysis that, if graspable at all, cannot be grasped only by human *empeiria*.

3.3.2. Breach in traditional scientific methodology

The abovementioned affirmations fragment the principles of traditional scientific methodology, as primarily introduced by Galileo during the Renaissance and the great scientists henceforth.

Specifically put, scientific procedure was divided in three stages: firstly, a hypothesis over a natural phenomenon is posited; secondly, an experiment or an observation is carried out, in order to

[172] See the introduction (p. xvii-xviii) and the first chapter (p. 2-6) by S. Psillos, *Scientific realism – How science tracks truth*. See also Talbot, p. 3, according to whom empiricism presupposes "*a dispassionate observer and concentrated upon objective reality as a single, observable 'something'* a priori *to the consciousness*".

empirically validate or falsify the hypothetical phenomenon; and, lastly, a conclusion is drawn under the ascertainment, whether the experimental data adhere to the primary hypothesis. This methodology was a critical milestone by Galileo towards the scientific revolution of his era and has been indeed fundamental for every scientific development henceforth. What is more, it is significant to point out that the ontological presupposition of Galileo's methodology is the assumption that the existing natural reality is observable by human senses and can be calculated according to empirical findings. In that sense, 'natural' was identified only as 'sensible' and the conceptualization of reality was correlated mainly with empirical observation[173].

However, while non-observable reality is being widespread addressed as a parallel entity, traditional scientific praxis is confronted with a breach in its consistency. As asserted above, non-observables are subjected neither to usual experimentation nor to empirical observation; that is because, insofar as experimental data are extracted only from the observable dimension of reality, they provide only empirically perceivable input, which on themselves may illuminate either directly the observable entities or indirectly the non-observable entities through their observable properties[174]. However, both cases deny a direct view over the actual body of the non-observable Cosmos, which is thusly approached and deemed as existing only through theoretical and mathematical reasoning, based on and in accordance with the observable experimental findings[175]. Thus considered, whereas empirical experiments and observations are dominated by the epistemological limitations of human physiology, the mathematical depictions of non-observable reality cannot be directly tested and, hence, remain as a principle empirically neither affirmable, nor falsifiable. Therefore, the contribution provided by experimental data is focused exclusively on the possible secondary properties of non-observable entities, as reflected on experimentally ascertained observable phenomena that embody some of their humanly perceivable properties.

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[173] M. Danezis and S. Theodossiou, p. 42-3, where it is demonstrated that the traditionally regarded as common logic accepts as "real" only the observable Cosmos through the human empirical senses, while at the same time any observer is asserted as independent from and unaffected by the observed natural phenomena. Regarding the determinism on causal relations by classical physics in comparison to the indeterminism by contemporary physics, which result in deductions contrary to human experience, see Talbot. p. 15-24.

[174] For that topic, see also M. Massimi, Saving Unobservable Phenomena, in *The British Journal for the Philosophy of Science*, Vol. 58, No. 2, June 2007, p. 239, where is stated that "*data must occur in the form of records of occurrences that are accessible to our sensory apparatus*", meaning drawn only through observable entities; in that sense, "*data are records that are visually detectable*", whereas on the contrary "*phenomena do not necessarily have to occur in a form that is accessible to our perception*", meaning that they may exist as non-observable entities. Besides, this previous paper is based on the suppositions of J. Bogen and J. Woodward, Saving the Phenomena, in *The Philosophical Review*, Vol. 97, No. 3, July 1988, p. 350, according to whom "*for the most part, phenomena cannot be perceived and, in many cases, the justification of claims about the existence of phenomena does not turn, to any great extent, on facts about the operation of the human perceptual system*".

[175] According to M. Massimi, "*evidence for unobservable phenomena comes from data that have been selected, regimented, and laboriously organized in a data model*" (p. 240), the latter being an iconic product of theoretical reasoning; as such, "*in current scientific practice, experimental data provide evidence for phenomena, which may not necessarily be visually accessible, but may nevertheless be detected by selecting and laboriously constructing data in a data model, whose output is then 'saved' by a suitable theoretical model*" (p. 241). That is the reason why "*even if the data are observable […], this does not imply that the output of a data model should be itself observable too*", insofar as "*often in science there is a fairly long chain between data and the final parameter that the data model is meant to measure*" (p. 246).

Consequently, it becomes rather apparent that the identity between 'natural entity' and 'empirical perception' is not directly applicable in a vast field of natural reality. Thus, inasmuch as the conceptualization of reality is correlated with empirical observation only secondarily, any research attempt over non-observable natural reality essentially is destined to partially omit the second stage of Galileo's traditional methodology. Of course, the essentiality of the latter cannot be degraded, but still its absolute supremacy has to be dethroned.

3.3.3. The arche and the limits of causality

Fundamentally, strict causality is the basic methodological tool upon which scientific analysis lays its findings. That is because causal sequences, supported via mathematical reasoning, illustrate the properties of and the interactions among natural phenomena. Nonetheless, causal reasoning alone does not provide adequate evidence concerning the existence of natural entities; besides, this is the reason, why empirical experimentation or observations must be implemented, in order to testify the mathematical calculations that formulate a scientific hypothesis. In that sense, causal sequences in science are considered to be depending on empirical validation or falsification; to the extent that its sequences are validated, in that same extent causality is gratified. Being that amiss, mathematic causality provides mere theoretical syllogisms, among which logical coherence is indeed maintained, but cannot still be reflected on natural phenomena.

Insofar as to the latter case adheres wholly to natural reality, the same problematic arises concerning non-observable natural phenomena. As stated above, non-observables are only mathematically depicted, while their existence is not empirically evident. That said, causal sequences that highlight the existence of non-observable entities cannot be directly validated and, consequently, their logical origins cannot be directly gratified. In that sense, non-observables are of course subject to mathematical reasoning, which nevertheless resides beyond the scope of scientifically testable causal sequences. Given that, it is arguable to suggest that non-observable natural reality marks the limits of formal causality, beyond which mathematical sequences remain only theoretical, but never applicable to perceivable natural reality. However, that could not imply that non-observables are metaphysical entities; the problematic stands precisely on the scientific fact that they are physical, yet non-subject to empirical understanding.

Let us elaborate through an example, drawn from the theory of cosmological horizon. When the sun is setting in the west, it can be assessed that it is rising on the east. Nonetheless, we can push forward and wonder why the sun rises from the east. Of course, that is explained by the position of the sun in comparison to the position of the Earth. But then we are still tempted to ask, why these positions have been chosen. Attempting to answer further, we can claim that the force of gravity, via its gravitational waves, is laying the landscape of our solar system, along with our galaxy. If we still ask onwards, at some point we will finally stumble across an initial causal condition – else, an arche; and especially concerning the typical cosmological theory of our time, this arche is marked by the theory of the Big Bang. Now, the critical question arises: albeit anticipated as the beginning of the Universe, can we proceed further than the Big Bang? And, even if phenomena before the Big

Bang come to pass, can we really claim that through scientific causality we may reach the bottom of the cosmological genesis?

The answer hereby accepted is negative. Scientists have already been suggesting that the observable and reachable Cosmos inside the Earth's cosmological and event horizon correspondently mark the boundaries of causality – at least concerning the humanly reachable causal connections; in that sense, beyond the known Cosmos, non-observable entities are causally 'disconnected' from the rest of the Universe. That is because in the end the causal roots for any set of logical sequences are embedded deep into the non-observable layer of the Being and, as such, the cosmological arche seems hidden to the direct perception of human physiology[176]. Be that as it may, if the arche of causality originates from the non-observable reality, still itself is not susceptible to empirical understanding[177].

Consequently, as a directly applicable methodological tool, causality is exhausted only in the field of observable phenomena, in which we can indeed lay claims for causal analysis. On the contrary, non-observable phenomena, being not subject to direct experimental validation, are not subject to gratifiable causal sequences and, thus, are excluded from the scope of strict causal logic.

3.3.4. From scientific hypotheses to ontological presuppositions

In all fairness, the fact that non-observable natural reality was completely ignored by traditional methodology is not entirely the case. This is because from the birth of science any scientific hypothesis has been suggesting of a non-directly-observable natural phenomenon, either based on the mathematics applied or imposed by the imagination of the researcher. And, under the spirit of determinism, that hypothesis was considered to be directly verifiable by the respective scientific methodology.

Nowadays the essentially different approach stands on the fact that back then a non-observable entity merely posited the hypothetical question and awaited in the future its possible verification[178]; however, according to contemporary Physics, that same hypothesis may be regarded as a given, else an ontological presupposition, despite the fact that its empirical verification stands on a loose end[179]. Insofar as non-observable reality constitutes a part of natural reality – and not a

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[176] After all, this is precisely the scientific standpoint that historically originates from the concept of 'chaos' by Hesiod, 'apeiron' by Anaximander, 'noumena' by Kant and 'relations' by Poincare, as illustrated above.

[177] Concerning the independence of causal relationships from direct observation, see Talbot, p. 17-8.

[178] It is worth to mention that, when criticising deterministic viewpoints in scientific praxis, which would always promise that tomorrow the unknown would or could be revealed as known, Castoriadis was often sardonically referring to the French joke about the barber who places a sign in his window announcing 'Free Shaves Tomorrow'; and when a customer who has seen the sign comes in the next day for his free shave, he is told by the barber at the end of the shave that he must pay, for it is not until 'tomorrow' (that is, never) that free shaves will be given! See The Logic of Magmas and the Question of Autonomy, 1983, in *The Castoriadis reader*, p. 303, n. 14, p. 317, and False Chaos, Chaos and Cosmos, p. 97-8.

[179] Of course, this point should not lead to the manifestation of arbitrariness in science, that "*anything goes*" as illustrated by P. Feyerabend and his theory of methodological anarchism. On the contrary, which of the non-observable entities may or may not constitute an ontological presupposition is rather non-arbitrary, because it depends on its consistent association with their observable counterpart. And while this problematic is worthy of

metaphysical entity, even without being subject to direct experience –, it becomes a parameter of ontological analysis, equivalently along with the observable reality. To that end, in order to deduce a scientific calculation, observable and non-observable entities have to coexist as mathematical parameters of the same equation – as either factors or even constants; and albeit their coexistence, their natural characteristics are rather distinct, rendering thus the equation radically non-homogeneous. In that sense, regardless of their actual validity, non-observable entities surpass the state of a mere suggested hypothesis and can acquire the state of an ontological presupposition, a given standpoint that must be taken into account for further scientific discoveries; as such, in terms of analytical significance non-observable elements are roughly equated with observable ones.

3.4. Concluding remarks: The path from non-observables to imagination

To sum up, it has been hereby attempted to pinpoint the scientific object and acknowledge the epistemological impact of non-observable natural reality on the limits of scientific knowledge. Given the aforementioned elaborated standpoints, we can thusly address again and now roughly answer the triggering questions posited in the introduction: inasmuch as the epistemological capacity of human physiology is exhausted only to a finite limit, it excludes a vast area of natural reality as directly non-observable, meaning that a part of our Cosmos can never be adequately known, thus remaining humanly non-tangible; as such, the boundaries of human understanding are marked by non-observable reality, on the field of which phenomena can be empirically neither affirmed, nor falsified via direct experimentation; and, consequently, the arche of any scientific sequence is non-observable, thus rendering its mathematical analysis causally incomplete.

This intriguing thought lies with the fact that scientific statements are still remaining fully applicable, but cannot explain by themselves the foundations of their own applicability – at least, not with the methodology they adopt for their structure. This link between the applicability and the essential incompleteness demands an approach beyond the traditional methods in philosophy of science, in order for scientific sequences to at least appear as *quasi-complete* and support the rest whole structure of scientific discovery. Therefore, it is critical to underline that the acknowledgement of non-observable reality, albeit ignored by the human biocomputer, still does not exhaust our scope only upon observable phenomena; on the contrary, it does reveal uncharted realms beyond common empirical sense, awaiting future exploration. And, of course, given that non-traditional methods of understanding are to be mustered, it is time for metaphysics and human imagination to be called to arms.

In the hereby thesis, it is argued and below discussed that, in order for scientific statements to become at least quasi-complete, imagination as the vessel of metaphysics comes to play in the

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deeper elaboration, which unfortunately exceeds the aims of the hereby study, still it must be pointed out that presuppositions that originate from the non-observable reality are evaluated according to their convenience with the experimental findings drawn from the observable reality; as such, they are either adopted as scientific axioms or condemned as misguided hypotheses or pseudoscience.

attempt to straddle on the chaotic area and substitute the missing, empirically unknowable scientific primaries with axioms that serve as scientific presuppositions. In other words, the fundamental scientific arche is neither empirically deduced, nor logically determined, but imaginarily posited or even instituted – meaning that it resides beyond our observable Cosmos and, as such, can be grasped only as an image, as a product of human intellect. And this substitution of the unknown by imagination, albeit dangerously unstable, still illuminates the dark origins of scientific logic at least in a convenient manner, possibly capable of withstanding the demands of scientific praxis towards further evolution.

Of course, it must be underlined that non-observable reality is not in itself metaphysical, but strictly physical. The only distinguishing point lies with the fact that, despite being subject to mathematical inference, still cannot be empirically perceived through direct observation, contrary to the traditionally regarded as scientific object; however, only its projection depends on metaphysical means, while retaining its material existence. That being the case, whereas non-observable phenomena open the door for metaphysics and imagination, their nature remains strictly physical.

Following these standpoints, when rational methods are rendered ineffective, imagination under specific circumstances bears the capacity to formulate the Being that is not accessible by the human senses; that being said, imagination may surpass the boundaries that disable the assets of traditional scientific methodology and provide the essential consistence for the foundations of scientific knowledge. To that end, the topics to be further discussed are, firstly, the concept of creative and social imagination by Cornelius Castoriadis and, secondly, the traditional approach of imagination by the history of philosophy.

4. *Creative and social imaginary: Radicalizing imagination by Cornelius Castoriadis*

4.1. General definition

The concept of imagination consists of the core of Castoriadis' ontological theory, bearing as fundamental characteristics a radically creative and a social aspect.

In general, **imaginary** is "*something invented – whether this refers to a 'sheer' invention […] or a slippage, a shift of meaning in which available symbols are invested with other significations than their 'normal' or canonical significations*"; thus, the imaginary is separate from the real and uses the symbolic "*not only to 'express' itself […], but also to 'exist'*"[180]. It is worth to underline that the concept of image is understood not just as a visualized representation of reality, but in the most general sense of a form or a figure[181]. At the same time, however, imaginary is distinguished from pure fantasy, an illusion; for due to the evolution of human societies, imaginary possesses "*a greater reality than the real itself*"[182].

Among others[183], the historical sequence of imagination is roughly depicted by Castoriadis' own words as follows: "*The history of the imagination of the psyche […] begins with Aristotle, in* De Anima*, where the Philosopher discovers two imaginations, but at the same time wavers. It continues in the Stoics and Damascius, receives a broad development in Great Britain, by Hobbes and Coleridge. It reaches its pinnacle with the anew discovery of imagination by Kant, in the first edition of the* Critique of Pure Reason*, and the drastic reduction of its role in the second edition, its noteworthy restoration by Fichte, its unbelievable degradation to a variation of memory by the late Hegel, the rediscovery of the Kantian discovery and its consequent abandonment by Heidegger in the* Kantbuch *(1927), but still the complete silence of Heidegger on the subject afterwards, the hesitations of Merleau-Ponty in* The Visible and the Invisible *concerning the position of the "real" and the "imaginary"; not to mention Freud […], who accomplishes the feat of speaking in all of his work about what in fact is imagination, without pronouncing the term not even once*"[184].

As it will be shown below, imagination as a faculty can formulate reality through creating forms and imposing natural behavioral patterns, without modifying the natural structure of reality.

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[180] C. Castoriadis, *The Imaginary Institution of Society*, p. 127

[181] See also, C. Castoriadis, Radical Imagination and the Social Instituting, in *The Castoriadis reader*, p. 321, where the connection with images is highlighted through the use of the German words *Bilder* for form and *Einbildung* for imagination.

[182] C. Castoriadis, *The Imaginary Institution of Society*, p. 128

[183] See also J. Krummel, Creative Imagination, Sensus Communis, and the Social Imaginary, pp. 255-284, where the historical sequence is extended beyond modernity and encapsulates also postmodern thinkers, being Castoriadis himself, along with Paul Ricouer and Charles Taylor, and Japanese thinkers, being Miki Kiyoshi and Nakamura Yujiro.

[184] C. Castoriadis, Imagination, Imaginary, Reflection (1996, in Greek), in *Done and to be Done*, 2019, translated by K. Spandidakis, Ypsilon/Books, Athens, p. 354.

4.2. Imagination in contrast to identitary-ensemblist logic: The historical ignorance

The imaginary element is identified as in constant articulation and contrast to logic, which is mainly characterized by its identitary and ensemblist properties. Specifically put, **identitary-ensemblist logic**[185] – in short, **ensidic logic** – is the methodological 'core' of traditional western ontological philosophy, originating from Plato and Aristotle, becoming universal by Hegel and systemically termed as physicalism[186], functionalism[187], logicism[188] or structuralism[189].

On the one hand, identitary logic approaches the being through natural or causal identities. In other words, as it is based namely on mathematics, rationalism and causality, "*identitary logic is the logic of determination, which particularizes itself, depending on the case, as a cause and effect relation, as means and end or as the logic of implication*"[190]. On the other hand, ensemblist logic, based on the rudiments of set-theory, posits the objects and the relations which are required for the function of identitary logic. Given that, arises an operational equivalence, according to which "*a set defines a property of its elements (belonging to this set)*" and "*a predicate defines a set (formed by the elements for which it is valid*"[191]. Given these dimensions, "*the 'categories' or logico-ontological operators that necessarily are put to work [...] by ensemblistic-identitary logic*" are, among others "*the principles of identity, noncontradiction, and the excluded third; the property == class equivalence; the existence, strongly stated, of relations of equivalence; the existence, strongly stated, of well-ordered relations; determinacy*"[192].

According to Castoriadis' viewpoint on the history of philosophy, when addressing philosophical issues, identitary-ensemblist logic is granted ontological and epistemological supremacy, whereas imagination is namely ignored and, thus, excluded from bearing any serious philosophical contribution[193]. Due to the criticism towards traditional ontology, Castoriadis refers to identitary-ensemblist logic usually in a negative sense, as being able to grasp only half of the ontological problem. Of course, the author does acknowledge it as absolutely essential, allowing social life to exist[194]; nonetheless, it is proved inadequate to address social imaginary and social-historical, despite its internal exigency to cover every possible stratum[195].

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[185] The alternative term that is commonly used is 'logic of identity' and is occasionally referred to as 'Leibniz's law'. See inter alia P. Bricker, 1996, in *Encyclopedia of Philosophy*, edited by. D. M. Borchert, 2nd edition, vol. 4, Thomson Gale, p. 568. See also C. Castoriadis, The Logic of magmas, p. 294, where the definition of identity in mathematics is indeed attributed to Leibniz.

[186] C. Castoriadis, *The Imaginary Institution of Society*, p. 170

[187] C. Castoriadis, *The Imaginary Institution of Society*, p. 115, 170, 386, n. 1

[188] C. Castoriadis, *The Imaginary Institution of Society*, p. 171

[189] C. Castoriadis, *The Imaginary Institution of Society*, p. 171-2

[190] C. Castoriadis, *The Imaginary Institution of Society*, p. 175

[191] C. Castoriadis, *The Imaginary Institution of Society*, p. 223. See also C. Castoriadis, The Logic of magmas, p. 292, where the definition of the set by the founder of set-theory, Georg Cantor, is discussed.

[192] C. Castoriadis, The Logic of magmas, p. 293

[193] For the historical ignorance concerning imagination in philosophy, see the author' s note by C. Castoriadis in The Discovery of Imagination (1978), *World of Fragments*, pp. 213-216.

[194] C. Castoriadis, *The Imaginary Institution of Society*, p. 175, 223

[195] C. Castoriadis, *The Imaginary Institution of Society*, p. 175, 205-6

4.3. Radical and creative nature of imagination

Castoriadis' notion on imagination is deeply embedded with its radically creative nature. **Radical imaginary** or **radical imagination** is "*the originary faculty (of human being) of positing or presenting oneself with things and relations that do not exist, in the form of representation (things and relations that are not or have never been given in perception)*" and "*the elementary and irreducible capacity of evoking images*"[196] even of something which does not exist and never existed in the natural world[197]. Its radical character is based on the supposition that "*this imagination is* before *the distinction between 'real' and 'fictitious'*", as "*it is because radical imagination exists that 'reality' exists* for us – *exists* tout court – *and exists* as *it exists*"[198]. In that sense, radical is the primary imagination and is distinguished from merely reproductive or simply combinatory representation of reality, which is named secondary imagination[199]. This latter mechanism resides within the human psyche, where it "*pre-exists and presides over every organization of drives, even the most primitive one*"[200]. In that sense, following that radical imagination "*makes a 'first' representation arise out of a nothingness of representation, that is to say,* out of nothing"[201], it assumes the role of creative imagination – else, 'kreative Einbildungskraft' – and, thus, constitutes the founding milestone not only for the notion of creation ex nihilo, but also for social imaginary.

In all fairness, this radical element of imagination does not wholly reflect its totality, but coexists with other aspects, already acknowledged by traditional ontology. Specifically put, 'kreative Einbildungskraft' arises as the primary imagination, which aligns with, but still is distinguished from, the secondary imaginary. Opposing the former, the latter term bears content that traces back majorly to Aristotle[202] and Kant and is used to describe imagination as "*either reproductive or simply combinatory (and usually both)*" and as being "before *the distinction between 'real' and 'fictitious*"[203]. As such, secondary imagination is denied any radical essence and is granted the role of common sense or communal sensibility – else, '*sensus communis* –, based on which human perception organizes and assesses the data drawn empirically by the senses[204].

Under the light of these viewpoints, creative imagination assumes the role of an a-causal *vis formandi*[205]. On the one hand, it is clarified by Castoriadis that "*a-causal does not mean*

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[196] C. Castoriadis, *The Imaginary Institution of Society*, p. 127

[197] See C. Castoriadis, *The Imaginary Institution of Society*, p. 142, concerning the images in the human unconscious.

[198] C. Castoriadis, Radical Imagination and the Social Instituting, p. 321. As it is shown below, it is exactly from this standpoint that epistemological issues concerning human perception and creative imagination arise.

[199] C. Castoriadis, Radical Imagination and the Social Instituting, p. 321

[200] C. Castoriadis, *The Imaginary Institution of Society*, p. 286-7

[201] C. Castoriadis, *The Imaginary Institution of Society*, p. 283

[202] C. Castoriadis, Radical Imagination and the Social Instituting, p. 321, nonetheless with the explicit exception of the second half of the third book of *De Anima*. For the hidden co-existence of primary and secondary imagination in Aristotle' s ontology, see below, along with C. Castoriadis, The Discovery of Imagination, p. 223-228.

[203] C. Castoriadis, Radical Imagination and the Social Instituting, p. 321

[204] For further elaboration, see J. Krummel, Creative Imagination, Sensus Communis, and the Social Imaginary, pp. 255-284.

[205] C. Castoriadis, Radical Imagination and the Social Instituting, p. 322

'unconditioned' or absolute, ab-solutus*, separated, detached, without relations*"[206]. On the other hand, radical imaginary does not create matter, but only formulates images and figures based on the experience received via perception[207]. Especially beyond the scope of individual human psyche, "*the seat of this* vis *as instituting social imaginary is the anonymous collective and, more generally, the social-historical field*"[208], which bears the capacity to create social imaginary significations as meaning and institutions as figures. That being said, in terms of biological issues, it is not that radical imaginary modifies the biological structure of human beings, nonetheless it can indeed affect their biological behavior and formulate new patterns of interaction with the environment.

It is worth to underline that the faculty of radical imaginary is regarded as an inner property of human nature itself ('*phusis*'), capable of distinguishing human kind ('*eidos'*) from the rest of the living species. In other words, human *phusis* "*is at its core and as* phusis *proper to man, radical imaginary: radical imagination of the psyche, social instituting imaginary at the collective level*"; in addition, "*it also appertains to this* phusis *of man to* create *norms, as well as to create (instituting imaginary) significations*", meaning therefore that "*a human being totally 'without imagination' would be a monster in the Aristotelean sense*" [209]. In that sense, radical imagination constitutes the distinctive core of human nature, based on which it bears the faculty to create its own norms for itself to live under, thus forging reality as its own-world ('*Eigenwelt*')[210]. However, in terms of the content of these norms, radical imagination as *physis* ends up only as the prerequisite condition that allows the emergence of norms, but under no circumstances may determine or affect their regulative content. That is because it "*does not coincide with any norm […], nor, as such, does* phusis *permit one to 'deduce' or to 'found' any norms*"; in that sense, "*there is* no content *to these norms that allows itself to be sifted out as effectively universal; there is, for humans, no nomos, no norm* materialiter spectata *that would be* phusei*, by nature, by human* ousia"[211]. Given these standpoints, it is deduced that "*the sole 'norm' consubstantial with the* phusis *of man is that man cannot* not *posit norms*"[212], along with the fact that "*every human being can, in principle, reimagine what another human being has imagined*"[213].

What is more, it is precisely due to this emergence of norms via the radical imaginary that human societies are made possible. And when the socialization of the human psychic monad is delivered, then it is standing for a survival value; for "*if humanity had not created the institution, it would have disappeared as a living species*"[214]. In that sense, despite "*that human species proves […] to be a monstrosity made up of specimens that are, as such, absolutely unfit for life"* and

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[206] C. Castoriadis, Radical Imagination and the Social Instituting, p. 322. As it will be shown below, creation ex nihilo as the product of the imaginary vis formandi is actually subject to significant constraints.
[207] C. Castoriadis, Complexity, Magmas, History-The example of the medieval city (1993, in Greek), in *Done and to be Done,* p. 328
[208] C. Castoriadis, Radical Imagination and the Social Instituting, p. 322
[209] C. Castoriadis, Done and To Be Done, p. 374
[210] For the concept of *Eigenwelt*, see below.
[211] C. Castoriadis, Done and To Be Done, p. 374
[212] C. Castoriadis, Done and To Be Done, p. 375
[213] C. Castoriadis, Done and To Be Done, p. 390
[214] C. Castoriadis, Done and To Be Done, p. 367

"*would probably have disappeared*", the crucial condition of its survival lies with its rise "*at the level of the anonymous collective with society's self-creation as instituting society*" [215]. That is because "*the monadic psyche of the singular specimen of* homo sapiens*, mad as it is, is transformed into a social individual by undergoing the imposition of language, behaviors, and realizable aims*" and, thus, "*it is made capable of coexisting with others*"; furthermore, inasmuch as "*it has imposed on it concretely coinable aspects of the magma of social imaginary significations*", as a result becomes "*capable of furnishing the psyche with a meaning for "individual" and collective existence and for reality*", which "*can lend themselves to this psychical cathexis of meaning only because they are, each time, constructed in an appropriate fashion by the institution of society*"[216].

Ultimately, the mostly developed form of human radical imagination is social imaginary. Following its nature as a faculty of the psychic monad, imaginary is elevated on the collective level to a faculty of the social-historical.

4.4. Social imaginary: The unique faculty of the social-historical field

In order to associate radical imagination with the emergence of social structure as the surviving circumstance for human kind, imagination ought to be conceptualized in the manner that goes beyond the narrow subjective field of the single individual. To that end, Castoriadis was one of the first thinkers of western philosophy to expressively introduce the concept of **social imaginary**. Under that term is meant the system of significations, the function of which constitutes and articulates the social world[217]. In other words, this system "*is operative in the practice and in the doing of the society considered as a meaning that organizes human behavior and social relations, independently of its existence 'for the consciousness' of that society*"[218]. At the same time, "*it cannot be accounted for by reality, by rationality, or by the laws of symbolism*"[219], because social imaginary precedes systemically the formulation of rational laws.

Bearer of this faculty is the **social-historical**, which stands for "*the anonymous collective whole, the impersonal-human element that fills every given social formation but which also engulfs it, setting each society in the midst of others, inscribing them all within a continuity in which those who are no longer, those who are elsewhere and even those yet to be born are in certain sense present*"[220]. That said, social imaginary marks a characteristic of the collective field, where society and history are intertwined: for it is impossible to separate society from history, because, if the social is self-altered, it can make itself only as history, as temporality; on the other hand, if the

[215] C. Castoriadis, The Ontological Import of the History of Science, p. 354
[216] C. Castoriadis, The Ontological Import of the History of Science, p. 354
[217] C. Castoriadis, *The Imaginary Institution of Society*, p. 146
[218] C. Castoriadis, *The Imaginary Institution of Society*, p. 141. Towards a better understanding, familiar mechanisms, systemically correspondent to the social imaginary, can be traced back to the Ideas of *Plato* or the Collective Unconscious of *C. Jung*; nonetheless, the similarities are only superficial, whereas the content and the function of social imaginary differs substantially from the abovementioned.
[219] C. Castoriadis, *The Imaginary Institution of Society*, p. 141
[220] C. Castoriadis, *The Imaginary Institution of Society*, p. 108

historical is emergence of institution, it is a specific mode of social co-existence[221]. What is more, with social-historical is introduced a unique ontological entity, that radically surpasses and systemically precedes the traditional categories of subjects, individuals and their groups. That is because the latter remain "*the products of a socialization process, for their existence presupposes the existence of an instituted society*"[222].

The existence of social imaginary is founded on the presupposed concept that the social-historical is attributed with different properties than the properties of the individuals adhering to it. Specifically in Castoriadis' words, "*the fact that, in the human world, we encounter something that is at once more than and less than a 'substance' – the individual, the subject, the for-itself – should not diminish in our eyes the reality of the 'field'*"; after all, drawing a parallel from purely scientific grounds, "*what belongs to the body in question as 'its own', its mass in the classical conception, would not be, in accordance with certain modern cosmological conceptions, a 'property' of the body but the expression of the action on this body of all the other bodies in the universe (Mach's principle)*"[223]. In that sense, social imaginary is acknowledged as a property of the social-historical field that remains distinct from the properties of its inhabiting individual units – else, "*a property of 'coexistence' that emerges on the level of the whole*"[224].

Therefore, while being a collective entity[225], "*the social-historical field is irreducible to the traditional types of being*"[226] and "creates *a new ontological type of order*"[227] that is capable of instituting itself. Given that, Castoriadis explicitly proposes the requirement of "*a radical ontological conversion*", because the inherited philosophy is "*bound to ignore the proper being of the social-historical*" and "*is inevitably driven to ask, "Creation* by whom*?"*"[228]. Yet, the answer according to Castoriadis is that "*creation, as the work of the social imaginary, of the* instituting *society (*societas instituans*, not* societas instituta*) is the mode of being of the social-historical field, by means of which this field* is"; and since "*society is self-creation deployed as history*"[229], social-historical is not only the subject of social imaginary, but also offers itself as the instituted object for social imaginary, as the instituting origin, the source of this creative power.

Under the scope of the abovementioned concepts, Castoriadis made his fundamental assertion that any social-historical field via its social radical imaginary has the capacity to

[221] C. Castoriadis, *The Imaginary Institution of Society*, p. 215. Specifically associated with social instituting imagination, social-historical "*is the union* and *the tension of instituting society and of instituted society, of history made and of history in the making*" (C. Castoriadis, *The Imaginary Institution of Society*, p. 108).

[222] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 8

[223] C. Castoriadis, *The Imaginary Institution of Society*, p. 144.

[224] C. Castoriadis, *The Imaginary Institution of Society*, p. 144.

[225] It is not without importance to point out that social-historical is differentiated from abstract terms, such as collective consciousness or collective unconscious (C. Castoriadis, *The Imaginary Institution of Society*, p. 179); for it does not incorporate a hyperorganism, independent from the social subjects, but it originates from the social subjects themselves and through their imaginary capacity.

[226] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 8

[227] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 13

[228] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 13-4

[229] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 13

autonomously self-create itself[230] by providing social imaginary significations embodied in social institutions. Therefore, apart from radical, social imaginary is also instituting, capable of creating institutions that form the social-historical.

4.5. From the psychic monad to the social individual

Asserting the autonomous ontological position of the collective social-historical, Castoriadis anchors its impact on its single subject and demonstrates the transition from the psychic monad to the social individual. This leap is based on psychoanalytic grounds that primarily transcend from Freudian principles, but afterwards follow Castoriadis' own theory.

The basic pattern lies with the following presuppositions. In the beginning, when a human is born into a social-historical, its psyche is and acts as a whole, unbroken, dominated by its own absolute radical imagination[231]. Analogously to the world of the social-historical, "*the world of the singular psyche is also, to begin with, a world of its own*"[232] and driven thusly by its own imagination to be isolated in its monadic closure and to produce "*only private phantasms*"[233] for its own needs – yet "*not institutions*"[234] to acquire meaning. That is because human psyche arises as the rupture in the psychic evolution of the animalistic realm, thus being detached from strict functionality or mere biological need[235]. In that sense, due to this absoluteness of its radical imagination, psyche is regarded as autistically monadic[236], contrary to the Freudian principles[237]. In stronger terms, "*the originary psychical subject* is *this primordial 'phantasy': at once the representation and the investment of a Self that is All*"[238]; what is more, while capable only to refer to itself, the 'world' of the psychical subject "*is at one and the same time self, proto-subject and proto-world, as they mutually and fully overlap*", without any possible distinction between "*itself and the rest*" or "*representation and 'perception' or 'sensation'*"[239]. Therefore, "*the original indistinguishability of these 'elements' ultimately leads, then, to a representation of '*everything (as) self*', the sole reality for the psyche*"[240].

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[230] When referring to self-creation by social imaginary, Castoriadis usually adopts the specific terms of self-instituting and self-instituted social-historical field.

[231] C. Castoriadis, Radical Imagination and the Social Instituting, p. 327

[232] C. Castoriadis, Done and To Be Done, p. 365

[233] C. Castoriadis, The Ontological Import of the History of Science, p. 373

[234] C. Castoriadis, Done and To Be Done, p. 376

[235] C. Castoriadis, Imagination, Imaginary, Reflection (in Greek), p. 405

[236] C. Castoriadis, *The Imaginary Institution of Society*, p. 297

[237] S. Adams, p. 88

[238] C. Castoriadis, *The Imaginary Institution of Society*, p. 287

[239] C. Castoriadis, *The Imaginary Institution of Society*, p. 294. According to the insightful description by S. Adams, p.92, "*the subject at this juncture is conceived as ''totalitarian inclusion,'' autistic in the sense of undivided; the subject is in an undifferentiated, monadic state*", arising thusly as "*not only the totality of the subjects in and the organization of the scene*", but also as "*the scene of the fantasy element of an initial ''state''*".

[240] C. Castoriadis, *The Imaginary Institution of Society*, p. 293

However, "*society, for the initial psyche, is* Ananke *pure and simple*"[241]; thus presupposed, human psyche, despite being monadic, retains its tendency to acquire meaning and become complete, thus being drawn to be sublimed via socialization[242]. As "*the psyche doubtless contains as potentiality its opening up to the world*"[243], its socialization becomes imminent and its monadic closure is essentially ruptured by the social-historical – at first implicitly projected through the primary role of the mother[244] and the family in general. That is because, being a social-historical sublimation under a psychical veil[245], "*socialization is the process whereby the psyche is forced to abandon (never fully) its pristine solipsistic meaning for the shared meanings provided by society*"[246]. In addition, this process, being the work of the institution, is "*mediated of course in each case through already socialized individuals*"[247], whereas, as shown above, it is precisely only this process that "*can bring the psyche out of its originary monadic madness*"[248], which thus enables its survival and "*imprints on it, or builds around it, the successive layers of what, in its outer face, is the individual*"[249]. Due to this rupture, the psyche suffers a loss to its absolute initial state, which stands for "*the first work imposed on the psyche by the fact of its being included in the world*"[250]; therefore, when engaged under the grip of the social imaginary, the psychical monad transforms into the social individual "*for whom there exist other individuals, objects, a world, a society, institutions - things none of which, originally, has meaning or existence for the psyche*"[251]. As a result, the essential engagement of the individual with the social-historical and its imaginary significations shatters its functional motives towards non-functionality and, thus, representational pleasure overtakes organ pleasure[252]. In the end, sublimation via socialization is best summarized by S. Adams as "*the sometimes violent encounter of the radical imagination and the radical imaginary from whose ashes the social-individual as subject and the being of the world emerge as meaningful*"[253].

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[241] C. Castoriadis, Done and To Be Done, p. 378

[242] S. Adams, p. 88

[243] C. Castoriadis, *The Imaginary Institution of Society*, p. 335

[244] See C. Castoriadis, Done and To Be Done, p. 376 and 378, where iconically is stated that "*the mother is society plus three million years of hominization*" and socialization is depending on "*the mother's decisive role in the breakup of the psychical monad*".

[245] C. Castoriadis, *The Imaginary Institution of Society*, p. 311

[246] C. Castoriadis, Radical Imagination and the Social Instituting, p. 330

[247] C. Castoriadis, Time and Creation (1988), in *World in Fragments-Writings on Politics, Society, Psychoanalysis and the Imagination*, p. 385

[248] C. Castoriadis, *The Imaginary Institution of Society*, p. 309

[249] C. Castoriadis, Time and Creation, p. 385. In all fairness, S. Adams admits that "*proto-meaning will continue to be important in the unconscious, but over and above this, the establishment of the ''reality ego'' opens for the subject access to the horizons of meaning and signification, where the two poles of meaning encounter each other and bring the other into the being of the world*" (p. 93).

[250] C. Castoriadis, *The Imaginary Institution of Society*, p. 297

[251] C. Castoriadis, *The Imaginary Institution of Society*, p. 274. As is shown below, contributing for the hereby project is primarily the fact that, apart from the psyche as the core essence of the human being, its perception is also correlatively subject to social instituting.

[252] C. Castoriadis, Done and To Be Done, p. 378, C. Castoriadis, *The Imaginary Institution of Society*, p. 315

[253] S. Adams, p. 99

That said, when a psychic monad cannot be socialized, in contradistinction Castoriadis acknowledged these cases as pathological. For example, this undifferentiated, monadic state, driven by inclusion and closure, is witnessed in autism[254]: for whatever reason – be it psychic or biological – the unchangeable autistic monad may not communicate with its external world and, hence, is rendered dysfunctional, in terms of not only its social sublimation, but also its own necessities. And whereas a functioning human psyche will open itself and share a part of its totality with its social counterpart, the dysfunctioning psyche will remain closed and refute any social interaction that may endanger its unbroken solipsist reality.

Nonetheless, the rupture by social-historical is always incomplete, because the psychic monad partially resists socialization. In other words, "*the psyche itself is a massive and monstrous case of inadaptation*", which "*is, somehow or other, subdued by the social institution and the socialization of the psyche - which certainly has, in this regard, a value, not 'adaptive', but one of survival: if humanity had not created the institution, it would have disappeared as a living species*"[255]. Given that, Castoriadis asserts that in the end "*psyche is irreducible, in its kernel, to society*" [256] and "*in its most deep-seated strata, it remains so until the very end, even if the socialization of the psyche opens it to a larger proper world, the public world of the society that socializes it*"[257]; in that sense, despite its socialization, the psychic monad – along with its radical imagination – continues to reside within the social individual, the latter of which partially manifests the "*social fabrication*"[258] of the former.

In all fairness, what Castoriadis did not distinctly ascertain is the fact that the converse case is also possible: a dysfunctional psychic monad, albeit unbroken and non-socialized, still retains some kind of interaction with its social environment[259]. In other words, any monadic psyche, regardless of its specific circumstances, bears primarily the capacity to interact with its external environment; and this claim is valid, in spite of the fact that in some cases the capacity for socialization is rather limited or even nullified. Among the contemporary thinkers of the field, Marcel Gauchet is acknowledging that Castoriadis' work constitutes the best systematization of orthodox psychoanalytical theory, because it precisely illustrates Freud's most original contribution, "*the indestructible persistence of this primordial closure within the human psyche*", which "*is, in that sense, constitutively fragmented*"; however, while standing merely on the premise that exists "*a passage from a primary undifferentiated state, characterized by ignorance of selfhood and of the self's limits (expressed, for example, in an imaginary fusion with the maternal body), to a*

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[254] C. Castoriadis, From the Monad to Autonomy, p. 180, C. Castoriadis, False and True Chaos, p. 391

[255] C. Castoriadis, Done and To Be Done, p. 368, where nevertheless it is added that "*this tautology becomes aphonic when faced with the infinite variety of social imaginary significations*".

[256] C. Castoriadis, Time and Creation, p. 385

[257] C. Castoriadis, Done and To Be Done, p. 365. After all, drawing conclusions from J. Arnason, S. Adams acknowledges that "*sublimation then is the establishment of the intersection between the private and common worlds respectively*", the process of which "*replaces furthermore the psyche's ''private'' objects of cathexis with socially instituted objects and meanings, with ''common language'' and ''social doing'' illustrative of this process*" (p. 93).

[258] C. Castoriadis, Time and Creation, p. 385

[259] This point is accurately contributed by S. Adams, p. 92, according to whom recent discussion "*has cast doubt on the polar model of the (neo)Freudian monadic psyche as unaware of the self and its limits to an opening toward reality*".

progressive differentiation of individuality", traditional psychoanalytical theory is condemned to stand on "*a naively linear and fundamentally inadequate genetic model*" [260]. Instead, Gauchet argues that "*the recent results of scientific observation, especially those of the scientific study of childhood and of precocious intelligence, call for a thoroughgoing revision of the model of psychic development which is still taken for granted by psychoanalytical theorists*", aiming thusly to "*the process of the constitution of psychic individuality and with what one might call 'becoming human'*"[261].

To that end, these polarizing psychoanalytic models traditionally adopted – 'closeness' and 'openness' – are juxtaposed with "*an original openness of the human psyche with regard to reality, and – correspondingly – an original differentiation of individuality*" [262]. What is more, this latter dipole coexists "*with hallucinatory closure and with the blurring of personal boundaries*", which are thought of as "*not primordially given*", but rather as "*active components that from the outset compete with the sense of difference and the passion for reality*" [263]. Therefore, the contemporary understanding of psychoanalysis is not exhausted to a passage from the psychic monad to the social individual, but consists of "*a dialectic of two dimensions*", the interaction of which points to "*a constructive process whose stages are successive compromises between openness and closure*"[264]. And this dialectical mechanism bridges the distance between the initial psychic monad and the resultant social individual: the former arises as not merely 'closed' to itself, but at the same time ontologically 'open' to the world[265]; whereas the latter is the result of the openness of its source and the closeness that derives from a finite network of social institutions.

Of course, it must be underlined that, as already mentioned above, Castoriadis himself accepted that the psyche contains the innate potential to open itself to the world[266]; however, this tendency – internal as it may be – was mostly associated with the socialization of the psyche. In that sense, Castoriadis' attention was one-sidedly focused on the social rupture of the psyche, excluding thusly the simple interaction of the psyche with its external world; after all, this interaction may not approach the magnitude of socialization, yet remains possible and indeed signifies a distinct communicative pathway for the psyche other than socialization. And that is precisely what would not refute, but only expand Castoriadis' psychoanalytic model. Besides, even for Gauchet the aim is not to deny the traditional psychoanalytical theories as a whole, but only to suggest "*a very major reformulation of Freudian ideas*" that would "*continue along the same lines, through a deepening of Freudian insights rather than a break with them*"[267].

Given this assertion, the abovementioned example is subject to revision, since an autistic child indeed cannot directly communicate with, but still interacts to its external world. That is because its psychic monad, being dysfunctional and 'closed', is not compatible to socialization, yet

[260] M. Gauchet, Redefining the Unconscious, in *Thesis Eleven*, 71, 2002. p. 10
[261] M. Gauchet, p. 10
[262] M. Gauchet, p. 10
[263] M. Gauchet, p. 10
[264] M. Gauchet, p. 10
[265] S. Adams, p. 92
[266] C. Castoriadis, *The Imaginary Institution of Society*, p. 335
[267] M. Gauchet, p. 12

remains ontologically 'open' to the respective social world that surrounds it; hence, although non-socializable, a limited part of its reality is still adaptable and, as such, offered to formulation by its family and peers. Nonetheless, the reality of the autistic child remains primarily solipsist, because the possibly adaptable area is not adequate to fully fulfill its proper socialization.

Under the light of these standpoints, the individual in the social-historical field is bound to this dipole and attributed thusly a dyadic ontology, originating from the stormy dialectical interplay between its psychic monad and its social individuality. And in spite of any revision of the traditional psychoanalytic framework, this dyadic ontology retains its value, as it introduces imagination as the common reference point for both of its counterbalancing dimensions: radical for the psyche, social for the individual.

4.6. Concluding remarks: Imagination as a social creative force

In conclusion, stepping upon, but venturing farther than traditional philosophy, the thesis hereto adopts the ontological theory of Castoriadis, grounded around the imaginary element. Following this chapter, it is herein acknowledged that imagination does not produce an illusion, but evokes an image, even currently non-existing; that this image is created and assumes an independent ontological weight, distinguishable from the sequences of the ensidic logic; that, as such, imagination is regarded as 'kreative Einbildungskraft' in the sense of 'vis formandi', capable of formulating reality and thus rising to an additional, yet essential, parameter for ontological analysis, despite being generally ignored by traditional philosophy; that, apart from the psychic monad, society as a collectivity is also a subject of imagination, revealing thusly its social dimension beyond the strictly individual level; and, finally, that the individual, despite born as a psychic monad, is sublimed to social imaginary and transformed into the social individual.

Following the analysis of this chapter we can deduce that imagination opens the discussion on the realm of metaphysics as an independent ontological field, deeply bound and coexisting with the physical realm. In other words, the metaphysical/non-material resides where the physical/material does not, but combined they project the two vast areas of the Being, both parallel subject to ontological understanding, but still under different terms and through different methodology. After all, it is important to point out that, in accordance to its ancient Greek etymology, explicitly illustrated by Aristotle [268], 'metaphysics' means neither non-existing, illusionary or illogical, nor supernatural or mythic; on the contrary, it stands for the field beyond ('*meta'*, literally meaning 'after') the physical realm, a non-material field, yet real in every possible

[268] See *The Oxford Dictionary of Philosophy*, p. 240, where in terms of metaphysics is noted that "*originally a title for those books of Aristotle that came after the* Physics*, the term is now applied to any enquiry that raises questions about reality that lie beyond or behind those capable of being tackled by the methods of science*". See also *The Cambridge Dictionary of Philosophy*, p. 564, where is stated that "*metaphysics can also be understood in a more definite sense, suggested by Aristotle's notion (in his* Metaphysics*, […]) of "first philosophy," namely, the study of being* qua *being, i.e., of the most general and necessary characteristics that anything must have in order to count as a being, an entity (*ens*)*".

sense while on a different level of reality. Therefore, according to Castoriadis, the key to enter the metaphysical realm lies with human imagination, especially under its social-historical dimension.

5. *Creation ex nihilo: The vessel of radical imaginary*

In order to elucidate the concept of self-creation of the social-historical by the social imaginary, the ontological problematic on creation *ex nihilo* is presupposed[269].

Creation ex nihilo marks the fundamental ontological principle for the philosophy of Castoriadis, as it is densely associated with the qualitative properties of Being as chaotic and temporarily irreversible and imagination as *kreative Einbildungskraft*. That being the case, the ex nihilo element is generally understood as "*genuine, ontological creation, the creation of new forms, of new* eidé"[270].

The supposition that Being is self-created ex nihilo is preceded by the deeper ontological milestone that Being is chaotic and temporal, bound for a constant non-determinable succession of ontological figures. Nevertheless, when instated on absolute rational order and a-temporality, traditional ontology fails to capture the ontological presuppositions that allow the understanding of imagination as the fundamental creative force.

5.1. Criticism towards the traditional ontology

Primarily Castoriadis poses the fundamental triggering questions regarding the essence of society and history as follows: "*in what way and why are there many societies and not just one; in what way and why are there differences between societies?*"; and even if the differences can be referred as apparent – or even virtual, as part of the identical common substance ('*Ousia'*) – "*why then do we find this appearance, why does the identical appear as different*"[271]? Thus addressed, the social-historical field is dominated by the concepts of *otherness* and *plurality*[272].

According to Castoriadis, the answers of the inherited thought are not satisfactory. In general, the traditional ontology is criticized for believing that "*being must have a single meaning*" and, consequently, that "*this meaning, determined from the start to finish as determinacy[…],*

[269] Some of the content of this chapter has been separately published under the title "The ex nihilo creation in the work of Cornelius Castoriadis - The special case of legal rules" in *AICHI - Φιλοσοφία*, vol. 31, 2020, Kobe University, Japan, pp. 95-136.

[270] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 3

[271] C. Castoriadis, *The Imaginary Institution of Society*, p. 170

[272] The question becomes more complicated, when we consider that everything newly instituted, "*although it is always carried by the concrete materiality of acts and things, goes beyond this particular materiality*" (C. Castoriadis, *The Imaginary Institution of Society*, p. 180), whereas social imaginary significations "*lead to specific conclusions that go beyond any functional 'motives'*" (C. Castoriadis, *The Imaginary Institution of Society*, p. 129). Thus, even if the primary natural circumstances are similar, the differences between social institutions remain inexplicable. Elucidating to that point is the example of raw fish, as mentioned below.

already in itself excluded the possibility of recognizing a type of being that essentially escapes determinacy, like the social-historical or the imaginary"[273]. Thus, by wholly applying the identitary-ensemblist logic, social doing is limited to the dipole between good and evil, as a strict dualistic viewpoint; consequently, imagination and imaginary cannot be anticipated for themselves, as autonomous ontological parameters, but "*always in relation to something else - to sensation, intellection, perception or reality - submitted to the normativity incorporated in the inherited ontology, brought within the viewpoint of true and false , instrumentalized within a function, means judged according to their possible contribution to the accomplishment of the end that is truth or access to true being*"[274].

Given this as the starting point, the criticism focuses on the following points.

Firstly, the inherited ontology anticipates society as a determined unity. Specifically put, under the light of the traditional identitary logic, "*the question of unity and identity of society and of any particular society is carried back to the assertion of a given unity and identity of an ensemble of living organisms; or of a hyper-organism containing its own needs and functions; or of a natural-logical group of elements; or of a system of rational determinations*"[275]. As a result, social is said to derive from a sequence of causal relations, set outside of the social itself, from which social differences emerge. For causality is introduced as the method to or from an essential unifying order that serves as an exogenous stable point, based on which the ontological differences derive from the same substance through causal sequences, but thus depicting inevitably a heteronomous social structure. However, Castoriadis argues that "*causality is always the negation of otherness, the positing of a double identity: an identity in the repetition of the same causes producing the same effects; an ultimate identity of the cause and the effect since each necessarily belongs to the other, or both to the same*"[276]. That is because, if everything springs only from what already existed and exists, then it expresses mainly the essential possibilities of the beginning, without indicating any significant change. In all fairness, Castoriadis generally did not reject the existence of a natural system, based on laws of natural causality[277]; nonetheless, causality is considered partially unimportant to social ontology, as long as its relations are neither examinable, nor able to conceive the social imaginary. Hence, if social succession is regarded causal and determined, then "*cause and effect belong to the same*" and "*neither of these two sets can exist without the other, and they, therefore, both partake of the same, are the parts of a single set*"[278]. Consequently, radical otherness and plurality in society remain inexplicable.

Secondly, while identitary ontology recognizes the succession of historical events as a causal identity, the question of history is also eliminated without concrete explanation. As a result, "*the new is, in every instance, constructed through* identitary *operations [...] by means of what was*

[273] C. Castoriadis, *The Imaginary Institution of Society*, p. 168
[274] C. Castoriadis, *The Imaginary Institution of Society*, p. 168
[275] C. Castoriadis, *The Imaginary Institution of Society*, p. 172
[276] C. Castoriadis, *The Imaginary Institution of Society*, p. 172
[277] See C. Castoriadis, *The Imaginary Institution of Society*, p. 121, where is stated that "since *nature is not chaos, since natural objects are connected to one another, certain consequences ensue*" and "*what is, is not and cannot be, absolutely disordered chaos*".
[278] C. Castoriadis, *The Imaginary Institution of Society*, p. 183

already there"[279]. In that sense, if causality points only to identity, historical differences remain apparent and part of the common unifying order. Therefore, history cannot be understood in its temporal unfolding and is limited to a relation of order among terms; and, "*to the extent that the terms are necessarily* taken up *in this order, they are no more than 'parts' of the One-Whole and co-exist as parts of One-Same*"[280]. Nonetheless, by reducing history to determinable repetition, creation as the emergence of the *other* is denied and, thus, social difference and plurality could be perceived only as the hidden potential in the whole causal historical sequence. But we would ironically wonder "*where, then, was the piano hidden during the Neolithic age*" and would be forced to imply that "*it was inside the possibilities of Being*", meaning that "*its essence was 'already there'*"[281] – a conclusion seriously extravagant and, in any case, impossible to prove. Therefore, the question of otherness remains unanswered, because "*historical time thus becomes a simple abstract medium of successive coexistence*"[282].

Thirdly, the traditional perspective over time is ontologically related mainly to space. This claim is seen as essential to every identitary system of thought[283], in order to deduce the determinacy of the being. However, the special features of space are substantially different from time. Space is related to the determinable being, thus remaining unchanged in all time, while temporality is anticipated as static and, as such, is deprived of any sense of irreversible motion. Hence, if examined outside of its actual temporal dimension, the Being remains *forever* unchanged, still the same, in the atemporal repetition of spatiality[284]. In this sense, identitary time refers only to the present and is limited only to the "*innumerable (and* numbered*) repetition of identitary presents, always identical* as such *and different* only *by their place*"[285], thus sustaining the notion of determinacy through atemporality. Nevertheless, the *other* emerges only from the temporality of being, because the identitary present is unable to bring out social differences in the first place. From that viewpoint, Castoriadis argues that "*we cannot think of time if we do not rid ourselves of a certain way – the inherited way – of thinking of being, that is to say, of positing being as determinacy*"[286]; for, whereas determinacy is accomplished only through spatial dimensions, otherness is grounded on temporality. And, in order for determinacy to be preserved, "*true time, the time of radical otherness, an otherness that can neither be deduced nor produced, has to be abolished*"[287]. Under the light of that assumption, Castoriadis deduces that *"it is fatal to the inherited referential thinking that there is no real* place *for time or that time cannot really* take place *(=exist) precisely because we must look for a place for time, an ontologically determined*

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[279] C. Castoriadis, *The Imaginary Institution of Society*, p. 173. Enlightening is the reference to Aristotle, *On generation and Corruption*, II, 336 a 27-8, according to whom "*[…] it is a law of nature that the same cause, provided it remains in the same condition, always produces the same effect*".
[280] C. Castoriadis, *The Imaginary Institution of Society*, p. 184
[281] C. Castoriadis, *The Imaginary Institution of Society*, p. 198-9
[282] C. Castoriadis, *The Imaginary Institution of Society*, p. 173
[283] C. Castoriadis, *The Imaginary Institution of Society*, p. 194
[284] C. Castoriadis, *The Imaginary Institution of Society*, p. 194
[285] C. Castoriadis, *The Imaginary Institution of Society*, p. 201
[286] C. Castoriadis, *The Imaginary Institution of Society*, p. 191
[287] C. Castoriadis, *The Imaginary Institution of Society*, p. 173

place in the determinacy of what is, hence the time is but a model of place"[288]. However, whereas these series of thoughts continue to exclude the possibility of otherness and plurality, the existing social differences cannot yet be adequately explained.

Finally, identitary-ensemblist ontology is traditionally regarded as sufficient method for analyzing the social-historical field. For, "*if the social-historical is conceivable by means of categories that are valid for other beings, then it cannot help but be homogeneous with them; its mode of being poses no particular question, and it allows itself to be absorbed within total being*"[289]. However, the radical otherness that Castoriadis observes in the social-historical questions the possibility for determinacy through causal identitary relations; and that is because social-historical appears through imaginary significations, which do not comply with causal identity and are not receptive to ensemblisation. According to this line of thoughts, it is argued that "what *the social is, and the way in which it is, has no analogue anywhere else*"[290].

Based on that standpoint, Castoriadis observes that the social-historical demands an ontological scope beyond the traditional identitary-ensemblist logic. That is valid, inasmuch as "*society is not a thing, not a subject and not an idea – nor is it a collection or system of subjects, things and ideas*", whereas every society is composed of "*individuals, who themselves would already have to be social, who would already contain the social within themselves*"[291]. In this sense, the special features of each and every society are not grounded on the individuals, but independently on the particular social-historical field itself; for "*the unity of a society, like its* ecceity *– the fact that it is this particular society and not some other one – cannot be analysed into relations between subjects mediated by things"*[292]. Therefore, society acquires properties, which are distinct from the properties of the constituting individuals – even as a collectivity.

Under the light of this conclusion, Castoriadis develops the concept of creation ex nihilo as the form of ontological genesis. For, if society is recognized as an autonomous entity over its members, then the concept of a self-instituting society arises. Subsequently, this equates to the ability for a society not only to radically alter the social-historical, but also to create – on itself and autogenously – social significations and institutions.

5.2. Ontological prerequisites of creation

5.2.1. Chaos and Apeiron as the primary ontological essence

Firstly, the supposition that Being is self-created ex nihilo is preceded by the deeper ontological milestone that Being is partially, but still indeterminably, chaotic. To that end, Castoriadis adopts the fundamental supposition that qualitatively "*"Being" is not a system, is not a*

[288] C. Castoriadis, *The Imaginary Institution of Society*, p. 191
[289] C. Castoriadis, *The Imaginary Institution of Society*, p. 169
[290] C. Castoriadis, *The Imaginary Institution of Society*, p. 182
[291] C. Castoriadis, *The Imaginary Institution of Society*, p. 178
[292] C. Castoriadis, *The Imaginary Institution of Society*, p. 178

system of systems, and is not a great chain", but "*is abyss, or chaos, or the groundless*", attributed with "*a non-regular stratification: that is, with partial "organizations" that are specific to the various strata we discover (discover/construct, discover/create) in being*"[293].

That point is heavily supported by Castoriadis through sources of the ancient Greek antiquity, mainly Hesiod and Anaximander, as already displayed above. For the hereby needs, it is worthy of mentioning that, in the attempt to illustrate the acts of choosing and judging as the fruits of the ancient Greek social imaginary that lead to the creation of democracy and philosophy, Castoriadis asserts that, when it comes to the question and object of 'hope' "*there is a definite and clear Greek answer, and this is a massive and resounding* nothing"; and this answer is traced back to Hesiod and his myth of Pandora, according to which "*hope is forever imprisoned in Pandora's box*", and to Homer' s Odyssey, where Achilles reveals to Odysseus in the Land of the Dead that "*there is no hope for an afterlife*" since "*it is worse than the worst life on earth*"[294]. Inasmuch as the afterlife is not a subject for hope, of course "*man is liberated for action and thought in* this *world*"[295]; nonetheless the concept of *chaos* is essentially manifested as an ontological milestone.

As of its etymological origins drawn by Hesiod, "*in the proper, initial sense 'chaos' in Greek means void, nothingness*" and "*it is out of the total void that the world emerges*", which remains on itself "*also chaos in the sense that there is no complete order in it, that it is not subject to meaningful laws*"; thus seen, "*first there is total disorder, and then order, cosmos, is created*"[296]. However, since "*at the 'roots' of the world, beyond the familiar landscape, chaos always reigns supreme*", consequently "*the order of the world has no 'meaning' for man: it posits the blind necessity of genesis and birth, on one hand, of corruption and catastrophe - death of the forms - on the other*" [297]. In a parallel, yet philosophical, manner, Anaximander projected a congenital meaning through the concept of *apeiron*, which signifies precisely "*the indeterminate, indefinite another way of thinking chaos*" and, according to Castoriadis, introduces "*a strong though implicit connection between the two pairs of opposite terms,* chaos/cosmos *and* hubris/dike" [298].

Concerning the topic of creation, Castoriadis claims that in the social-historical realm creative thinking and doing is justified precisely because ontologically "*the world is not fully ordered*"[299]. On the one hand, in terms of philosophical thinking, if the world were fully ordered, "*there would not be any philosophy, but only one, final system of knowledge*", whereas "*if the world were sheer chaos, there would be no possibility of thinking at all*" [300]. On the other hand, in terms of political doing, "*if the human world were fully ordered, either externally or through its own 'spontaneous operation', if human laws were given by God or by nature or by the 'nature of society' or by the laws of history', then there would be no room for political thinking and no field for political action and no sense in asking what the proper law is or what justice is*"; simultaneously,

[293] The Imaginary: Creation in the Social-Historical Domain, p. 3
[294] C. Castoriadis, The Greek Polis and the Creation of Democracy, p. 273
[295] C. Castoriadis, The Greek Polis and the Creation of Democracy, p. 273
[296] C. Castoriadis, The Greek Polis and the Creation of Democracy, p. 273
[297] C. Castoriadis, The Greek Polis and the Creation of Democracy, p. 273
[298] C. Castoriadis, The Greek Polis and the Creation of Democracy, p. 273-4
[299] C. Castoriadis, The Greek Polis and the Creation of Democracy, p. 274
[300] C. Castoriadis, The Greek Polis and the Creation of Democracy, p. 274

"*if human beings could not create some order for themselves by positing laws, then again there would be no possibility of political, instituting action*", whereas "*if a full and certain knowledge (*episteme*) of the human domain were possible, politics would immediately come to an end, and democracy would be both impossible and absurd: democracy implies that all citizens have the possibility of attaining a correct* doxa *and that nobody possesses an* episteme *of things political*"[301].

Under the light of these viewpoints, Castoriadis concludes that not only "*chaos is the ground of being*", but is also "*even the groundlessness of being*", "*the abyss that is behind every existent thing*"[302]. In addition, following Being's chaotic – else, inexhaustible – nature, its immanent capacity for creation via the *vis formandi* is emerging[303]; for, inasmuch as the Being is chaotic, it retains at the same time formative potential, thus becoming susceptible to formulation[304]. That said, it is suggested that a new ontology is arising "*in which chaos will be the fundamental "determination" of being*" through creation of forms, thus ensuring that "*chaos will always also present itself as cosmos, that is to say, as organized world in the broadest sense of the term, as order*"; and, despite our attempt to discover its organization and ultimate order, "*it escapes us precisely because the various strata of what presents itself as being are irreducible to other supposedly more fundamental or more elementary strata*"[305].

5.2.2. Time and ontological succession

Secondly, inasmuch as "*Being is not only "in" time, but is through (by means of, by virtue of) time*", it is asserted that "*time either is nothing or is creation*"; and following that time is the milestone of ontological succession, it "*is unthinkable without creation; otherwise, time would be only a supernumerary fourth spatial dimension*"[306]. As such, temporal succession, resulting to the emergence of new figures, indicates that Being is self-creating and self-created; and the fulfillment of this ontological demand lies with the ontological genesis provided in the form of creation ex nihilo.

Towards elaboration, Castoriadis associates creation with the properties of natural temporality and how they are socially instituted; for "*of the world and of society by society, the institution of time is always an essential component*"[307].

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[301] C. Castoriadis, The Greek Polis and the Creation of Democracy, p. 274

[302] C. Castoriadis, False and True Chaos, p. 388-9

[303] C. Castoriadis, False and True Chaos, p. 388. Herein is also added that "*this inexhaustibility of being comes from this immanence of its* vis formandi".

[304] C. Castoriadis, False and True Chaos, p. 389

[305] C. Castoriadis, False and True Chaos, p. 389. Especially concerning specific kinds of phenomena, it is concluded that "*there's no possible way of reducing the social historical to the psychical, nor both of them to something else, and that there is -no possible way of reducing the biological to the physicochemical, for the very simple reason that what emerges for example already with the biological is a meaning that doesn't exist in the physical world*".

[306] The Imaginary: Creation in the Social-Historical Domain, p. 3

[307] C. Castoriadis, *The Imaginary Institution of Society*, p. 186

In the beginning, Castoriadis claims that the irreversibility of the succession of events or phenomena is a natural property. That is, "*the irreversibility of time belongs to the first natural stratum of which every institution of society must (under penalty of death) take account*", but thus "in a certain way *and not 'absolutely'*"[308]. In this sense, based on the order provided by the first natural stratum, arises the following fundamental supposition: time has properties that exist independent from the social-historical, but affect the social being and doing; simultaneously, there is no obligation to institute time with its natural properties, but critical remains the "*manner in which this local irreversibility is instituted and taken into consideration in the representation and the activity of society*"[309].

In general, Castoriadis accepts that, on the one hand, "*the social-historical emerges in what is not social or historical – in the pre-social, or the natural*"[310]. That said, social instituting is leaning on the first natural stratum, because natural facts and identities demonstrate actual and practical impacts on any social-historical[311]. On the other hand, for a society every natural identity is brought into being only when it is instituted "*as the* rule *and* norm *of identity*"[312]. Hence, the natural identity not only cannot be repeated by the social institution, but it can be elaborated only "*up to a certain point*" [313]– even taken over *quasi* arbitrarily. Therefore, natural identities do transcend to social institutions; yet, regardless that the natural cannot be ignored by the social-historical, the manner in which it is instituted is not affected and, consequently, cannot be pre-determined.

Such instance is inferred between natural temporality and social-historical temporality, to which Castoriadis claims that "*the emergence of otherness is already inscribed in pre-social, or natural, temporality*"[314]. Specifically put, time is regarded under the light of general relativity, as is depicted on contemporary physics. In other words, "*energy-matter 'is' the local curvature of space-time and, moreover, the global properties of space-time 'depend' on the quantity of the energy-matter that it 'contains'*"[315]. Hence, natural temporality is established as the fourth dimension of the natural beings and obtains an independent position along with the spatial dimensions.

Furthermore, Castoriadis points out that, due to its irreversibility, "*time is the emergence of other figures*" and that "*the pure schema of time is the schema of the essential alteration of a figure, the schema that presentifies the breaking up and the suppression of one figure through the emergence of a(nother) figure*"[316]. Under that light, the otherness and plurality of the natural and historical reality are elucidated, for "*'time' as the order of succession* seems *to be required [...] in order to permit the identical to differ from itself: the 'same' thing is never exactly the same, even*

[308] C. Castoriadis, *The Imaginary Institution of Society*, p. 202
[309] C. Castoriadis, *The Imaginary Institution of Society*, p. 203
[310] C. Castoriadis, *The Imaginary Institution of Society*, p. 204
[311] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 10
[312] C. Castoriadis, *The Imaginary Institution of Society*, p. 205
[313] C. Castoriadis, *The Imaginary Institution of Society*, p. 202
[314] C. Castoriadis, *The Imaginary Institution of Society*, p. 204
[315] C. Castoriadis, *The Imaginary Institution of Society*, p. 188-9
[316] C. Castoriadis, *The Imaginary Institution of Society*, p. 193

when it has suffered no 'alteration', for the very reason that it is in *another time*"[317]; as a result, "*true time, the time of otherness-alteration is a time of bursting, emerging, creating*" and "*this present exists as originating, as immanent transcendence, as source, as the surging forth of ontological genesis*"[318].

Towards a different ontological perspective, Castoriadis, observing the impact of natural temporality on the social-historical field, distinguishes between natural temporality and imaginary temporality – what in ancient Greek terms stood correspondingly for the distinction between *chronos* and *kairos*. Inasmuch as the abovementioned natural identity belongs to the first natural stratum, "*any society can never be absolutely separated-distinguished-abstracted*" from the emergence of otherness[319]; for natural temporality as self-alteration affects society either way. At the same time, "*the social-historical institution of temporality is not, and cannot be, a repetition or an extension of natural temporality*"[320], for socially instituted temporality is not obliged to embody every natural property. In that sense, "*each society* is *also a way of making time and of bringing it into existence, […] a way of making itself be, of bringing itself into existence as society*"[321]. Thus, despite the fact that social-historical temporality originates strictly from a natural identity, it is embodied by an institution, the formulation and effect of which remains imaginary.

Indeed, regarding social representing, time is instituted as the time of mark-makings. Inasmuch as the explicit institution of time is essential, then every society institutes its own temporality and the description and analysis of the social institutions is based on the identitary time[322]. In other words, "*the social historical is perpetual flux of self-alteration – and can only exist by providing itself with 'stable' figures by which it makes itself visible […]; the primordial 'stable' figure is here the institution*"[323]. Thus, the time of signification can be conceived only through the time of mark-making. Otherwise, significations without identitary time "*would be undefinable, impossible to situate, ungraspable – it would be* nothing"[324]. Consequently, the needs of social representing indicate that the manner through which society institutes social-historical temporality is identitary – which leads to atemporality, not natural temporality.

However, in the field of social doing "*society in general, and each society in particular is 'first' the institution of an 'implicit' temporality*"[325]. In other words, it is claimed that, should the social institution of time lean on the emergence of radical otherness, temporality as self-alteration cannot be ignored; for "*the time of doing would not be a time of doing and would not even be a time at all, if it did not contain the critical moment, the singularity*"[326]. To wit, radical otherness as a natural property is deeply engulfed in the first natural stratum and manifests such dominance that

[317] C. Castoriadis, *The Imaginary Institution of Society*, p. 191
[318] C. Castoriadis, *The Imaginary Institution of Society*, p. 201
[319] C. Castoriadis, *The Imaginary Institution of Society*, p. 205
[320] C. Castoriadis, *The Imaginary Institution of Society*, p. 205
[321] C. Castoriadis, *The Imaginary Institution of Society*, p. 206
[322] C. Castoriadis, *The Imaginary Institution of Society*, p. 205-6
[323] C. Castoriadis, *The Imaginary Institution of Society*, p. 204
[324] C. Castoriadis, *The Imaginary Institution of Society*, p. 210
[325] C. Castoriadis, *The Imaginary Institution of Society*, p. 206
[326] C. Castoriadis, *The Imaginary Institution of Society*, p. 212

imposed itself implicitly, even if it is denied by the explicit instituting of social-historical time. That said, without self-alteration socially instituted temporality would cease to be a temporality entirely, as it would be deprived of the very essence of its intrinsic property. To that end, Castoriadis specifies that "*the time of doing **must** thus be instituted so as to contain singularities that are not determinable in advance, as the possibility of the appearing of what is irregular, of accidents, of events, of the rupture of repetition*"; "*it **must**, in its institution, preserve or make room for the emergence of otherness as intrinsically possible*", because "*the time of doing is necessarily much closer to true temporality than the time of social representation is or it can be*"[327].

Regarding the boldness of that statement, it is alone quite iconic the fact that, despite usually avoiding any prospect of social evaluation, Castoriadis stresses the point hereto with unusual deontological tones. That is because, apart from demonstrating a milestone for his ontological perspective, that same point addresses simultaneously the existential problem in the context of social instituting. That is to say, the instituted denial of time is mainly regarded as an instituted imaginary compensation against mortality; for "*society offers subjects […] the means by which to defend themselves by neutralizing time, representing it as flowing always along the same banks, carrying along the same forms, taking with it what was and prefiguring what is to come*"[328]. As a result, the primary cause for the instituted negation of time lies with the fear of death; subsequently, the aim constantly pursued is the avoidance of acknowledging death as a part of life. Thus, by denying self-alteration as a property of natural temporality, the alteration of human entity towards its self-decadence is also denied. Upon this observation, the deontological remarks are understood, because "*everything occurs as if society had to negate itself as society, conceal its being as society by negating the temporality that is first and foremost its own temporality, the time of otherness-alteration that it brings into existence and that, in turn, makes it exist as society*"[329].

Consequently, Castoriadis concludes that, while traditional ontology nullifies the essence of natural temporality, social institutions fail to incorporate self-alteration and radical otherness. Practically speaking, this denial "*is unceasingly translated into the continuous self-destruction of creativity in society and in human beings themselves*"[330].

Contrary to the traditional perspective, Castoriadis acknowledges social-historical field as subject to continuous self-alteration, from which – deliberately or not – new social institutions and significations are created. Hence, instead of everything happening "*as if society were unable to recognize itself as making itself, as instituting itself, as self-instituting*"[331], temporality leads to

[327] C. Castoriadis, *The Imaginary Institution of Society*, p. 212, emphasis not in the original
[328] C. Castoriadis, *The Imaginary Institution of Society*, p. 213
[329] C. Castoriadis, *The Imaginary Institution of Society*, p. 213
[330] C. Castoriadis, *The Imaginary Institution of Society*, p. 214. In his late works, Castoriadis, based on the abovementioned conclusions, was reflecting deeply on the symptoms of his contemporary western world, such as the decline of original work of arts, the academic repetition of the same philosophical thoughts, the general political conformity etc (see C. Castoriadis, The Retreat from Autonomy: Postmodernism as Generalized Conformism, in *World of Fragments*, pp. 23-4). Besides, without accepting consciously natural temporality as radical otherness, the accomplishment of social autonomy is inevitably excluded.
[331] C. Castoriadis, *The Imaginary Institution of Society*, p. 213

ontological genesis with the form of creation *ex nihilo*, depicting the emergence of self-instituting and self-instituted society.

5.3. Creation as the form of ontological genesis

5.3.1. Elaborating the ex nihilo essence

Concerning its very essence, the idea of immanent creation is indeed associated with novelty, with a figure absolutely new emerging. As such, whereas denying mere unforeseeability[332], "*novelty is the undeducibility and the unproducibility, that is to say, the unconstructibility of X on the basis of the whole prior situation*"; "*this "whole prior situation" always gives you the necessary conditions; yet those conditions, in the cases that interest us – where there is something new – are not sufficient, whence the novelty of what is created qua form, qua eidos*"[333]. What is more, "*creation means, precisely, the* positing of new determinations – *the emergence of new forms,* eide*, therefore* ipso facto *the emergence of new laws – the laws appertaining to these modes of being*" [334].

In order to elucidate the essence of creation ex nihilo as the form of ontological genesis[335], Castoriadis draws the distinction between difference and otherness.

On the one hand, difference describes the ontological situation, in which a figure derives from another figure, as a product in different arrangement, based on identitary laws. That is the case under the light of the inherited ontology, by which, due to atemporality, creation is impossible; thus, any ontological change is grounded production, i.e. on the derivation from another being[336].

On the other hand, otherness describes the ontological situation, in which a figure cannot derive only from another previous figure and no identitary laws are sufficient to explain it. In other words, creation *ex nihilo* is addressed when a new figure is not produced from a past figure, but "*comes from* nothing *and out of* nowhere*, it does not have a* provenance *but is an* advent"[337]. That is to say, there cannot be an identifiable rational connection between the ontological sequences, because every time figures are emerging and cannot be fully related to the past instances, even if they originated from them. Therefore, inside radical otherness – and not plain difference – exists the potential of creation *ex nihilo*.

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[332] C. Castoriadis, False and True Chaos, p. 388, where the example of the roulette and of quantum phenomena as unforeseeable, yet determinate, is displayed: "*If you play roulette, you're perhaps going to hit 27. That's unforeseeable, but it's not new: that number has already been hit billions of times. It's not the unforeseeable that is new, and it's not indetermination as such that yields novelty. When one arrives at the reduction of the wave packet, quantum phenomena are in a sense indeterminate; they can yield nothing but probabilities, yet they are not new. It's always those miserable protons or electrons that you're going to find.*"

[333] C. Castoriadis, False and True Chaos, p. 388

[334] C. Castoriadis, Done and To Be Done, p. 369

[335] In the related literature, the term "*demiourge*" – a derivative from the Greek word 'δημιουργία' – is often used.

[336] C. Castoriadis, *The Imaginary Institution of Society*, p. 195-6

[337] C. Castoriadis, *The Imaginary Institution of Society*, p. 195

Furthermore, Castoriadis claims that the medium of ontological genesis lies with creative imagination ('kreative Einbildungskraft'), which derives from radical imaginary [338]. Methodologically, creative imagination opposes productive imagination ('produktive Einbildungskraft'), as acknowledged by I. Kant[339], who albeit a truly pioneering spirit still denied creation. The antithesis stands on the assertion that productive imagination explains social difference by producing only the same forms, waiting to be disclosed; nevertheless, such claim would reduce history not to creation, but to repetition, presented "*as a physical, logical or ontological 'elsewhere'*"[340].

In addition, it is critical to underline again that creation does not mean non-determination, since "*the mode of being of the indeterminate itself is not purely and simply indeterminate*"[341]. This implication stands exclusively in the sense that "*the totality of what is is never so totally and exhaustively 'determined' that it might exclude (render impossible) the surging forth of new determinations*"[342]. Given that, since new forms are and will be emerging either way due to Chaos and temporal succession, the Being is constantly determining and determined – and, to be more precise, self-determining and self-determined: the determining capacity of radical imaginary as *vis formandi* never exhausts the world, but still manages to formulate it to some possible extent[343]. After all, "*whatever its specific makeup and whatever the degree of internal indetermination it includes, every form (therefore also every new form) is a* being-this *and a* being-thus"; and "*as a matter of fact, this determination that the creation of forms is ensures that chaos will always also present itself as cosmos, that is to say, as organized world in the broadest sense of the term, as order*" [344].

Furthermore, when applying this conclusion to social imaginary, society is revealed simultaneously as self-instituted and self-instituting, is the maker and the subject of social life, never ceasing to alter itself[345]. To that end, Castoriadis observes that "*each time instituting society erupts within society as instituting, each time society as instituting is self-destructed by society as instituting, that is to say each time another instituted society is self-created*"[346]. Thus, "*structures […] wear themselves away by being used*", as time is powerful enough to erode any institution[347]. But simultaneously, this erosion – possibly originating from some source of entropy – is the prerequisite of creation. That is the reason, why the most iconic examples of creation in the social-

[338] C. Castoriadis, *The Imaginary Institution of Society*, p. 146
[339] See the discussion below.
[340] C. Castoriadis, *The Imaginary Institution of Society*, p. 198-9
[341] C. Castoriadis, Done and To Be Done, p. 369
[342] C. Castoriadis, Done and To Be Done, p. 369, where Castoriadis also explicitly states that "*it is a logical error to think […] that due to this fact one must replace this hypercategory [*determinacy*] with the idea of absolute and complete indetermination*".
[343] For that point, see also Logic, Imagination Reflection, p. 261, where inspiration is drawn from the Heraclitean flux.
[344] C. Castoriadis, False and True Chaos, p. 389
[345] C. Castoriadis, *The Imaginary Institution of Society*, p. 201, 373
[346] C. Castoriadis, *The Imaginary Institution of Society*, p. 201
[347] C. Castoriadis, *The Imaginary Institution of Society*, p. 216

historical field are a catastrophe or a revolution[348], in which cases the irruptive creation of other institutions is consciously and directly observable[349].

5.3.2. Constraints

However, even if creation *ex nihilo* arises indeed as the only ontological means, based on which Being becomes determinable, the concept itself is subject to vast limitations. Generally put, when addressing creation *ex nihilo*, Castoriadis rejects the similar, but troublesome, notions of creation *cum nihilo* or *in nihilo*.

Albeit asserting the principal creating capacity of imaginary, Castoriadis never claims that an ontological figure or a social institution would emerge freely, bound to nothing except for the imaginary capacity; on the contrary, albeit suddenly appearing somewhere, they are creations taking place under significantly restricting constraints, surging forth by means of things[350]. In that sense, nothing can happen "*just anywhere, just any time and just anyhow*"[351], meaning unbound to any constraints; that would only lead to creation *cum nihilo* or *in nihilo*, which would end up merely in addressing pseudo-creation in the form of 'revelation', as adopted by Platonic or religious texts[352].

Specifically concerning its limitation, the scope of creation ex nihilo is susceptible to external, internal, historical and intrinsic constraints.

Firstly, the 'external' constraints are "*imposed by the first natural stratum, including the biological constitution of the human being*"; for, even if society is not caused by it, still it "*is, each time, conditioned by its 'natural' habitat*"[353]. That being said, "*as the first natural stratum exhibits, to a decisive degree, an ensemblistic-identitary dimension - two stones and two stones make four stones, a bull and a cow will always produce calves and not chickens, etc. - the social institution has to recreate this dimension in its 'representation' of the world, and of itself*"[354]. After all, being present in language, this dimension "*corresponds to language as* code*, that is, as a quasi-univocal instrument of making/doing, reckoning and elementary reasoning*"[355]. Hence, "*to these 'external'*

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[348] C. Castoriadis, *The Imaginary Institution of Society*, p. 201

[349] It goes without saying that self-alteration through creation *ex nihilo* proceeds, regardless of its conscious perception by human beings.

[350] C. Castoriadis, False and True Chaos, p. 389

[351] C. Castoriadis, Done and To Be Done, 1989, In: Curtis D.A., *The Castoriadis reader*, Oxford: Blackwell Publishers Ltd, 1997, p. 370.

[352] After all, according to Castoriadis, "*creation in theology is obviously merely a pseudo-creation; it is producing or manufacturing*" (C. Castoriadis, *The Imaginary Institution of Society*, p. 196). See also C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 3, where is stated that "*creation as such and proper was never considered in theology*" because "*theological "creation" is just a word; philosophically speaking, it is a misnomer for what is in truth only production, fabrication, or construction*"; nonetheless, even if "*God is a Maker or a Craftsman who looks at the preexisting* eidé *(forms) and uses them as models or paradigms in shaping matter*", still "*does not create* eidos*, neither in Plato nor in any rational theology*" .

[353] C. Castoriadis, Radical Imagination and the Social Instituting, p. 333

[354] C. Castoriadis, Radical Imagination and the Social Instituting, p. 333

[355] C. Castoriadis, Radical Imagination and the Social Instituting, p. 333

constraints responds the functionality *of institutions, especially relative to the production of material life and to sexual reproduction*" [356].

Secondly, the 'internal' constraints are relative to the human psyche, as the "*'raw material' out of which society creates itself*"[357]. On the one hand, "*the psyche has to be socialized and for this it has to abandon more or less its own world, its objects of investment, what is for it meaning, and to cathect socially created and valued objects, orientations, actions, roles, etc.*", for "*the social institution can make out of the psyche whatever it pleases – make it polygamous, polyandrous, monogamous, fetishistic, pagan, monotheistic, pacific, bellicose, etc.*"; on the other hand, that is possible only under the condition that "*the institution supplies the psyche with* meaning – *meaning for its life and meaning for its death*"[358]. Hence, there arises an internal necessity for religious imaginary significations that "*tie together the meaning of the individual's life and death, the meaning of the existence and of the ways of the particular society, and the meaning of the world as a whole*"[359].

Thirdly, the 'historical' constraints spring from the supposition that, despite that "*we cannot fathom the 'origin' of societies*", still "*no societies we can speak of emerge* in vacuo*", for "there are always, even if in pieces, a past and a tradition*"[360]. Nonetheless, the important point is that "*the relation to this past is itself a part of the institution of society*" to the extent that in some cases "*the 'reception' of past and tradition is, partly at least, conscious – but this 'reception' is, in fact, re-creation*" [361]. Hence, historical constraints originate from the pre-existing tradition, from which every creation comes forth and which every institution partially incorporates. It is also worth to point out that "*this re-creation is, of course, always done according to the imaginary significations of the* present *– but, of course also, what is 'reinterpreted' is a given, not an indeterminate, material*" [362].

Finally, the 'intrinsic' constraints are roughly divided in two major categories. On the one hand, "*institutions and social imaginary significations have to be* coherent", meaning "*relative to the main characters and 'drives' of the given society, taking into account the conformal behaviour*

[356] C. Castoriadis, Radical Imagination and the Social Instituting, p. 333
[357] C. Castoriadis, Radical Imagination and the Social Instituting, p. 334
[358] C. Castoriadis, Radical Imagination and the Social Instituting, p. 334
[359] C. Castoriadis, Radical Imagination and the Social Instituting, p. 334
[360] C. Castoriadis, Radical Imagination and the Social Instituting, p. 334
[361] C. Castoriadis, Radical Imagination and the Social Instituting, p. 334. To that point, Castoriadis provides the following historical examples: characteristically, "*Athenian tragedy 'receives' Greek mythology, and it re-creates it*"; moreover, "*the history of Christianity is but the history of continuous 'reinterpretations' of the same sacred texts, with amazingly differing outcomes*"; and finally, "*classical Greeks have been the object of an incessant 'reinterpretation' by the Western Europeans since the thirteenth century*".
[362] C. Castoriadis, Radical Imagination and the Social Instituting, p. 334-5. An elucidating example is drawn by comparing transculturally the reception of the same Greek heritage: "*The Byzantines just kept the manuscripts, adding some scholia here and there*", "*the Arabs used only the scientific and philosophical texts, ignoring the rest*", while "*the Western Europeans have been struggling with the remnants of this heritage for eight centuries now, and do not seem to be through with it*".

of the socialized individuals, etc."[363]. What is more, even without precluding "*internal divisions, oppositions, and strife*", "*coherence is not, generally, endangered by 'contradictions' between the strictly imaginary and the ensemblistic-identitary dimensions of the institution for, as a rule, the former prevail over the latter*"[364]. Therefore, despite that identitary- ensemblistic logic cannot by itself create meaning or institutions, its mechanisms intrinsically resist arbitrary formulation, while guiding the hand of the imaginary *vis formandi*. On the other hand, "*institutions and social imaginary significations have to be* complete" and posited in a quasi-mathematical *closure*[365]. This element is mostly projected in a heteronomous, closed society, where "*any 'question' which can be formulated at all in the language of this society must find its answer within the magma of the social imaginary significations of the society*"; and especially "*questions concerning the* validity *of the social institutions and significations cannot be posed*" due to "*a* transcendent*, extrasocial, source of the institutions and significations, that is, religion*"[366]. In any case, however, this *completeness*, along with its corresponding *coherence*, highlights the identitary-ensemblistic dimension of creation as critical for its logical development, as the vessel that can lead an emerging figure to its compatibility with the rest of the world.

Under the light of these thoughts, ontological genesis approaches *mutatis mutandis* the moment when a work of art is created. Iconic is the example of the sculptor and the statue: "*Now bronze* is *bronze regardless of its form. But the statue is a statue only due to its form; its being-a-statue, its essence,* is *eidos. So, to say that someone creates the statue (ontologically) is meaningful only if we say (which is true, at least for the sculptor who is not copying any other sculptor) that someone creates the* eidos *of the statue, that what is created* is *the* eidos. *The statue is* brought into being *as a statue and as this particular statue only if its* eidos *is invented, imagined, posited out of nothing*"[367]. Hence, despite the fact that every artistic creation emerges from the already existing material with specific, unchanging properties (e.g. quantity, quality etc.), nevertheless imagination intervenes and, as a result, the final creation exceeds its material sources in terms of intellectual content and social meaning – in a word, is *other*. Accordingly, the impact of radical imaginary on the social-historical field results in the emergence of social institutions; however, instead of material prerequisite, institutions require a pre-existing tradition, from which they emerge as other and, thus, obtain concrete and independent ontological weight. Therefore, as either a work of art or an institution, when a product of the human imagination exceeds the current limits of being, it constitutes a creation ex nihilo[368].

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[363] C. Castoriadis, Radical Imagination and the Social Instituting, p. 335. The example hereto provided is drawn by ancient Egypt and Maya, when "*pyramid building with starving peasants is coherent when referred to the whole organization and social imaginary significations of the Pharaonic or Mayan societies*".

[364] C. Castoriadis, Radical Imagination and the Social Instituting, p. 335. For instance, ironically "*arithmetic and commerce have not been hampered in Christian societies by the fundamental equation 1 = 3 implicit in the dogma of the Holy Trinity*".

[365] C. Castoriadis, Radical Imagination and the Social Instituting, p. 335

[366] C. Castoriadis, Radical Imagination and the Social Instituting, p. 335-6

[367] C. Castoriadis, *The Imaginary Institution of Society*, p. 197)

[368] Of course, contrary to aesthetics, the ontology of society is *in abstracto* morally indistinct. Specifically put, "*an ontological investigation oriented toward the idea of creation leaves room, in the most abstract way, for the possibility of the instauration of an autonomous society as well as for the reality of Stalinism and Nazism"; "at this level, and*

Ultimately, creation *ex nihilo* stresses the claim that ontological figures along with social significations and institutions are indeed formulated from what was already there, but do not bear any identitary connection with their sources – else, with their *arche*. That said, apart from the fact that they relate to and spring from an already existing tradition, their final content is other, distinct from its sources and, only to that point, freely created. And even if some kind of causal connection does exist, creation *ex nihilo* points to the fact that this connection is neither determinable, nor explicable by any causal law[369]. That is the case, in spite of the fact that some local or sectoral law does exist and may even precede or support the concept of imaginary creation[370]. Thus considered, "*insofar as they are neither causally producible nor rationally deducible, the institutions and social imaginary significations of each society are free creations of the anonymous collective concerned*"[371]; and while the conditions for the emergence of a novel figure are indeed necessary, but never sufficient, the strict rational analysis of its ontological succession remains meaningless[372].

5.4. Concluding remarks: Formulating ontological reality under constraints

In conclusion, creation ex nihilo transcends as the vessel of radical and instituting imaginary, through which the image evoked becomes a part of social and even natural reality – to the extent possible. Following this chapter, it is herein acknowledged that, contrary to traditional logic, human imagination as 'kreative Einbildungskraft' and vis formandi formulates the Being and makes possible for novel forms to emerge; that the prerequisite ontological milestones lie with the chaotic element and the genuine temporal succession, which reveal a constantly determining force that deeply relates with the Heraclitean flux; that on the social level creation ex nihilo is projected as the instituting force, according to which any society is self-created as a constantly self-instituting and self-instituted collective organization; and, finally, that despite its capacity creation ex nihilo is bound to strict restrictions on many parallel levels, thus instated as neither cum nihilo, nor in nihilo.

Given these standpoints, in addition to opening the door to the realms of metaphysics imagination is capable of formulating the reality. However, we are obliged to wonder, to what

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almost all others, creation has no value content, and politics does not allow itself to be 'deduced' from ontology" (C. Castoriadis, Done and To Be Done, p. 361-2). For, as Athenian democracy and the assembly of People ('*Ecclesia tou Dimou*') are created, so are concentration camps, such as Auschwitz and Gulags. Therefore, that institutions are emerging *ex nihilo* leads in advance to neither positive, nor negative reception.

[369] In all fairness, although no identitary law is able to determine the cases of radical otherness, Castoriadis introduces the concept of *essential indetermination* (C. Castoriadis, *The Imaginary Institution of Society*, p. 199). That said, the inability to determine the ontological difference is not absolute, because certain properties of the past figures would persist in existing. However, this supposition does not lead to founding the succession of events strictly on determinable causal relations, but rather the contrary; *"for, if time is truly otherness-alteration, it is out of the question that, at any given moment, the group of essential determinations of what exists can be considered as closed"* (C. Castoriadis, *The Imaginary Institution of Society*, p. 200). Therefore, any causal justification of the ontological genesis is still rejected.

[370] C. Castoriadis, Complexity, Magmas, History-The example of the medieval city (in Greek), p. 329

[371] C. Castoriadis, Radical Imagination and the Social Instituting, p. 333

[372] See again C. Castoriadis, False and True Chaos, p. 388

extent society may function as a self-instituting and self-instituted organism. For when this imaginary formulation is applied to each ontological stratum, the degree, based on which reality remains feasibly formable, differs, explaining thusly the multilayered set of constraints contra creation that resist formulation – albeit its ex nihilo origins. For example, in regard to the first natural stratum, the applicability of imagination as vis formandi is, as already shown, rather limited; on the contrary, from the biological stratum of the living being and hereinafter to the social-historical stratum, the capacity for ontological formulation is gradually expanding. That is the reason we can claim, as above illustrated, that whereas the biological structure of the human body remains unchanged, still its biological behavior is formulated in accordance to the social-historical it resides[373].

In that sense, this thesis adopts the claim that the physical/material realm, traditionally regarded as truly real, manifests only a part of the ontological reality; the rest belongs to the metaphysical/non-material realm, which also bears the capacity to partially formulate – even empirically – the physical realm. That is because the creative force of social imaginary can formulate ex nihilo the natural reality – or its appearance, sensible to humans – to the extent that indeed remains feasibly formable. As such, metaphysics, as introduced through imagination, rises to an ontological – not illusionary – level, tantamount to and corresponding with the empirical and physical sphere. And, as will be shown afterwards, this conclusion becomes quite intriguing when associated with instituted social imaginary significations and philosophy of science.

6. ***The mission of social imaginary: Positing answers to unanswerable questions***

6.1. Approaching the genuine, yet unanswerable, ontological questions

Following the chaotic element embedded in the nature of Being, that same non-determinability passed over to the genuine ontological questions that challenge every psychic monad, every social individual and every social-historical. Historically speaking "*every society up to now has attempted to give an answer to a few fundamental questions: Who are we as a collectivity? What are we for one another? Where and in what are we? What do we want; what do we desire; what are we lacking?*"[374]. It is not without significance that these questions are approaching the primordial ontological essence and, as such, are posing the problematic of the foremost Arche of Being – not only temporally, but also qualitatively. That being said, despite

[373] See below the iconic example concerning food preferences and their biological impact according to the respective social-historical field.

[374] C. Castoriadis, *The Imaginary Institution of Society*, p. 146-7. At the same point, concerning the process, according to which ontological question arise, Castoriadis elaborates as follows: "*Of course, when we speak of 'questions', 'answers', and 'definitions', we are speaking metaphorically. These are not questions and answers that are posed explicitly, and the definitions are not ones given in language. The questions are not even raised prior to the answers.*

asserting Chaos or Apeiron as the primary essence of our Cosmos, some other quality of Being is presupposed, in order to found the own-world of social-historical and its laws.

Ontological questions are chaotic, because they share the same groundless abyss that does not permit any finite answers. As long as the contents of the question are non-determinable, a challenge arises for any answer to be provided. Castoriadis is positing that same topic, wondering "*what is the question itself and the question generally*"; and he adds poetically that thinking for an answer "*does not mean that we exit the cave*", but that "*we enter into the Labyrinth, specifically we make to be and appear a Labyrinth*"[375]. Especially on the social-political topic, the seemingly simple "*question of what a just law is, what justice is – what 'the proper' institution of society is – opens up as a genuine, that is, interminable, question*" [376]; therefore, "*philosophical interrogation leads rapidly to the question not only of whether this or that representation of the world is true, but of what truth is*"[377].

Given these suppositions, genuine ontological questions are actually unanswerable, because "*they must remain open forever*"[378]. Of course, as already abovementioned, it is exactly because of this openness that any non-finite answer ontologically precedes the creation of philosophy and politics. That is because, if the world were fully ordered, "*there would not be any philosophy, but only one, final system of knowledge*"; "*and if the world were sheer chaos, there would be no possibility of thinking at all*"[379]. What is more, "*if the human world were fully ordered, either externally or through its own 'spontaneous operation', if human laws were given by God or by nature or by the 'nature of society' or by the laws of history', then there would be no room for political thinking and no field for political action and no sense in asking what the proper law is or what justice is*", while "*if human beings could not create some order for themselves by positing laws, then again there would be no possibility of political, instituting action*" [380].

In addition to this non-determinable prerequisite, Castoriadis most importantly and tragically ascertains that, although a finite or even a probable answer is impossible, nonetheless "*society must define its 'identity', its articulation, the world, its relations to the world and to the objects it contains, its needs and its desires*"; that is because "*without the 'answer' to these 'questions', without these 'definitions', there can be no human world, no society, no culture - for everything would be an undifferentiated chaos*"[381]. Hence, "*society cannot evade the question: Why this norm rather than that*?" [382].

In that sense, despite that the answer to such genuine principal question can never be finite and terminable, every social-historical must provide 'some' possible answer to this question. That

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[375] C. Castoriadis, Preface (in French), p. 5-6

[376] C. Castoriadis, The Greek Polis and the Creation of Democracy, p. 282. See also C. Castoriadis, Physis and Autonomy, p. 340, where Castoriadis is also wondering that "*if we ourselves, explicitly, make our laws, what laws ought we to make?*", thus marking "*the entire basis for the genuine political question*".

[377] C. Castoriadis, The Greek Polis and the Creation of Democracy, p. 272

[378] C. Castoriadis, The Greek Polis and the Creation of Democracy, p. 272

[379] C. Castoriadis, The Greek Polis and the Creation of Democracy, p. 274

[380] C. Castoriadis, The Greek Polis and the Creation of Democracy, p. 274

[381] C. Castoriadis, *The Imaginary Institution of Society*, p. 147

[382] C. Castoriadis, The Greek Polis and the Creation of Democracy, p. 282

answer is not merely a surplus, but it is rather an indispensable prerequisite for the formulation of the social structure, which remains essential for reasons of survival[383]. And even if not subject to, still any ontological question demands an answer that would be conventionally adopted as *quasi* finite and definite. What is more, inasmuch as this answer would posit the Arche of Being, it cannot be logically grounded[384], because that answer precedes the development of the identitary-ensemblist logic and the rational laws. Consequently, since it is imperative to posit and answer a genuine ontological question and since a logically correct answer cannot be provided, the answer provided by any social-historical is only being rendered *arbitrary* – meaning not random or blind, but not rationally founded.

An iconic example of a principal ontological question that demands a finite answer is the problematic on the existence of God. That is because God is elevated to the highest peak of every social hierarchy, from which the arche originates and around of which institutions are correspondingly forged. And despite the commonly accepted conclusion, even by massive religion beliefs, that the entity of God surpasses the limits of human understanding and cannot thusly be determined, still every social-historical provides – and is obliged to provide – some king of answer. What is rather intriguing is the fact that from a simple historical retrospect any answer existed, though arbitrary, has been socially meaningful – be it positive (Gnosticism), negative (Atheism) or neutral (Agnosticism).

This situation, where there cannot be a logically right or wrong answer, but still an answer is demanded, is in its essence tragic. As such, this constant and unsolvable impasse was being portrayed in the Athenian tragedy, as it constituted its ontological grounding. According to Castoriadis, "*what tragedy, not 'discursively' but through* presentation*, gives to all to see, is that Being is Chaos*"; "*Chaos is exhibited here, first, as the absence of order* for *man, the lack of positive correspondence between human intentions and actions, on one hand, and their result or outcome, on the other*"; "*more than that, tragedy shows not only that we are not masters of the consequences of our actions, but that we are not even masters of their* meaning"; "*Chaos is also presented as Chaos in man, that is, as his* hubris"; consequently, it is concluded that "*the ultimately prevailing order is, as in Anaximander, order through catastrophe – a 'meaningless' order*"[385].

The most iconic and profound example lies with *Antigone* by Sophocles (442 BCE), where it is explicitly stated that the praise is granted to "*the one who is able* to weave together (pareirein) *'the laws of the land and the justice of gods to which he has sworn'*"; when "both *Creon* and *Antigone insist on their own reasons, without listening to the reasons of the other*"[386], they commit *hubris*, since they are insisting on "monos phronein, *'being wise alone'*"[387], without weaving together the reasoning of the confronting side. Nonetheless, since these two sides are directly colliding and non-negotiable between Antigone and Creon, their conciliation, though essential, is rendered vain. In the end, Castoriadis asserts that *Antigone* "*exhibits the uncertainty pervading the*

[383] See again above the essentiality of society and socialization for the human species.
[384] C. Castoriadis, *The Imaginary Institution of Society*, p. 147
[385] C. Castoriadis, The Greek Polis and the Creation of Democracy, p. 285
[386] C. Castoriadis, The Greek Polis and the Creation of Democracy, p. 285
[387] C. Castoriadis, The Greek Polis and the Creation of Democracy, p. 286

field [of political action], it sketches the impurity of motives, it exposes the inconclusive character of the reasoning upon which we base our decisions"[388].

Therefore, "*we cannot get rid of nous – even if we know its insufficiencies, its limits*"[389]. The social-historical must answer. And its answers are provided via significations and symbols by its social imaginary that constitute the social imaginary significations and the social institutions.

6.2. Instituted social imaginary significations: The answers provided by the social-historical

6.2.1. Significations and institutions: Definitions

In terms of definition, **social imaginary significations** are "*like the final articulations the society in question has imposed on the world, on itself and on its needs*"[390]. More descriptively, they can be grasped "*as the invisible cement holding together this endless collection of real, rational and symbolic odds and ends that constitute every society, and as the principle that selects and shapes the bits and pieces that will be accepted there*"[391]. These significations are, on the one hand, imaginary "*because they do not correspond to, or are not exhausted by, references to "rational" or "real" elements and because it is through a creation that they are posited*"; on the other hand, they are social "*because they are and they exist only if they are instituted and shared by an impersonal, anonymous collective*"[392]. Hence, originating by human via *nomos*, social imaginary significations provide the essential order that organizes the preexisting chaotic situation and allows the emergence of the social structure and, thus, of the human world[393]. And it is only through social significations that this order allows the Being to be perceivable by humans, as it must be firstly organized and, thus, bounded[394].

Moreover, social imaginary significations are "*embodied in and through its [society's] institutions*"[395]. **Institutions** are "*a socially sanctioned, symbolic network in which a functional component and an imaginary component are combined in variable proportions and relations*"[396]. In terms of content, institutions are perceived under the widest possible meaning, ranging from language, religious notions and political principles to working habits and food preferences[397]. Given

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[388] C. Castoriadis, The Greek Polis and the Creation of Democracy, p. 286
[389] C. Castoriadis, Preface (in French), p. 27
[390] C. Castoriadis, *The Imaginary Institution of Society*, p. 143
[391] C. Castoriadis, *The Imaginary Institution of Society*, p. 143
[392] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 8. After all, imaginary significations may only be social, because the psychic monad, when shattered and socialized, cannot provide on itself the answers that its social-historical poses.
[393] C. Castoriadis, *The Imaginary Institution of Society*, p. 147
[394] C. Castoriadis, *The Imaginary Institution of Society*, p. 145, 146, 149
[395] C. Castoriadis, Done and To Be Done, p. 363
[396] C. Castoriadis, *The Imaginary Institution of Society*, p. 132
[397] C. Castoriadis, *The Imaginary Institution of Society*, p. 150. Especially concerning food preferences, the following is stated: *"This cultural sampling among available foods and the corresponding hierarchization, structuring, etc. are*

that, Castoriadis focuses on the symbolic role of the institution, insofar as they "*cannot be reduced to the symbolic but they can exist only in the symbolic*"[398]. Thus, "*the imaginary has to use the symbolic not only to 'express' itself (this is self-evident), but to 'exist', to pass from the virtual to anything more than this*"[399]. However, the conversed deduction, according to which the imaginary precedes the institution and is pre-required for its creation, is simultaneously valid; for "*symbolism too presupposes an imaginary capacity […] to see in a thing what it is not, to see it other than it is*"[400]. As a result, whereas social institutions are the symbolic embodiment of social imaginary significations, they are not reduced to mere vessels, since their functional motive is surpassed[401]; and although Castoriadis accepts that "*institutions fill vital functions without which the existence of society is inconceivable*"[402], he claims that still "*a symbol never imposes itself with a natural necessity, but neither does it ever lack all reference to reality*"[403]. Hence, inasmuch as "*the 'choice' of a symbol is never either absolutely inevitable, or merely haphazard*"[404], society creates its symbolical institutions not with total freedom, but "*bound up with nature […] and with history (with what is already there)*"[405]. And instead of becoming at least somewhat determinable, on the contrary "*links emerge between signifiers, relations between signifiers and signified, connections and consequences emerge which were neither intended nor foreseen*"[406]; that is because "*by its virtually unlimited natural and historical connections, the signifier always goes beyond a strict attachment to a precise signified and can lead to completely unexpected realms*"[407].

Therefore, as neither dependent only from functionality, nor really or logically implied by functional rules, institutions are drawing their source from the social imaginary and are created autonomously in regard to the circumstances they aimed to symbolize[408]. In that sense, Castoriadis

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leaning on natural givens, but they do not stem from them. It is social need that creates scarcity as social scarcity, and not the opposite […].One has only to draw up the catalogue of everything that humans can eat, and actually have eaten (not feeling any the worse for it) in different periods and in different societies, to see that what is edible for humans far exceeds what each culture has taken as its food, and that what has determined this choice has not been simply natural availability and technical possibilities." Hence, although natural circumstances are a decisive factor for what is edible and available, it is not enough to determine the actual instituting of food preferences in a society. Given that, it is inexplicable, why *sushi* and *sashimi* in Japan are highly regarded as an exceptional delicacy, while in other parts of the world the image of eating raw fish is enough to provoke vomiting. Therefore, despite the common biological structure of human beings, biological behavior depends on the social imaginary and the corresponding social institutions, while standing in accordance to the limits of natural structure.

[398] C. Castoriadis, *The Imaginary Institution of Society*, p. 117

[399] C. Castoriadis, *The Imaginary Institution of Society*, p. 127

[400] C. Castoriadis, *The Imaginary Institution of Society*, p. 127

[401] C. Castoriadis, *The Imaginary Institution of Society*, p. 129

[402] C. Castoriadis, *The Imaginary Institution of Society*, p. 116. See also C. Castoriadis, *The Imaginary Institution of Society*, p. 131, where the same concept arises from the connection of the imaginary with the symbolic and the functional: "*This imaginary must be interwoven with the symbolic, otherwise society could not have 'come together'; and have linked up with the economic-functional component, otherwise it could not have survived*".

[403] C. Castoriadis, *The Imaginary Institution of Society*, p. 118

[404] C. Castoriadis, *The Imaginary Institution of Society*, p. 118

[405] C. Castoriadis, *The Imaginary Institution of Society*, p. 125. See also the problematic concerning the constraints of creation as abovementioned.

[406] C. Castoriadis, *The Imaginary Institution of Society*, p. 125

[407] C. Castoriadis, *The Imaginary Institution of Society*, p. 121

[408] C. Castoriadis, *The Imaginary Institution of Society*, p. 121, 123, 129, 131

denies the source and nature of institutions, as viewed from the prevailing economical-functional point of view[409]; and actually, insofar as this supposition had been a constant parameter not only for capitalists, but also for Marxists[410], he categorically rejects one of the most common fundamental references of historical materialism.

Concerning the principal ontological questions elaborated above, Castoriadis claims that "*the role of imaginary significations is to provide an answer to these questions*"[411]. However, since functionalism and logicism are denounced, it is an answer that "*obviously neither 'reality', nor 'rationality' can provide*"[412]; for, as social imaginary precedes rationality, social significations cannot be rationally founded, nor rationally nullified, thus rendered "*irreducible to functionality or 'rationality'*"[413]. In that sense, even if "*no society can exist that does not organize the production of its material life and its reproduction as a society*", still "*none of these organizations is or can be inescapably dictated by natural laws or by rational considerations*"[414]. What is more, not only significations as their meaning, but not even the institutions as their symbols are not strictly subject to rational laws or fulfilling functional prerequisites. Besides, it is worth to recall that social imaginary, which serves as the source for both of them, is indeed a vis formandi, yet a non-causal one. Therefore, even if the social-historical creates autogenously an answer via a social imaginary signification, symbolized through a social institution, this could not mean that the answer is logically grounded; it is posited by social imaginary and, from that perspective and only, it remains 'arbitrary'.

Lastly, since instituted social significations are embedded to individuals through their socialization, they do rupture the monadic closure of the psyche and replace its representations[415], thus providing the individual with the meaning it was seeking. After all, "*psyche demands meaning, but society makes it renounce (though never completely) what for the psyche is its proper meaning and forces it to find meaning in the [social imaginary significations] and in institutions*"[416]; thus considered, "*the human individual, be that individual scientific (or philosophic) […] exists only as*

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[409] C. Castoriadis, *The Imaginary Institution of Society*, p. 115-6). For details on functionalism, see C. Castoriadis, *The Imaginary Institution of Society*, p. 386 (n. 1), where there is a quote from Bronislaw Malinowski, according to which "*the functional view of culture insists therefore upon the principle that in every type of civilisation, every custom, material object, idea and belief fulfils some initial function, has some task to accomplish, represents an indispensable part within a working whole*". See also B. Malinowski, 1944, The Functional Theory, in *A Scientific Theory of Culture*, University of North Carolina Press: Chapel Hill, p. 159, where is stated that "*functional always signifies the satisfaction of a need*".

[410] C. Castoriadis, *The Imaginary Institution of Society*, p. 386, n. 2

[411] C. Castoriadis, *The Imaginary Institution of Society*, p. 146-7. Concerning again the process, according to which the social historical answers the arising ontological questions, Castoriadis elaborates as follows: *"Society constitutes itself by producing a de facto answer to these questions in its life, in its activity. It is in the doing of each collectivity that the answer to these questions appears as an embodied meaning; this social doing allows itself to be understood only as a reply to the questions that it implicitly poses itself."*

[412] C. Castoriadis, *The Imaginary Institution of Society*, p. 147

[413] C. Castoriadis, Done and To Be Done, p. 363

[414] C. Castoriadis, *The Imaginary Institution of Society*, p. 145

[415] C. Castoriadis, *The Imaginary Institution of Society*, p. 274. See also S. Adams, p. 86.

[416] C. Castoriadis, Done and To Be Done, p. 379

the product of a perpetual process of socialization", for "*it is first and foremost a walking fragment of the institution of society in general and of* its *particular society*"[417].

6.2.2. The arising dyadic ontology

The ontology of social imaginary significations requires further elucidation. Fundamentally Castoriadis infers that "*the institution of society and the social imaginary significations embedded in it deploy themselves always along two, indissociable dimensions: the "ensemblistic-identitary" ("set-theoretical," "logical") dimension and the strictly or properly imaginary dimension*"[418]. That said, their ontology is captured only as *dyadic*, meaning that it intrinsically encapsulates – as harmonized as possible – the two elements for understanding and formulating the human world.

On the one hand, "*in the ensemblistic-identitary dimension, society operates ("acts" and "chinks") in and through "elements," "classes," "properties," and "relations" that are posited as "distinct" and "definite"*"; that is because herein "*the sovereign scheme is that of determination (determinacy or determinateness,* peras*,* Bestimmtheit*)*"[419], which requires that "*everything conceivable be brought under the rubric of determination and the implications or consequences that follow therefrom*"; consequently, "*from the point of view of this dimension, existence* is *determinacy*"[420]. Thus considered, Castoriadis presupposes that "*all effective institutions of society, and all those we might imagine as effective and viable, necessarily include an ensemblistic identitary (ensidic) dimension and that the latter has a certain grasp upon the world, sufficient as to need/usage, otherwise these societies could not exist*"[421].

On the other hand, "*in the imaginary dimension proper, existence* is *signification*"; even though "*they can be "pointed to"*", still significations "*are not determinate*", but "*are indefinitely related to one another in the basic mode of […] "referral": each signification refers to an indefinite number of other significations*", which for their part "*are neither "distinct" nor*

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[417] C. Castoriadis, The Ontological Import of the History of Science, p. 343

[418] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 11

[419] Concerning a historical retrospect of determinacy as *peras* and *Bestimmtheit*, see C. Castoriadis, The Logic of magmas, p. 295, where is claimed as follows: "*In the entire history of philosophy (and of logic) determinacy has functioned as a supreme, but more or less implicit or hidden, requirement. It is relatively less hidden among the ancient Greeks: the* peras*, ('limit', 'determination') that they opposed to the* apeiron *('indeterminate') was, for them, the decisive characteristic of every thing that one can truly speak of, that is to say, that truly is. At the other end of the history of philosophy, in Hegel, the same schema operates just as powerfully, but in a much more implicit manner: it is* Bestimmtheit*, determinacy, that one encounters on every page of the* Science of Logic*, but that is nowhere thematized or made explicit. Here we are speaking about the dominant tendency, the main stream of philosophical thought. One will find, certainly, among the great philosophers, qualifications or restrictions added to this thesis. Already the Pythagorean Philolaos affirmed that all that is is made of* peras *and of* apeiron*, an idea that Plato takes up and enriches when he writes: 'All that can be said to be is made of one and many, and includes growing with it from the outset the* peras *and the* apeiron*'. But the dominant current of philosophy's fixation on determinacy and the determinate is expressed by this, that while it recognizes a place for the indeterminate, for the* apeiron*, the latter is posited as hierarchically 'inferior': what truly is is what is determined, and what is not determined is not, or is less, or has an inferior quality of being*".

[420] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 11

[421] C. Castoriadis, Done and To Be Done, p. 364

"definite"", nor "*connected by necessary and sufficient conditions and reasons*"[422]. This relation of referral "*works mostly through a quid pro quo […] which in the nontrivial cases is "arbitrary" – that is, instituted*"; correspondingly, "*this quid pro quo is the kernel of what I call the* signitive relation *–which is the basis of language – the relation between the sign and that of which the sign is sign*"[423].

As an iconic institution that bears this dyadic ontology, Castoriadis provides the example of language: herein "*the ensemblistic-identitary dimension corresponds to […] "code"*", while "*the imaginary dimension proper manifests itself through what I call "tongue" (*langue*)*"[424]. What is more, this distinction "*is of course not a distinction of "substance" but one of use and operation*"; in that sense, these two ontological dimensions are "*everywhere dense in language and in social life*", meaning that ""*arbitrarily near" to every "point" of language there is an "element" belonging to the ensemblistic-identitary dimension – and also an "element" belonging to the imaginary dimension proper*"[425].

Therefore, despite that social imaginary significations are born by the radical imaginary of their social-historical, still they are not dominated by the imaginary element, but also intrinsically incorporate the identitary-ensemblist logic. Thus equipped with an intriguing dyadic ontology, social imaginary significations have to accomplish their tragic role, to answer the principal unanswerable questions and provide a social imaginary *arche* for the foundation of the human world, in accordance of which the social-historical shall formulate its *Eigenwelt*, its own proper world.

6.2.3. Excursus on language as an institution: Chomsky contra Castoriadis

In terms of language as a social institution, parenthetical insight to our problematic provides the disagreement between Noam Chomsky, the famous American philosopher of language, and Castoriadis on the origins of linguistic meanings and mechanisms.

On the one hand, ascending from biolinguistics[426], Chomsky methodically introduced the concept of universal grammar[427], meaning "*the set of principles hard-wired into the language*

[422] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 11

[423] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 11-2

[424] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 12

[425] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 12. At that same point, while drawing examples from art, Castoriadis ironically claims that "*the most "crazy" surrealistic poem still contains an indefinite amount of "logic" – but "through" this "logic," it materializes the Other of "logic.""*, whereas "*arithmetic and mathematics are everywhere in Bach, but it is not because it contains arithmetic and mathematics that the* Well-Tempered Clavier *is what it is*".

[426] For this term associated with Chomsky, see *The Oxford Dictionary of Philosophy Oxford Paperback Reference*, edited by S. Blackburn, 1996, Oxford University Press, p. 154, where is stated that "*just as physics studies the forms of physically possible processes, so linguistics should study the form of possible human languages*" and "*this would define the limits of language by delimiting the kinds of processes that can occur in language from those that cannot*".

[427] The original ideas by Chomsky were firstly articulated in *Syntactic Structures*, 1957, Mouton de Gruyter, Berlin, and in *Aspects of the Theory of Syntax*, 1965, The MIT Press, Cambridge, Massachussets.

faculty that determine the class of possible human languages"[428]. In Chomsky's own words, "*development of language in the individual must involve three factors: genetic endowment, which sets limits on the attainable languages, thereby making language acquisition possible; external data, converted to the experience that selects one or another language within a narrow range; [and] principles not specific to the Faculty of Language*"[429]. Roughly put, his fundamentals were grounded on the rationalistic suppositions that, firstly, language is a unique evolutionary development of the human species and distinguished from modes of communication used by any other animal species[430]; secondly, that all humans share the same innate, underlying linguistic structure, irrespective of sociocultural differences[431], rejecting thusly any opposite externalist approach by radical behaviorist psychology or empiricism[432]. Given these standpoints, Chomsky suggested that, given the existence of innate linguistic principles, syntactic knowledge is at least partially inborn, based on which he inferred that the primary linguistic data are supplemented by an internal linguistic capacity. In addition, he claimed that the human brain contains a limited set of constraints for organizing language, thus implying that all languages bear accordingly a common structural basis: the set of rules known as 'universal grammar'[433], "*pre-programmed, an innate biological endowment of normal human infants*"[434]. That being the case, "*the grammar of a particular language, then, is to be supplemented by a universal grammar that accommodates the creative aspect of language use and expresses the deep-seated regularities which, being universal, are omitted from the grammar itself*"[435]. Therefore, "*variations such as vocabulary and principles governing word order would be revealed as different applications of the same underlying rules*"[436].

In that sense, Chomsky's linguistics focused majorly on the innate capacity of human brain for language construction, thus rendering it a biological faculty – not a product of general reasoning processes[437]. However, his conception ended up being rather individualistic: "*since having one of these structures is an intrinsic property of a speaker, properties of languages so conceived are determined solely by states of the speaker*", "*there is no room in scientific linguistics for the social entities determined by linguistic communities*"[438]. Therefore, the impact of social-historical world

[428] *The Cambridge Dictionary of Philosophy*, p. 138

[429] Chomsky, Approaching UG from Below, in *Interfaces + Recursion = Language? Chomsky's Minimalism and the View from Syntax-Semantics. Studies in Generative Grammar*, 2007, edited by Hans-Martin Gärtner and Uli Sauerland, Mouton de Gruyter, Berlin, p. 3

[430] J. Lyons, *Noam Chomsky*, 1970, The Viking Press, New York, p. 6. J. McGilvray, *Chomsky: Language, Mind, Politics*, 2014, Polity Press, Cambridge, p. 2-3

[431] J. Lyons, *Noam Chomsky*, p. 7, J. McGilvray, *Chomsky: Language, Mind, Politics*, p. 11. See also *The Cambridge Dictionary of Philosophy*, p. 757.

[432] J. Lyons, *Noam Chomsky*, p. 7

[433] S. Thornbury, *An A–Z of ELT (Methodology)*, 2006, Macmillan Education, Oxford, p. 234

[434] *The Oxford Dictionary of Philosophy Oxford Paperback Reference*, p. 154

[435] Chomsky, *Aspects of the Theory of Syntax*, p. 6. Besides, towards the same point it is argued that "*it is only when supplemented by a universal grammar that the grammar of a language provides a full account of the speaker-hearer's competence*".

[436] *The Oxford Dictionary of Philosophy Oxford Paperback Reference*, p. 154

[437] *The Cambridge Dictionary of Philosophy*, p. 138

[438] *The Cambridge Dictionary of Philosophy*, p. 138

and its resultant social institutions are excluded from any significant role to the structure of language.

It is, of course, this point precisely that Castoriadis partially criticized. As above illustrated, Castoriadis conceptualized language as a primary social institution that bears simultaneously two dimensions, an ensidic and an imaginary. Hence, when it comes to concepts such as 'universal grammar' by Chomsky, he argues that "*the universals of language, other than phonological ones, can concern only the* ensidic *dimension of language, code and not tongue, the instrumental and not the significant properly speaking*"; given that one-sided focus only on language as a code, "*the elementary syntactic structures Chomsky is seeking after simply embody a certain subject/predicate organization and its ramifications*"[439] which would suggest "*an* a priori*, semantically universal tongue*" [440].

That being said, Castoriadis' contra claim points to the fact that Chomsky, following the traditional ontological approach, is projecting the identitary-ensemblist logic, in order to provide answers for social-historical questions. While this ensidic dimension is acknowledged and in no way rejected, still it concentrates mainly on the form rather that the meaningful content; as such, it is accused for not observing the whole ontological problem of language, but merely its ensidic aspect – important as it may be, yet not the only aspect and perhaps not the most important.

In all fairness, Castoriadis would not deny that there is indeed an innate capacity for language in human biology, from which an ensidic understanding may arise. After all, as will be shown below, he acknowledged that in the first natural stratum, being everywhere the same, reside *"common elements" in at least certain articulations […] across diverse societies (in time and in space)*" [441]. These common element are naturally ensidic, not imaginary; nonetheless these alone would not be potent enough to create language without the influence by its social-historical environment. For language does not emerge solely from the first natural stratum, but primarily by the social historical, where, "*reconstituted and instituted by society seems quite different from the ensidic as we encounter it in nature*"[442].

6.3. Concluding remarks: The ontological role of social imaginary significations

In conclusion, following this chapter, it is herein acknowledged that genuine ontological questions, while preceding the formulation of the ensidic logic, remain logically unanswerable, though still demanding an answer, since every human collectivity posits these questions to itself; that social imaginary of every social-historical is granted the capacity to create social imaginary significations in the attempt to provide answers to the ontological questions; that these answers, since instituted – meaning, socially created –, are symbolized in the form of social institutions; that

[439] C. Castoriadis, Done and To Be Done, p. 375
[440] C. Castoriadis, Done and To Be Done, p. 377
[441] C. Castoriadis, The Ontological Import of the History of Science, p. 355
[442] C. Castoriadis, The Ontological Import of the History of Science, p. 356

these instituted significations are bound to a dyadic ontology, because in their corpus the imaginary element is co-existing with ensidic logic; and, finally, that, due to the chaotic nature of the ontological questions, the answers incorporated by the social imaginary significations are not only arbitrary, but also incomplete.

Given these standpoints, this thesis adopts the following arguments regarding the ontological role of social imaginary significations for the hereby problematic.

Firstly, this coexistence of the imaginary element with the ensidic logic in any social signification and institution points to a bridge between the metaphysical and the physical realms, as illustrated above. That is to say, these two areas of ontological reality do not exist separately but are actually conjoint in every aspect of the social-historical structure. Besides, that would precisely explain the assertions that, on the one hand, metaphysics, albeit non-material, may partially formulate – at the extent possible – the physical/material field; and, on the other hand, that the physical resists formulation by the metaphysical, because the former constraints the capacity of the latter towards creative formulation. This conjunction reflects what we regard as dyadic ontology and embodies both of these dimensions not merely as an antithesis, but as an intrinsically organized, yet rather tense, dipole.

Secondly, since the principal ontological questions precede the emergence of ensidic logic, the answers are provided by social imaginary as the a-causal vis formandi; in that sense, they bear primarily social imaginary origins, thusly incorporated in social imaginary significations. That being said, inasmuch as significations are created ex nihilo and remain presupposed for the formulation of logical structures, the answers embodied posit the imaginary Arche of social Being, whereas remaining 'arbitrary'. Of course, this arbitrariness does not point to total indeterminability or chaotic applicability of everything to anything; nonetheless, it does mean that the answers to the principal ontological questions are non-logically grounded, as well as non-logically nullified. After all, due to their dyadic ontology social imaginary significations, when applied, have to be conveniently compatible with – else, constraint by – the respective ensidic logic; however, the need for this compatibility is restrained only in terms of their applicability – not their originary creation.

Thirdly, since the principal ontological questions are non-wholly and non-finitely answerable, any answer provided would be not only 'arbitrary', but at least incomplete. Nevertheless, an answer is still demanded as an ontological presupposition – else, as an *arche* – for any social-historical organism in order to evolve itself and develop its institutional network; what is more, to that same end, this answer, albeit arbitrary and incomplete, must appear as quasi-complete, quasi-finite and quasi-determined. That is because any instituted ontological presuppositions serve as the fundamentals of the social life and, as such, are demanded to stably and orderly organize the social structure – especially against the implicitly, though ever-existing, danger of its demise into chaos.

In any case, insofar as organized order contra chaos is provided, an answer is an answer – capable as quasi-finite and quasi-determined to found the social structure and signify its natural environment world. And since social imaginary significations become the only possible answers, they are elevated to "*constitutive, each time, of its [society's] own, or 'proper', world (both 'natural'*

and 'social')"[443], pointing thusly to the concept of *Eigenwelt*. Beforehand, though, it is elucidating to comparatively position Castoriadis' imagination in the flow of history, as illustrated by the traditional ontological approach.

7. ***Imagination in the history of philosophy: Castoriadis versus the traditional approach***

7.1. Aristotle: 'Phantasia' as the birthplace of imagination

It is with Aristotle that Castoriadis places historically the birth of imagination as a faculty of concrete ontological magnitude, initially named 'phantasia'. In his treatise *De Anima* concerning the essence and the properties of human soul[444], by introducing 'phantasia' Aristotle "*discovers the imagination – and he discovers it twice, that is, he discovers two imaginations*": on the one hand, what Castoriadis calls *second* or *secondary imagination*, on the other hand "*one with a much more radical function, that enjoys almost nothing but a homonymic relation to the previous one*", which he calls *first* or *primary imagination*[445].

As the starting point, Aristotle defined 'phantasia' as the "*movement engendered by sensation in actuality*"[446], meaning a property of the human soul through which "*an image (*phantasma*) is produced in us*"[447]. In other words, "*to imagine means to formulate opinion for what I sense, but not on an ad hoc basis*"[448]. Thus considered, imagination as 'phantasia' is classified among the dianoetic potentialities[449], according to which "*the soul separates and knows any being whatsoever*"[450] and "*we may judge and be found true or false*"[451]. Nevertheless, imagination "*is other than sensation and thought (*dianoia*)*"[452]. On the one hand, 'phantasia' differs from sensation, "*since sensation is always potentiality or actuality (sight or vision), while there are apparitions (*phainétai ti*) independent of this potentiality or actuality – as in dreams we see in our sleep*"[453] or "*visions one can have "with eyes closed""*[454], for "*sensation is always present, but not the*

[443] C. Castoriadis, Done and To Be Done, p. 363

[444] The fragments of the ancient Greek text that are referred in The Discovery of Imagination, pp. 214-245, are adopted as translated by Castoriadis himself in French and their corresponding translation in English by D.A. Curtis. For those that are not therein referred, the translation is mine.

[445] C. Castoriadis, The Discovery of Imagination, p. 214

[446] Aristotle, *De Anima*, 429a, 2-3

[447] Aristotle, *De Anima*, 428a, 1-2

[448] Aristotle, *De Anima*, 428b, 1-2

[449] See C. Castoriadis, The Discovery of Imagination, p. 222 and 224.

[450] Aristotle, *De Anima*, 427a, 21-22

[451] Aristotle, *De Anima*, 428a, 3-4

[452] Aristotle, *De Anima*, 427b, 15-16. It is worth to underline that for Aristotle the distinction between sensation and thought is for granted (*De Anima*, 427b 7-8) as "the sensation of proper sensibles is always true and appertains to all animals, while thought can just as well be false and appertains only to beings endowed with logos (*De Anima*, 427b 12-15).

[453] Aristotle, *De Anima*, 428a, 6-8

[454] Aristotle, *De Anima*, 428a, 17

imagination"[455]; in addition, "*sensations are always true, whereas most of the products of the imagination are false*"[456]. On the other hand, "*neither is imagination thought and conviction* (noésis kai hupolépsis)"[457], because it "*cannot appertain to the type of thought that is always true,* nous *and* epistémé*, since false imaginations exist*"[458]. Besides, "*thought, being other than sensation, is on the one hand imagination, on the other hand conviction*"[459].

Given the abovementioned standpoints, Aristotle partially concluded the topic by affirming the definition given in advance. That being the case, according to Castoriadis 'phantasia' is understood as "*a kind of movement that is impossible without sensation and possible only for sentient beings and for objects of which there is sensation and that the act of sensation can engender a movement that will necessarily be similar to the sensation*"[460]. As such, "*it can be the cause of many actions and passions for the being that has it, and it will be liable to both truth and error*", hence "*the possibility of truth/error for the imagination will differ according to the kind of sensation that is at its origin*"; for "*if it is a question of the first kind of sensation (that of proper sensibles) the imagination will be true if the sensation is present*", whereas "*if it is a matter of the two others, and whether sensation is present or absent, the imagination will be (or could be […]) false, and all the more so the further removed the sensible object is*"[461]. Therefore, since 'phantasia' "*appears to be placed under the complete dependence of sensation, homogeneous with the latter and caused by it*", it is displayed as the "*superfluous doublet*" of sensation, as its function is exhausted to considerably multiplying "*the possibilities of error inherent in the sensation of the comitant object and in those of commons*"[462].

However, after displaying the discrepancies in Aristotle's categorization of 'phantasia'[463], Castoriadis explains the problematic by assuming that in reality "*Aristotle is thinking here simultaneously or alternatively of* two *manifestations or realizations of the* second *imagination without being explicit about and thematizing the difference between them*": on the one hand, imagination as "*a resonance, a generally deformed doublet of sensation or* aura *surrounding it*", serving as "*retention and persistence of sensible "images" and therefore, at bottom, memory*" and as such, remaining "*"determined" from sensibility*"; on the other hand, imagination as "*the capacity to evoke such images* [i.e. phantasms] *independent of all present sensation, including a certain power of recombination […] which is "in our power" and therefore pertains, to employ modern language, to a freedom or a spontaneity and which, should one even want to think of it as "determined" […], would certainly not have its emergence [*surgissement| *be determined by the "movement of sensation in actuality" that it would reproduce*"[464].

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[455] Aristotle, *De Anima*, 428a, 8-9
[456] Aristotle, *De Anima*, 428a, 12-13
[457] Aristotle, *De Anima*, 427b, 17-18
[458] Aristotle, *De Anima*, 428a, 17-19
[459] Aristotle, *De Anima*, 427b, 29-30
[460] C. Castoriadis, The Discovery of Imagination, p. 224
[461] C. Castoriadis, The Discovery of Imagination, p. 224-5. See also Aristotle, *De Anima*, 428b, 17-30.
[462] C. Castoriadis, The Discovery of Imagination, p. 225
[463] C. Castoriadis, The Discovery of Imagination, p. 225-7
[464] C. Castoriadis, The Discovery of Imagination, p. 227

In spite of the abovementioned definition of imagination, Aristotle in the last chapters of his treatise appeared to manifest an ontological shift to his understanding – explicitly or implicitly. Indirectly contrary to the former analysis, he claimed that "*for the thinking soul the phantasms are like sensations*"[465], which explains "*why the soul never thinks without phantasm*"[466]; in that sense, "*the noetic [of the soul] thinks the forms (*eidé*) in the phantasms, and as it is in them that what is to be sought or avoided is determined for it, it moves even in the absence of sensation when it has to do with phantasms*"[467]; besides, "*other times it is through the phantasms or noemata in the soul that, as though it were seeing, it calculates and deliberates about things to come in relation to present things*"[468]. That being said, 'phantasms', being the images evoked by 'phantasia' and albeit formerly attached to sensation as its corollary, are currently extricating themselves from it and become the vessel, through which thinking is accomplished – even through 'phantasms' alone, without any intervention by sensational mediums.

Along to this line of thoughts, Castoriadis suggested that, insofar as "*the soul never thinks without phantasm"*, then "*there is* always *phantasm*" and "*we are* always *imagining*", meaning that "*we can always have, and we indeed always necessarily have, phantasm, independent of a "movement of sensation in actuality"*" and, thus, contrary to the definition primarily given; consequently, this affirmation "*pulverizes the conventional determinations of the imagination […]and renders insignificant the horizon in which they have been posited*"[469]. Furthermore, in the attempt to approach the concept of 'phantasm', Castoriadis conceptualized it as "*image* in absentia *of the sensible object*" that "*functions as the latter's substitute or representative*"[470]. In the language of Modernity, inasmuch as "*thought implies the representation (*Vertretung*) of the object thought by its representation (*Vorstellung*)*", 'phantasm' stands for that representation "*which is like sensation but without the actuality of the effective presence of the object*"; in that sense, in and through a 'phantasm' "*everything that appertains to the* form *of the object, in the most general sense of the word "form," can be given, or, everything of the object can be thought […]*save *its "matter", which is, in any case, the limit of the thinkable*"[471].

What is more, Aristotle continued as follows: "*Knowledge and sensation are divided according to the objects, [relating] inasmuch as they are in potentiality to the objects in potentiality, and inasmuch as they are in actuality to the objects in actuality. But the sensitive and the knowing [elements] of the soul are potentially that very thing, the knowable and the sensible. And they necessarily are either those very things [the knowable and the sensible] or else their forms (*eidé*). But they are not those very things, for it is not the rock that is in the soul, but the form, so that the soul is like the hand, for the hand too is a tool of tools, and thought form of forms and sensation form of sensibles. And since there is nothing, it seems, having-been-separated and apart from sensible magnitudes, the intelligibles (*noeta*) are in the sensible forms, both those that are said*

[465] Aristotle, *De Anima*, 431a, 15-16
[466] Aristotle, *De Anima*, 431a, 17-18
[467] Aristotle, *De Anima*, 431b, 1-4
[468] Aristotle, *De Anima*, 431b, 6-8
[469] C. Castoriadis, The Discovery of Imagination, p. 228
[470] C. Castoriadis, The Discovery of Imagination, p. 228
[471] C. Castoriadis, The Discovery of Imagination, p. 228

*by abstraction and those that are dispositions and affections (*exeis kai pathé*) of sensibles. And this is the reason why if one sensed nothing one could learn and understand nothing; and why, when one thinks (*theorei*), it is necessary that at the same time (*ama*) one contemplate (*theorein*) some phantasm, for phantasms are like sensations, but without matter. The imagination, however, is other than affirmation and negation, for the true or the error is a complexion of noemata*"[472]. Given these assertions, 'phantasms', bound with thought as its immaterial objects and contrary to sensations as neither affirmed nor negated, seem to stand between the fundamental ontological distinction of sensibles and intelligibles.

Following these standpoints, Castoriadis draws the conclusions that, since "*intelligibles are in the sensible form*s", then "*the intellection of intelligibles presupposes that such and such sensible form is given as separate*"; furthermore, since "*nothing can be learned or comprehended without sensation*", then "*phantasm and imagination are what permit* separation – *and also* composition*, or synthesis*"[473]. That is because, whenever we think of something abstract, such as a mathematical object, we must "*separate it from the matter in which it is realized*", yet we cannot conceptualize it "*without presence or presentation*"; and it is precisely 'phantasia' that "*assures this presentation – which is "like a sensation, but without matter" – and the presentation is realized in and through the* phantasma" [474]. Thus seen, Castoriadis asserts that, insofar as "*analysis and synthesis, abstraction and construction, presuppose the imagination*", "*the kind of imagination Aristotle has in mind here is therefore* sensible abstraction*, abstraction* within *the sensible furnishing the intelligible*"; as such, 'phantasia' stands for "*the condition for thought insofar as it alone can present to thought the object as sensible without matter*"[475] and functions as "*separative power within the sensible, abstractive potential presentifying the abstract, universalizing or "genericizing" factor of the given (but always in its shape [f*igure*])*"[476]. Seeing into that scope, 'phantasma' is additionally understood as "*an abstracted […] sensation*", "*separated from the matter of the object but also separated or separable from the other "moments" of the form of the object*"[477]; in that sense, its role is "*not simply mediation between the categories and the* empirical *given*", but to provide "*support for all thought, including the thought of abstracts, relatives, intelligibles, indivisible forms*"[478].

Nonetheless, the properties of imagination cannot be constraint only to separation, inasmuch as the latter is "*indissociable from composition*", as is "*abstraction from construction*" and "*division from unification*"; after all, "*every positing of the one is at the same time division and every division posits the one anew, and in multiple ways*"[479]. As a result, when it comes to the unifying function of imagination, "*it is impossible to talk of action without "deliberation" concerning the future, and of*

[472] Aristotle, *De Anima*, 431b, 24-30, 432a, 1-12
[473] C. Castoriadis, The Discovery of Imagination, p. 229
[474] C. Castoriadis, The Discovery of Imagination, p. 229
[475] C. Castoriadis, The Discovery of Imagination, p. 231
[476] C. Castoriadis, The Discovery of Imagination, p. 229-30
[477] C. Castoriadis, The Discovery of Imagination, p. 229
[478] C. Castoriadis, The Discovery of Imagination, p. 236
[479] C. Castoriadis, The Discovery of Imagination, p. 230

"deliberation" without imagination – that is, without the positing/ presentation of several […] sets of composite or unified "images" of what is not there"[480].

In conclusion, not only implicitly, but also explicitly, Aristotle through 'phantasia' and 'phantasma' approached imagination under a strict ontological scope and accomplished the birth of the primary imagination. Densely described by Castoriadis, "*what the imagination is, and the saying of what it is, is not "coherent" in the sense of any sort of logic or dialectic*", for "*it takes flight in all directions, does not contract into eidos, cannot be-held together*" and "*still less can it be put into place and in its place beside* aisthesis *(sensibility), beside* noesis *(thought)*"[481]. Of course, "*this movement remains essentially limited*", because "*Aristotle does not, and could not, recognize […] in the imagination a source of* creation"; what is more, the problematic was posited "*solely in relation to the subject, within a psycho-logical or ego-logical horizon*", consequently ignoring "*the other dimension of the radical imaginary, the social-historical imaginary, instituting society as source of ontological creation deploying itself as history*"[482]. Nevertheless, in any case, this discovery, non-systematized and obscure as it may be, interrupted not only the logical order of the treatise *De Anima*, but "*of infinitely greater importance, it virtually bursts apart Aristotelian ontology – which amounts to saying, ontology* tout court"; as such, "*it will be ignored in interpretations and commentaries, as well as in the history of philosophy, which will use the discovery of the second imagination to cover up the discovery of the first imagination*"[483].

7.2. Leibniz: 'Blind thought' as the medium between primary and secondary imagination

Being corresponding to some of the aspects of imagination, Gottfried Wilhelm Leibniz introduced the concept of 'blind or symbolic thought' in order to define the kind of reasoning that occurs when "*we do not intuit the entire nature of the subject matter at once but make use of signs instead of things, though we usually omit the explanation of these signs in any actually present thought for the sake of brevity, knowing or believing that we have the power to do it*"[484]. What is more, especially on topics and in circumstances where our senses are not much engaged, human thoughts function for the most part as blind, since "*they are empty of perception and sensibility, and consist in the wholly unaided use of symbols*"; and whereas this symbolic reasoning "*happens with those who calculate algebraically with only intermittent attention to the geometrical figures which are being dealt with*", more importantly "*words ordinarily do the same thing, in this respect, as do the symbols of arithmetic and algebra*", since "*we often reason in words, with the object itself*

[480] C. Castoriadis, The Discovery of Imagination, p. 231
[481] C. Castoriadis, The Discovery of Imagination, p. 218
[482] C. Castoriadis, The Discovery of Imagination, p. 245
[483] C. Castoriadis, The Discovery of Imagination, p. 214-5
[484] Leibniz, Meditations on Knowledge, Truth and Ideas (1684), in *Philosophical Papers and Letters*, vol. 2, translated and edited by L. E. Loemker, 1989, Kluwer Academic Publishers, Dordrecht, p. 292.

virtually absent from our mind"[485]. Therefore, as a rule human reasoning is grounded on blind thoughts, which may retain the findings of reason, but "*are generated by words or signs which have no concrete interpretation*"[486] and, consequently, remain "*devoid of sensible charms*"[487]. ,

According to Leibniz's theorem on knowledge, blind thinking adheres to distinct knowledge that remains adequate, because either "*every ingredient that enters into a distinct concept is itself known distinctly*" or "*analysis is carried through to the end*"; nevertheless, the 'blind' element lies with the fact that, "*when a concept is very complex, we certainly cannot think simultaneously of all the concepts which compose it*" and, hence, "*for the most part we have only symbolic thought of composites*" – especially concerning arithmetic and algebra[488]. Contrary to blind thought stands for Leibniz the intuitive thought, based only on which we may distinctly think of each and every one of the elements that compose a complex concept and perceive the ideas of those things which we know distinctly; therefore, "*there is no other knowledge than intuitive of a distinct primitive concept*", in spite of the fact that we use blind thinking "*indeed almost everywhere*"[489].

Given these standpoints, when the concept of the thing known has been analyzed completely into primary notions and truths, knowledge is adequate and its reasoning is, in turn, either blind/symbolic or intuitive; and even though the human mind may project adequate symbolic knowledge only in the sciences of abstract possibility such as mathematics and logic, it exercises intuitive knowledge only of primary notions and propositions, yet inadequate knowledge in the empirical sciences[490]. Hence, the problem revealed is that through blind thinking "*often we understand after a fashion each single word or remember to have understood it earlier*"; nonetheless, "*because we are content with this blind thinking and do not sufficiently press the analysis of the concepts, we overlook a contradiction which the composite concept may involve*"[491].

Furthermore, insofar as they adhere to a common philosophical field, blind thinking by Leibniz can be dialectically compared with imagination by Castoriadis. Beforehand, it must be underlined that Castoriadis attributes to Leibniz the development of identitary-ensemblist logic[492], which indeed was thoroughly conceptualized during the early period of Modernity; however, by

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[485] Leibniz, *New Essays on Human Understanding*, 1996, edited by P. Remnant and J. Bennet, Cambridge University Press, p. 186

[486] Leibniz, *New Essays*, p. 190

[487] Leibniz, *New Essays*, p. 188

[488] Leibniz, Meditations on Knowledge, Truth and Ideas, p. 292, where the corresponding example for mathematic is stated as follows: "*Thus when I think of a chiliogon, or a polygon of a thousand equal sides, I do not always consider the nature of a side and of equality and of a thousand (or the cube of ten), but I use these words, whose meaning appears obscurely and imperfectly to the mind, in place of the ideas which I have of them, because I remember that I know the meaning of the words but that their interpretation is not necessary for the present judgment."*

[489] Leibniz, Meditations on Knowledge, Truth and Ideas, p. 292

[490] See L. Loemker, Introduction: Leibniz as Philosopher, in *Philosophical Papers and Letters*, p. 42

[491] Leibniz, Meditations on Knowledge, Truth and Ideas, p. 292. In New Essays, p. 186, Leibniz indicated in an non-strictly epistemological tone another problem, being that "*this sort of knowledge cannot influence us - something livelier is needed if we are to be moved*".

[492] Among others, see C. Castoriadis, The Logic of magmas, p. 294, where concerning the definition identity in mathematics it is asserted that "*it is the same as the one already given by Leibniz, when he said, eadem sunt quae substitui possunt salva veri-tate, 'they are identical, those things that can be substituted the ones for the others while saving the truth' - while saving all truths*".

Castoriadis himself Leibniz is never referred to any topic concerning the imaginary element. That being the case, we are attempting the following contradistinction.

Firstly, common grounds can be attributed to the supposition that both concepts do not originate empirically, but are independent of the sensible stimuli that may activate the human mind. From that point, however, arises also a difference: for blind thinking is devoid of distinct empirical perception due to its necessity for brevity or its inadequacy to intuit complex concepts and, thus, ends up dealing with non-empirical issues in a nominalistic manner rather than actually articulating their content; whereas imagination precedes empirical perception and posits the significations as the criteria, according to which sensational input becomes meaningful and, as such, transformed into symbols – be it a psychic monad or a social individual. In that sense, while blind thoughts point to a epistemological dead-end and are regarded as a substitution for intuitive knowledge, imaginary significations provide the breakthrough that may link experience with symbols and words.

Secondly, blind thinking cannot be intuitive, insofar as the empirical object is *absent* from our mind and, consequently, we can reason with none other than the meanings that nominalistically is granted to language. That being said, blind thinking cannot be of course associated with *primary* imagination, because it was never meant to be radically creative, let alone socially activated; nonetheless, hereby implied could be the notion of *secondary* imagination as the merely reproductive or simply combinatory representation of reality, formerly introduced by Parmenides and Aristotle and afterwards recapitulated by Kant as 'produktive Einbildungskraft'[493]. However, it is critical to address that blind thinking must not be confused with secondary imagination, for Leibniz was focusing on thoughts, the objects of which were not absent just from our empirical capacity, but absent from our mind in general. Given that, we may argue that through blind thoughts Leibniz re-opened the discussion on metaphysics: we think 'blindly' when we cannot even imagine an empirical counterpart to our thoughts, apart from the meanings give to words and symbols; and it is only in this manner that we may speak of wholly non-empirical concepts, such as God, virtue or happiness; thus in spite of the fact that blind thinking can neither reason with explicit ideas nor adequately address these concepts, yet remains the only feasible approach that complies with the limited capacity of our human mind. In that sense, we may perhaps associate the Leibnizian blind thoughts with the Kantian 'noumena': both concepts are neither subject to empirical intuition, nor adhere to any intuitive knowledge; and both philosophers we presupposing that their metaphysical object is actually approachable, either through sufficient and distinct analysis of the constitutive ideas or through a non-sensible, perhaps even non-human, mode of intuition.

Nevertheless, in contradistinction with primary imagination by Castoriadis the difference lies with the claim that the object of metaphysical concepts cannot be in any case approached rationally, because its essence is imaginary and, as such, is not externally given, but autogenously posited – created by either the individual psyche or the social-historical instituting. What we can indeed claim is that blind thinking can neither be considered related to secondary imagination, since it still does not represents sensational phenomena, but conceptualizes non-empirical metaphysical concepts. Therefore, the thesis hereby adopts the supposition that blind thinking by Leibniz

[493] For this dimension, see C. Castoriadis, Radical Imagination and the Social Instituting, p. 319-20, 322.

elucidates an intellectual area that stands between primary and secondary imagination and serves as the distinguishing boundary between representational understanding of reality and the imaginary creation of metaphysical concepts.

7.3. Kant: 'Produktive Einbildungskraft' as the predecessor of 'kreative Einbildungkraft'

Placed during the central era of Modernity, it was Immanuel Kant who re-invoked imagination from its historical condemnation and explicitly reintroduced it under the scope of 'produktive Einbildungskraft'. That is the reason why Castoriadis, in spite of his ontological differences, often returned to Kant as the second major milestone subsequent to Aristotle that illustrated a groundbreaking understanding on imaginary element for his contemporary and following thinkers[494].

Primarily, in the first edition of the *Critique of Pure Reason* Kant categorized imagination as one of the "*three original sources (capacities or faculties of the soul), which contain the conditions of the possibility of all experience, and cannot themselves be derived from any other faculty of the mind*", whereas it is on and through the imagination that is grounded "*the **synthesis** of this manifold*"; being such a faculty, imagination is attributed, in addition to its empirical use, "*a transcendental one, which is concerned solely with form, and which is possible* a priori"[495]. That said, imagination participates in "*threefold synthesis, which is necessarily found in all cognition: that, namely, of the **apprehension** of the representations, as modifications of the mind in intuition; of the **reproduction** of them in the imagination; and of their **recognition** in the concept*"[496]. In that sense, already from its introduction, Kant identified imagination as productive, hence the term 'produktive Einbildungskraft'. Furthermore, in terms of this synthesis of reproduction in imagination, "*if we can demonstrate that even our purest* a priori *intuitions provide no cognition except insofar as they contain the sort of combination of the manifold that makes possible a thoroughgoing synthesis of reproduction, then this synthesis of the imagination would be grounded even prior to all experience on* a priori *principles*"; as such, Kant assumes "*a pure transcendental synthesis of this power, which grounds even the possibility of all experience (as that which the reproducibility of the appearances necessarily presupposes)*"[497]. Therefore, since the synthesis of apprehension in the intuition "*constitutes the transcendental ground of the possibility of all cognition in general (not only of empirical cognition, but also of pure a priori cognition)*", it is the reproductive synthesis of the imagination that "*belongs among the transcendental actions of the mind*" and with respect to this is called "*the transcendental faculty of the imagination*" [498]. Thus considered, imagination arises to "*an active faculty of the synthesis of this manifold in us*" and, in

[494] C. Castoriadis, The Discovery of Imagination, p. 215, 218
[495] C.P.R., A95, p. 225, emphasis in the original.
[496] C.P.R., A97, p. 228, emphasis in the original.
[497] C.P.R., A102, p. 230.
[498] C.P.R., A102, p. 230.

order to "*bring the manifold of intuition into an **image***", then "*it must therefore antecedently take up the impressions into its activity, i.e., apprehend them*"[499].

In the second edition of his first *Critique* Kant explicitly defined that "**imagination** *is the faculty for representing an object even **without its presence** in intuition*"[500]. Specifically put, "*since all of our intuition is sensible*", then "*the imagination, on account of the subjective condition under which alone it can give a corresponding intuition to the concepts of understanding, belongs to **sensibility***"; nonetheless, "*insofar as its synthesis is still an exercise of spontaneity […] can thus determine the form of sense* a priori *in accordance with the unity of apperception*", then "*the imagination is to this extent a faculty for determining the sensibility a priori, and its synthesis of intuitions, **in accordance with the categories**, must be the transcendental synthesis of the **imagination**, which is an effect of the understanding on sensibility and its first application […] to objects of the intuition that is possible for us*" [501]. Thus associated with spontaneity, Kant characterized imagination as "***productive***" in contradistinction from the "***reproductive***" imagination, as the synthesis by the latter "*is subject solely to empirical laws, namely those of association, and that therefore contributes nothing to the explanation of the possibility of cognition a priori*"[502]. Furthermore, "*any **determinate** intuition at all […] is possible only through the consciousness of the determination of the manifold through the transcendental action of the imagination*"; that is the reason why the understanding "*does not **find** some sort of combination of the manifold already in inner sense, but **produces** it, by **affecting** inner sense*"[503].

When it comes to imagination as illustrated in the first Kantian *Critique*, Castoriadis appears to display mixed feelings. On the one hand, he acknowledges that through Kant the concept of imagination indeed was revived from the historical abyss to an ontological property with distinct philosophical weight. On the other hand, if its definition was limited as abovementioned, then 'produktive Einbildungskraft' remains only a signification for secondary imagination[504], while it is deeply assumed that "*Kant certainly intends much more than what is entailed by the above definition*"[505]. For, if that was merely case, he notes that "*Parmenides was already saying as much, if not more: 'Consider how the absent (things) are with certainty present to thought (noo)*" and "*Socrates was going much further when he asserted that imagination is the power to represent that which is not*"[506]. To that end, Castoriadis actually reverses the Kantian definition: "*Imagination is*

[499] C.P.R., A121, p. 239.

[500] C.P.R., B151, p. 256, emphasis in the original.

[501] C.P.R., B152, p. 256-7, emphasis in the original, where Kant underlined that imagination, being figurative, *"is distinct from the intellectual synthesis without any imagination merely through the understanding"*.

[502] C.P.R., B152, p. 257, emphasis in the original. Kant also added that, based on that account, reproductive imagination "*belongs not in transcendental philosophy but in psychology*".

[503] C.P.R., B154-5, p. 258, emphasis in the original.

[504] C. Castoriadis, Imagination, Imaginary, Reflection (in Greek), p. 360

[505] C. Castoriadis, Radical Imagination and the Social Instituting, p. 322, where he also added that "*the conception of 'transcendental imagination', the paragraphs on the Schematism, and even the substance of the chapters on space and time go far beyond this definition*".

[506] C. Castoriadis, Radical Imagination and the Social Instituting, p. 322

the power (the capacity, the faculty) to make appear representations […], whether with or without an external incitement", hence "*the power to make be that which 'realiter' is not*" [507].

In that sense, the disagreement with Kant lies with the fact that 'transcendental imagination', albeit an important discovery, is limited to being "*subject, throughout, to the requirements of 'true knowledge'*" and, as such, remains "*eternally 'the same'*"; given that, "*Kant cannot or will not see the creative function of the imagination in the cognitive (scientific or philosophical) domain*" and, consequently, "*the existence of a history of science must remain in the Kantian framework an enigma or, at best, a sheer cumulation of* inductions"[508]. That being the case, Castoriadis concludes, perhaps with some exaggeration, that "*there is nothing more deprived of imagination than the transcendental imagination of Kant*"[509].

Nonetheless, what really seems to fascinate and inspire Castoriadis in Kant is rooted not in the *Critique of Pure Reason*, but in the *Critique of the Power of Judgement*. In his third and last Critique, Kant claimed that "*if we add to a concept a representation of the imagination that belongs to its presentation, but which by itself stimulates so much thinking that it can never be grasped in a determinate concept, hence which aesthetically enlarges the concept itself in an unbounded way, then in this case the imagination is creative*"; and it is precisely this capacity that "*sets the faculty of intellectual ideas (reason) into motion, that is, at the instigation of a representation it gives more to think about than can be grasped and made distinct in it*"[510]. That being said, in terms of complex concepts that may not be subject to spontaneous analysis, hence not directly determinable, then imagination transcends from staying merely productive to becoming creative.

However, it must be underlined that this is the first and only time that Kant actually implied the term of creative imagination, insofar as in the rest of his work, even in the rest of his third *Critique*, imagination is strictly dominated by productive properties. That is the reason why Castoriadis affirmed that "*the third Critique sketches another view, but only 'reflectively' and only as part of a heavy teleological metaphysics*"[511]; for then imagination "*is only mentioned, not used*", whereas "*a creative power is recognized but is not called creative*"[512], meaning not capable of creating new forms and *eide*. Indicative to this point is the fact that Kant, when he referred to creative imagination, he did characterize it in German not as 'kreative', but as 'schöpferisch', the meaning of which majorly points to a divine source, the power of the Creator-God – a concept that Castoriadis expressively rejected as non-creation. After all, despite that subtle recognition, it is asserted that "*when Kants sees in the work of art "produced" by genius the undetermined and indeterminable positing of new determinations, there will still be an "instrumentality" of a higher*

[507] C. Castoriadis, Radical Imagination and the Social Instituting, p. 322
[508] C. Castoriadis, Radical Imagination and the Social Instituting, p. 327
[509] C. Castoriadis, The Discovery of Imagination, p. 245
[510] Kant, *Critique of the Power of Judgement*, 2000, Cambridge University Press, Cambridge, henceforth designated as 'C.P.J.', p. 193.
[511] C. Castoriadis, Radical Imagination and the Social Instituting, p. 326
[512] C. Castoriadis, Radical Imagination and the Social Instituting, p. 328. Concerning Kant's own rhetoric, Castoriadis indicates that the German word '*schaffen*' – not "*schöpfen*" – is used, pointing to "*the power of the genius*" that "*works like nature* (als Natur)".

order, a subordination of the imagination to something else that allows one to gauge its works"[513]; as a result, "*what Kant will discover of essence, beyond what Aristotle does, about the imagination will only make things still more untenable [*intenables*] and radically uncontainable [*in-contenables*]*"[514]. Thus following, the historical outcome will be for creative imagination to "*remain, philosophically, a mere word and the role that will be recognized for it will be limited to domains that seem ontologically gratuitous*", such as the field of art[515].

In any case, of course just the mention of creative imagination by Kant, albeit in passing, "*is surely no accident*"[516] and still remains the first emergence of the concept to the surface of philosophical inquiry. Nevertheless, following the same discussion as for Aristotle, Kant's 'produktive Einbildungskraft' remains a solipsistic property of the subject alone and, as such, strips the social-historical realm from its instituting power[517].

8. ***Forming the human Eigenwelt via the social imaginary instituting arche***

Given that the problematic of ontological arche is answered non-rationally by the social-historical via significations of the social imaginary, dressed in institutions, the arche of Being acquires a social imaginary essence. Based on that posited emerging element, every social-historical forms its own-world – else, its *Eigenwelt* –, as a form of relationship between the human social-historical and its external world.

As a start, the human Eigenwelt is stratified on at least two levels, the strata of the living being and the strata of the social historical[518]; furthermore, when socialized, the individual perceives the world surrounding it in accordance with its social Eigenwelt.

8.1. Human on the strata of the living being

8.1.1. The living being in general

Concerning the living being and its interaction with the world, Castoriadis was deeply influenced by the famous biologist Francisco Varela, who was the first to introduce the concept of

[513] C. Castoriadis, The Discovery of Imagination, p. 214
[514] C. Castoriadis, The Discovery of Imagination, p. 218
[515] C. Castoriadis, The Discovery of Imagination, p. 245
[516] P. Ricoeur and C. Castoriadis, Dialogue on History and the Social Imaginary, in *Ricoeur and Castoriadis in Discussion – On Human Creation, Historical Novelty and the Social Imaginary*, edited by S. Adams, 2017, Rowman&Littlefield International, London, New York, p. 3.
[517] C. Castoriadis, The Discovery of Imagination, p. 245
[518] Of course, between the living being and the social-historical lies the psychic stratum, however it will not occupy the hereto problematic, as its relationship with the social-historical has been already examined on the problematic concerning the psychic monad and the social individual.

'biological autonomy'[519], though to which Castoriadis exercised extensive criticism to some of its aspects[520].

Generally discussing the topic, Castoriadis fundamentally presupposes that the mere existence of a living being "*shows (demonstrates), ex post facto, the existence of a certain kind of relationship between the organization of this living being and that of the world*"[521]. That is because, "*leaning on an organizable – that is to say, ensidizable – being-thus of nonliving nature, the living being self-creates itself [*s' autocrée*] as living being by creating in the same stroke a world, its world, the living world* for it"[522] – else, its Eigenwelt. As a result, "*in nonliving "nature", there is no "information"* for *the living being*", because "*it is the living being that* creates *even the "bits" of what,* for it*, is information*"[523].

That said, it is irrefutable the fact that any living being is indeed leaning on some kind of nonliving nature, bound with the laws that are applying themselves upon it; nonetheless, inasmuch as "*the living being organizes for itself a part or stratum of the physical world*", it bear the capacity to reconstruct "*this part or stratum to form a world of its own*" [524]. In that sense, even if "*it cannot transgress the physical laws of nature or ignore them*", still the living being "*posits new laws of its own*"[525].

However, this creativity of the living being itself to form its own proper world demands some elucidation. The faculty that functions as the level for the self-creation of the living being is – again – its radical imagination, which thus is attributed not uniquely to human beings[526], but to the whole genus of the living beings. For "*radical imagination (as source of the perceptual* quale *and of logical forms) is what makes it possible for any being-for-itself (including humans) to* create for *itself an own [or proper] world (*eine Eigenwelt*) 'within' which it also posits itself*"[527]. Hence, when a living being emerges in existence in accordance to the laws of evolution, it is not content with merely the laws of nonliving nature that are already there; additionally, just by and "*in existing, it creates entire "materially" graspable and assignable strata of "reality"*" [528] – based and embodying the laws that preexisted its emergence. In that sense, "*the living being creates new forms, and, first of all, creates itself [*se crée*] qua form or rather* superform *that integrates, and*

[519] The primary source is the magnus opus of F. Varela under the title *Principles of Biological Autonomy*, 1979, North Holland, Oxford-New York. For a thorough elaboration on the correlating thinking between Castoriadis and Varela, see Life and Creation-Cornelius Castoriadis in dialogue with Francisco Varela, in *Postscript on Insignificance-Dialogues with Cornelius Castoriadis*, 2011 [1998], trans. by G. Rockhill and J. V. Garner, Continuum, New York, p. 74 et.

[520] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 16-7

[521] C. Castoriadis, The Ontological Import of the History of Science, p. 348

[522] C. Castoriadis, The Ontological Import of the History of Science, p. 351

[523] C. Castoriadis, The Ontological Import of the History of Science, p. 351

[524] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 10

[525] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 10

[526] It is worth to underline that non-social human forms, such as the psychic monad, also acquire radical imagination; however, it is exclusively the social individual in its social historical collectivity that are subject and interact with the unique special property of social imaginary.

[527] C. Castoriadis, Radical Imagination and the Social Instituting, p. 326. See also C. Castoriadis, The Ontological Import of the History of Science, p. 348-9, where it is stated that the relationship between the living being and its world is "*not simply "material""*, but "*above all "formal" in character*".

[528] C. Castoriadis, The Ontological Import of the History of Science, p. 351

deploys itself in, an innumerable multiplicity of categorial forms specific to the living being (nutrition, metabolism, homeostasis, reproduction, sexuation, etc.) at the same time that it multiplies itself by differentiating itself into different species"[529].

In order to elaborate the concept of Eigenwelt, Castoriadis reintroduces the example of color, rather iconic in the history of science. Specifically put, "*color and colors, colored-being in general, is a pure creation of the living being (of certain species of living being)*", since "there are no colors *in nonliving nature*"; nevertheless, "*colors cannot be made to disappear by "explaining" them away with the help of correlations between wavelengths and some structure of receptors paired with the central nervous system*", as this would only signify "*a regular correlation*"; thus, it is concluded that "*the fact and the being-thus of the* subjective *sensation of color are absolutely* irreducible *(as are those of odor, of taste—or of pleasure, of pain, etc.)*"[530].

However, Castoriadis stresses the point that, despite the "positive" and "internal" aspect that "*the living being thus creates irreducible strata of being*", the "negative" and "external" aspect is that it still "*creates them within a* closure". That is because these strata apply to the specific living being that created them "*for it* alone*, and each time (for each class, or species, or even singular specimen of the living being) what they are […] and their charge of being – what information theory is condemned to ignore: "pertinence, weight, value, signification" – is other* according to *the living being in question*" [531].

Given this state of closure, living being as genus is incapable on reflecting on its own laws of existence and consciously altering their quality, meaning thusly that its Eigenwelt is created as universal and strict, not being subject to any deliberate change. Besides, "*since this creation takes place, at least for each species,* once and for all", it occurs "*under a fundamental ("in the main":* exclusive*) restriction or constraint: that of functionality or instrumental finality*"[532].

Of course, this line of thoughts points directly to the abovementioned topic of the biocomputer. That being said, we can steadily claim that, despite not being explicitly stated, Castoriadis' understanding of the living being's Eigenwelt can be harmoniously associated with the currently contemporary concept of biocomputer: the biological capacity of a living being's physiology indicates the scope, in accordance to which a living being not only perceives, but also formulates its own cosmos, its Eigenwelt.

8.1.2. The importance of the human biocomputer

Following the abovementioned analysis for the living being and concerning specifically the human merely as a living being, the structure of its Eigenwelt on that respective ontological stratum is correspondingly dominated by the capacity of its biocomputer.

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[529] C. Castoriadis, The Ontological Import of the History of Science, p. 351
[530] C. Castoriadis, The Ontological Import of the History of Science, p. 351-2
[531] C. Castoriadis, The Ontological Import of the History of Science, p. 352
[532] C. Castoriadis, The Ontological Import of the History of Science, p. 352. See also C. Castoriadis, The State of the Subject Today, p. 148.

In other words, when viewed merely as a living being, humans formulate this strata of their Eigenwelt in terms of their specific human biocomputer, which excludes a part of natural reality from their senses and marks the boundary between observable and non-observable natural reality; and whereas the former can under conditions become and form the human Eigenwelt, still the latter are not directly susceptible to experimentation or empirical observation and, as such, are not compatible with the capacity of the human biocomputer – even if they still satisfy the mathematical conditions and are indirectly conceived via theoretical analysis. It is for that cause that Castoriadis himself provides the characteristic example that "*for us humans qua simple living beings polarized light does not exist (whereas it has an immense charge of being for bees and sea turtles) any more than radio waves exist for any terrestrial living being*"[533]. These constituting the fundamental characteristics of the indeed non-observable, yet natural, reality, Being cannot be wholly perceived by human physiology, but only a slice of it; and this slice indicates the physical essence of the Eigenwelt, in which humans exist as merely living beings.

However, on this and only ontological stratum, even human being is burdened with the same state of closure that limits the living being in general. That is to say, if seen as a strict biological structure, the human biocomputer has the capacity to distinguish only sensational stimuli and, hence, the Eigenwelt of the human being retains its rules as given; consequently, since any deliberate change of its rules is negated, the human Eigenwelt may appear as a totally heteronomous environment, thusly not subject to any productive or creative alteration.

Nevertheless, that is not the case for the human being on the social-historical stratum.

8.2. Human on the strata of the social-historical: Beyond the limits of the living being

Especially concerning the human being's Eigenwelt, Castoriadis adopts its parallel social-historical dimension, since he accepts that "*each society, like each living being or species,* establishes, creates its own world*, within which, of course, it includes "itself"*"; correspondingly to the living being, "*it is the proper "organization" (significations and institution) of society that posits and defines, for example, what is for that society "information," what is "noise," and what is nothing at all; or the "weight," "relevance," "value," and "meaning" of the "information"; or the "programs' for elaborating and responding to some given "information"; and so on*"; that being said, it is claimed that "*it is the institution of society that determines what is "real" and what is not, what is "meaningful" and what is meaningless*"[534]. Therefore, "*each society is a system of interpretation of the world", "a construction, a constitution, a creation of a world, of its own world*"[535].

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[533] C. Castoriadis, The Ontological Import of the History of Science, p. 352

[534] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 9. As iconic examples, Castoriadis adds that "*sorcery was real in Salem three centuries ago, but it is not now*", whereas, by quoting Marx, "*the Delphic Apollo was in Greece a force as real as any other*".

[535] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 9. To that point is found the reason, why society "*perceives as a mortal threat any attack upon this system of interpretation*", as this is directly perceived "*as an attack upon its identity*".

That being said, in contrast to the Eigenwelt of the living beings, the human Eigenwelt is built upon the social imaginary significations that have answered the principal ontological questions. That is because, on the one hand, social imaginary, residing only in human being, is regarded a developed, stronger version of the general radical imaginary that even mere living beings share; on the other hand, social imaginary is exercised not by a human individual or psyche as a singularity, but by the social-historical itself as a collectivity, thus extending its scope to the whole of its respective members.

Specifically put, "*for everything that* is *for a living being, the metaobserver can find a physical correlate*"; on the contrary, due to the intervention of social imaginary, fundamentally other to the merely "natural" process of the living being, society "*creates being without physical correlates in a massive and wholesale way: spirits, gods, virtues, sins, "rights of man," and so on – and for which this type of being is always of a higher order than "sheer physical" being*"[536]. In that sense, in the social-historical Eigenwelt, everything that is allowed to exist "*has to* mean *something for it – or has to explicitly be declared to be "without meaning""*"[537]. For that same reason, the notion of "noise" or "disorder" in relation to a society is rejected by Castoriadis. That is because "*what appears as "disorder" within a society is, in reality, something internal to its institution,* meaningful and negatively valued – *and that is a totally different thing*" [538].

Besides, it is not without importance that, as shown above, social imaginary significations, along with their corresponding social institutions, are dominated neither by functionality, nor by finalism. Given these standpoints, in spite of the fact that mere living beings are driven by functionalist motives according to "*a nonnegligible redundancy of the processes for fabricating information*", in the human society "*this fabrication of information as well as its elaboration appear virtually limitless and go far beyond any characterization in terms of "functionality""*[539]. Besides, inasmuch as "*the human psychism is what it is only by means of a radical rupture with the animal "psychism""*, "*there is in the human being a defunctionalization of psychical functioning, and this is expressed in particular by the defunctionalization of the imagination and the defunctionalization (which often becomes, as is known, the counterfunctionalization) of "pleasure," and, in particular, the* domination of representational pleasure over organ pleasure"[540].

In addition, whereas "*finality […] seems to be an inescapable category when one is dealing with the living being as well as with society*", still a distinction is being drawn between the mere living and the human being; for "*the processes in the living being are governed by the "finality" of its conservation, which is itself governed by the "finality" of the conservation of the species – itself governed by the "finality" of the conservation of the biosphere, the biosystem as a whole*"; on the contrary, "*in the case of society, although most of the "finalities" we observe are of course governed by a sort of "principle of conservation," this "conservation" is, ultimately, the*

[536] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 10
[537] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 10. That is the reason why "*for society, there is properly speaking no "noise""*.
[538] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 16
[539] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 9
[540] C. Castoriadis, The Ontological Import of the History of Science, p. 353-4

conservation of "attributes" that are "arbitrary" and specific to each society—its social imaginary significations"[541].

What is more, Castoriadis ascertains that the human Eigenwelt on the social-historical strata is not built once and for all, nor resides in an unbreakable blissful closure, but is constantly self-altering and self-creating itself *ex nihilo* via its social instituting imaginary. That is because "*the fixation of the "characters" of a society does not possess a physical basis (like the genome) that could guarantee (even "probabilistically") their conservation through time, their transmission; there is here no equivalent of any genetic code*"[542]. That is also the reason why the human Eigenwelt is not universal, but is dominated by genuine otherness and plurality; for "*the social-historical does not only create, once and for all, a new ontological type of order characteristic of the genus "society"*", but "*this type is each time "materialized" through different forms, each of which embodies a* creation*, a new* eidos *of society*"[543]. Hence, whereas on the strata of the living each *eidos* of species creates its Eigenwelt, common for all its members, on the strata of the social-historical human being does not share universally a common Eigenwelt, but every human society builds its unique Eigenwelt, probable of varying vastly among its other – sometimes, even enough to start a war.

In all fairness, undoubtedly humanly universal is "*the existence everywhere of institutions and of social imaginary significations*"[544], as it is associated with the natural faculty of human being for radical and social imaginary. Nonetheless, in terms of instituting content, the otherness and plurality of significations and institutions among societies prevail massively; for, since "*there is not and cannot be any "law" or determinate "procedure" whereby a given form of society could "produce" another form or cause it to appear*", "*the attempts to "derive" social forms from "physical conditions," from "antecedents," or from permanent characteristics of "man" are worse than failures: they are meaningless*"[545].

Therefore, human Eigenwelt is not dependent on its specific species, but on every respective society inside that same species. Then, however, the crucial question arises: "*how is the world* tout court*, since there effectively is this indefinite variety of worlds proper to each society?*" Castoriadis dares to answer: "*The world lends itself to (is compatible with) all these S.I.S. [social imaginary significations] and privileges none. That means: The world* tout court *is senseless, devoid of signification […]*"[546]. In other words, the Being itself cannot be grasped purely and directly by human sensations, but it is observed only via and essentially altered by the respective social

[541] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 9-10. Interestingly enough concerning the finality even of living beings, Castoriadis does comment that actually "*the* final *"finality" of the living being is shrouded in a thick mystery*".

[542] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 9

[543] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 13, where as an example is stated that "*there is nothing of substance common to, say, modern capitalist society and a "primitive" society*".

[544] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 13

[545] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 13

[546] C. Castoriadis, Done and To Be Done, p. 363

Eigenwelt and according to its significations provided[547]. Given that, social imaginary significations among different social Eigenwelten are not just different interpretations of the world, but substantially other manifestations of it[548].

Under the light of that final standpoint, arises the epistemological problematic about empirical perception in the social historical: how and by what means the social individual acknowledges reality in relation to the social imaginary significations of its Eigenwelt.

8.3. Perception of the social individual: Addressing the epistemological issues of the social Eigenwelt

The social individuals that reside in a social-historical Eigenwelt are subject to its grasp in terms of empirical perception and understanding. That is because the information drawn from the external environment is majorly 'colored' – at the extremes even biased – by the dominating social significations of the respective Eigenwelt. In that sense, any sensational input is received to the extent that adheres to the capacity of the human biocomputer and, thus, to the human Eigenwelt on the strata of the living being; however, this input is instantly and directly interpreted by the imaginary significations that are incorporating the human Eigenwelt on the strata of the social-historical, which implement their common understanding on the social individuals.

In general, the problematic is posited as follows: when the world is channeled through the human senses, the data extracted are subject to organizing and understanding; this stage of perception demands not merely the sensors, but an additional processor, capable to fulfill even arbitrarily the act of understanding and provide meaning to the world. To that end, there diverge two paths: either the social-historical through its Eigenwelt provide the understanding that springs from its social imaginary significations; or the psyche through its radical imagination provides meaning only to itself.

Fundamentally, let us recall that, from the vast stimuli activating the human senses, it is the concept of Eigenwelt that regulates what is meaningful, what is noise and what is not even instituted as real or existing. And especially for the human being, this act is exercised in a double-layered – at least[549] – dimension, the biological and the social-historical; for the social individual perceives the world not only functionally and materially as a living being with a limited physiology,

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[547] In all fairness, Castoriadis does project social/collective autonomy as the primary evaluating reference for the comparative social strauctures; and that autonomy is depended on the openness of a society to the self-conscious creation of its institutions, whereas heteronomy lies with the closeness of a society and the denial of any conscious alteration of its own way of existing. For the problematic, see C. Castoriadis, The Imaginary: Creation in the Social--Historical Domain, p. 17-8, and the Logic of Magmas and the Question of Autonomy, p. 310-12.That topic, however, exists the aim of the hereby study.

[548] C. Castoriadis, Done and To Be Done, p. 363-4, where Castoriadis states that "*all 'hermeneutical' discussion, every attempt to see in the creation of S.I.S. [social imaginary significations] 'interpretations' of the world, has no ground to stand on".*

[549] The reservation is grounded on the strong assumption that, apart from the biological and the social-historical strata, human Eigenwelt is also constituted by the first natural and the strictly psychical strata.

but also meaningfully as a social subject, attributed the capacity to understand socially instituted significations.

It is for this reason that Castoriadis reestablishes his theory that "*the type of relation with the "presocial" world (what I call the first natural stratum) that society creates and institutes [...] is an "anaclitic" relation, a "leaning on" (Anlehnung, étayage)*"; as a result, "*the "logical/physical" operations through which every society relates itself to the first natural stratum, organizes it, and makes use of it are always under the sway of its social imaginary significations*"[550]. What is more, despite the fact that the first natural stratum resists formulation by the social instituting force, still this resistance, though directly or indirectly perceived, does not lead to a non-social understanding of the natural world; for the social individual, by construct and function, perceives and understands reality mostly according to the social meaning that its Eigenwelt transfuses to reality. In that sense, even if "*the constraints that the physical world imposes on the organization of the living being supply an essential part of our understanding of this organization*", nonetheless "*that which the natural world as such insuperably dictates that society – and thereby, all societies – do or forbids society from doing is utterly trivial and teaches us nothing*"[551].

Of course, as shown above, let us also recall that the radical imagination of the psyche does not cease when socialized, but resides partially active inside the social individual. Given that, despite being vastly susceptible to its socializing Eigenwelt, the psyche is projected when called upon, as a reminiscent remnant of the ruptured monadic closure. As such, when perceiving the world, its meaningful understanding is provided not exclusively by social significations, but additionally by psychical representations; and it is still possible that the latter may radically create meaning that surpass the scope of the former and distance the perception of the individual from the collective understanding of its social Eigenwelt. In that sense, the dyadic ontology that resides inside every social individual is – or can be – embodied in the perception of the world; however, the sustenance of the psychic element, though partially decisive, does not wholly overturn the fundamental supposition that the perception of the social individual is primarily and distinctively collective as social-historical.

Concerning that dominating formulating force of the Eigenwelt on sensational perception, rather intriguing are examples associated with the process of learning – meaning, the process of instating and reinstating social meanings and behaviors.

Firstly, according to an example drawn by Castoriadis himself, "*one need only have seen Africans and Europeans/Americans dancing side by side to understand that one's relation to one's body is socialhistorically determined*"[552]. Towards some elaboration, concerning dancing it is practically obvious that the African and the Western Eigenwelten are distinct to such extent, that the simple physical behavior of their social individuals is formulated in an irrefutably and massively different manner. That being said, Castoriadis argues that "*the essential feature of human 'learning' does not concern a proper world given once and for all, but it is related to another social-historical*

[550] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 10
[551] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 10
[552] C. Castoriadis, Done and To Be Done, p. 382

world, to other societies", while is manifesting "*not only in the case of one's tongue but also for all of one's behavior*"[553].

However, the most iconic example springs not from the work of Castoriadis, but from sociological experiments to non-literate societies – that is, from comparison of different human Eigenwelten. As narrated by M. Talbot, "*it should come as little surprise, then, that non-literate societies literally cannot see certain types of images such as photographs and films*"[554]. Specifically put, in an experiment implemented by J. Wilson[555], when the members of a primitive African village were shown a film intended to teach them methods of sanitation, "*not one of the thirty-old villagers watching the film was able to see it*"; what is more mind-blowing is the fact that, "*when questioned about what they had seen, the villagers were unable to answer except for the curious fact that they had all seen a chicken (which may have possessed some religious significance for them) that had made a momentary appearance in the film*", concluding thusly that "*the fowl was the 'one bit of reality for them'*"[556].

Talbot explained these findings under the supposition that we have "*such a tremendous urge for conformity of our perceptions*", because "*we have taught ourselves to conform*"[557]. That statement points to the fact that, following the teachings of J. R. Smythies[558], since "*the world of the child is quasi-hallucinatory*", then "*as they grow up children learn to ignore certain aspects of their reality that are considered hallucinatory by the adults around them*"[559]. Furthermore, while drawing inspiration also from J. Piaget[560], Talbot consents to the theory that "*notions of perception being innate or genetic are as yet unproved*" in the sense that "*the ability to perceive may be innate, but it is clear that we learn what to perceive*"[561]. Under the light of these statements, it is concluded firstly that, inasmuch as "*the brain perceives what it wants to perceive*", "*we are not born into the world*", but "*we are born into something that we make into the world*"[562]; secondly, that "*our world is 'word-built'*" and "*our reality is a semantic creation largely constructed by our cultural beliefs*", meaning that "*what we believe to be true becomes true*" and "*what we call reality is learned*"[563].

In the attempt to elucidate these findings under the scope of the hereby project, we can additionally to the abovementioned claim that the nearly nullified capacity of African primitives of that time to even perceive the empirical output of modern European invention lies with the fact that the latter does not adhere to the Eigenwelt of the former. That is because in their social-historical world photographs and films do not even exist; as such, given that they are not instituted in any

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[553] C. Castoriadis, Done and To Be Done, p. 382
[554] M. Talbot, *Mysticism and the New Physics*, p. 93
[555] For further details on the facts concerning that experiment, see John Wilson, Film Literacy in Africa, *Canadian Communications*, 1961, vol. 1, no. 4
[556] M. Talbot, *Mysticism and the New Physics*, p. 93. That same experiment is also referred in M. Danezis and S. Theodossiou, *The Cosmology of Cognition* (in Greek), p. 97-8.
[557] M. Talbot, *Mysticism and the New Physics*, p. 93
[558] For further elaboration, see J. R. Smythies, *Analysis of Perception*, 1956, Humanities: New York.
[559] M. Talbot, *Mysticism and the New Physics*, p. 93
[560] See J. Piaget, *The Child and Reality*, 1972, Grossman: New York.
[561] M. Talbot, *Mysticism and the New Physics*, p. 93
[562] M. Talbot, *Mysticism and the New Physics*, p. 94
[563] M. Talbot, *Mysticism and the New Physics*, p. 99

way, they do not produce any meaning, positive or negative – actually not even noise. Therefore, when excluded by the respective human Eigenwelt, phenomena and things are residing beyond the perceiving capacity of its social individuals to the extent that they cannot even appear empirically as sensational input. *That* is the dominating force of the social-historical on the individual human perception.

Consequently, given this 'coloring' of empirical perception by the social Eigenwelt, Castoriadis acknowledges that "*there is not, and could never be, either biological or social ''solipsism''*" [564], meaning that there can never be an egological perception, nor individual perception. That is because "*this emerging of perception and of things in the history of the subject can never be thought of solely from the* psychogenetic *perspective – or, more generally, from the* idiogenetic *perspective, as production, creation, maturation, discovery of or by a proper, singular (*idion*) subject*", but "*only from a* sociogenetic *or* koinogenetic *(*koinos*, common, shared) perspective*"; for "*not only is it in and through the institution of society that individuals, things and world exist […] but each society is this particular institution , bringing into being this particular magma of social imaginary significations and not some other one, in this particular way and not in any other, by means of a given socialization of the psyche and not some other*" [565]. Under the same scope, S. Adams contributes that, since "*there is no transcultural individual*", "*perception is not just ''social vision''*", but "*possible only within language […] and hence is caught up in significations of meaning*", which "*animate and inhabit ''things'' and give them their meaningful content*" [566]. In that sense, Castoriadis concludes that "*we are unable to think of an individual perception essentially independent of the social institution of the individual, of the thing, of the world*"[567].

Given that estimation, while Castoriadis rejects the Kantian approach as tautological[568], his fierce criticism is turned against phenomenology – mainly by Husserl, Merleau-Ponty and Heidegger – and its so-called fallacies, the most fundamental of those being the delusion that "*the 'first-person' or 'intentional' stance presents to, or for, me 'the things as they are'*"[569]. That is because this supposition comes with "*fatal solipsistic consequences*", since "*from the strict phenomenological point of view I have no access to the experience of 'other persons'; they and their 'experiences' exist just as phenomena for me*"[570]. And even if the scope is transferred "*from the*

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[564] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 10. This ascertainment extends beyond the social individual, since even "*the living being organizes for itself a part or stratum of the physical world; it reconstructs this part or stratum to form a world of its own*"; and although "*it cannot transgress the physical laws of nature or ignore them*", still "*it posits new laws of its own*".

[565] C. Castoriadis, *The Imaginary Institution of Society*, p. 333-4

[566] S. Adams, p. 95

[567] C. Castoriadis, *The Imaginary Institution of Society*, p. 335

[568] C. Castoriadis, The Ontological Import of the History of Science, p. 346. To that point, S. Adams adds as follows: *''Pure'' space and time can only be so for a second-order reflexive separation. The egological aspect of Kant's critical philosophy is moreover subverted by the irreducibly social-historical nature of language, whose assumed absence makes the transcendental subject incoherent in communicating to itself*." (p. 96).

[569] C. Castoriadis, Radical Imagination and the Social Instituting, p. 324

[570] C. Castoriadis, Radical Imagination and the Social Instituting, p. 324. Rather descriptively, Castoriadis wonders: "*How do I know that something exists for the next person or, indeed, that a next person exists at all if I am confined to my 'first-person stance'?*". And he continues accordingly: "*The 'first-person stance' is bluntly contradictory, even if we*

egological, strictly phenomenological point of view […] to the 'life-world'", then still "*one has just exchanged the egocentric for an ethno- or sociocentric point of view: solipsism on a larger scale*"[571]. Of course, among the phenomenologists, Castoriadis distinguished the case of Merleau-Ponty as exceptional[572], because the latter's major work, *The Visible and the Invisible*, incorporates the problematic of imagination and the imaginary and "*sometimes goes almost so far as to dissolve the distinction between the imaginary and the real*"; nonetheless, Castoriadis argues that even Merleau-Ponty was drawn back by "*the persistence of the* schema *of perception in the broadest sense, from which he will never completely succeed in freeing himself, perception having become now experience or ontological* reception"[573].

Of course, in spite of the critique against Kant, Castoriadis asserts that the perception of the social-individual is bound to an a priori organization that precisely derives from the concept of Eigenwelt. Concretely put, "*if there is a proper world, its organization can only be* a priori"[574]. What is more, whereas surpassing the Kantian distinction between categories, 'transcendental' schemata, and 'empirical' representations, Castoriadis argues that "*genericity and categoriality are intrinsic and immanent to the representation*", because "*any representation […] contains* qualia *and an organization of these* qualia*; this organization, in turn, consists in generic figures and traits and in categorial schemata*", which "*have to be* named *and* reflected upon"[575]. That being said, while the social Eigenwelt does 'color' the empirical perception of the social-individual, this 'coloring' is implemented in accordance to a priori categories; however, these categories are not divine or given a priori, but are instituted as creations of the social imaginary and assume the systemic position of social imaginary significations. That is the reason why S. Adams argues that "*our access to the world does not occur via unmediated reason nor the purely (natural) senses",* because *"we think/experience/construct/do through categories*"; nonetheless, even if "*they function*

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leave aside the 'other person'. It tells me, for example, that to move an object, or to move myself, I need force. But if I am in a car and the driver brakes abruptly, I am projected through the windscreen without deploying any force. The 'privilege' or 'authenticity' of the 'first-person stance' looks philosophically very funny if this stance leads, as lead it must, to contradictions or incoherencies in the very 'experience' it keeps celebrating. Husserl's 'The Earth, as Ur-arkhe, does not move' forces me, for instance, to dismiss as absurd or illusory phenomena of equally compelling immediacy (e.g., Foucault's pendulum, or the yearly parallax of the fixed stars)."

[571] C. Castoriadis, Radical Imagination and the Social Instituting, p. 325, where is stated that such was the call by the last Husserl and the early Heidegger.

[572] Characteristic to that point are the two studies that Castoriadis produced as a homage of contributions by Maurice Merleau-Ponty, these being Le Dicible et l' Indicible (in French), in *Les Carrefours du Labyrinth*, pp. 161-190, and Merleau-Ponty and the Weight of the Ontological Tradition in *World in Fragments*, pp. 273-310. Intriguing is the comment by S. Adams, according to whom "*Merleau-Ponty must be considered a central intellectual source for the development of Castoriadis's thought*" (S. Adams, p. 2), because "*each of Castoriadis's encounters with Merleau-Ponty occurred on the eve of – and in close connection with – major ontological breakthroughs in his own thought*" (S. Adams, p. 4).

[573] C. Castoriadis, The Discovery of Imagination, p. 216

[574] C. Castoriadis, Done and To Be Done, p. 365. That idea is supported with the following example: "*The idea that electromagnetic waves are coloured in themselves, or that one might be able to discover by induction the categories of the one and the many on the basis of 'observation' (which therefore could not know at the outset whether that which was observed was ' one' or 'many' or both at once) - these ideas are absurd*". That same concept applies also to the proper world of the singular psyche (p. 365).

[575] C. Castoriadis, Radical Imagination and the Social Instituting, p. 329

as quasi-Kantian", "*these categories are not ''natural,'' nor are they individually constituted; they are created and instituted by, through and as, the social-historical*"[576].

Under the light of these conclusions, it is deduced that perception springs primarily from the human senses, but it is afterwards 'colored' by the social imaginary significations that reside in the respective Eigenwelt. Nevertheless, this does not exclude entirely the psyche of the social individual from projecting its own representations, while subsumed to the dominating social significations.

8.4. Concluding remarks: Humanly sensible reality in the limits of the Eigenwelt

In conclusion, following this chapter, it is herein acknowledged that the human Eigenwelt is stratified on two levels: firstly, on the level of the living being, where human being via its radical imaginary creates functionally its own laws in accordance to its external environment and its biocomputer as the data processor given by its physiology; secondly, on the level of the social-historical, where every human society self-creates via its social instituting imaginary its own way of meaningful being beyond functional motives, which remains historically changeable and respectively *other* for each and every social structure. Based on this stratification, the sensible data of human perception are 'colored' by its respective Eigenwelt and projected accordingly as 'reality'.

Given the abovementioned assertions, the thesis hereto adopts the epistemological claim that the respective human Eigenwelt determines as reality only the part that colors as meaningful. In other words, for the social individuals residing in an Eigenwelt, perceivable and thusly understandable is only the part of reality compatible with the respective social imaginary significations, instituted in the respective social structure. In that sense, even natural – strictly material – reality is projected in a social-historical reflection, inasmuch as its sensibility is determined by the capacity that a social-historical Eigenwelt inscribes on the sensors of its individuals. That signification of meaningfulness is what also inscribes the concept of knowledge – even scientific.

What is more, this epistemological capacity differs in comparison with the innate capacity allowed by the human biocomputer. Let us recall that the human biocomputer determines the scope of observable reality for the human physiology, beyond which reality remains non-observable. However, the human Eigenwelt distinguishes only a part of the humanly observable natural reality and transcends it into the 'truly meaningful' reality, discarding the rest of the observables as meaningless and, therefore, as non-sensible. Given that, the social-historical acknowledges as only existing a narrower ontological area in comparison with the full innate capacity of the human physiology; nonetheless, this area is proclaimed not as merely observable, but as socially meaningful, as essentially compatible with the values and the norms instituted by a human society.

It is intriguing to add that this statement confirms the abovementioned argument that social imaginary as vis formandi can metaphysically, though partially, formulate reality; for it is via

[576] S. Adams, p. 72

creation ex nihilo that the social-historical may actually demarcate the area of observable reality that becomes humanly perceivable. That being said, we can now understand deeper, how human imagination is capable of partially and under constraints formulate natural and biological behavior; that is because the instituting imaginary of an Eigenwelt may determine the appearance of meaningful reality to the extent that indeed remains feasibly determinable.

Thus being the case for natural reality, the same impact is accordingly applied to scientific reality, based and through which scientific knowledge, along with its praxis and its axioms, are developed. But beforehand, to our attention arises the general status of imagination in scientific praxis.

9. ***Imagination in scientific praxis: Taming the chaos via scientific axioms***

The turn from philosophy of social imaginary to philosophy of science appears rather natural and unavoidable for Castoriadis. Characteristically he asserts that "*the path of philosophy (ontology, metaphysics) necessarily opens up when one reflects upon mathematics, physics, or biology [...] when one reflects upon the fact, unintelligible from the standpoint of criticism, that there is, in the weightiest sense of the term, a history of these sciences*"; after all, "*to do philosophy is to take responsibility for the totality of the thinkable, since philosophy is required to reflect upon all our activities*"[577].

Drawing from the physis/nomos dipole, Castoriadis defined nature, albeit itself formless and chaotic, as "*the push, the endogenous and spontaneous growth of things that nevertheless is also generative of an order*"[578]. Given that definition, natural reality is attributed not only with its formless and chaotic character, but also with a capacity for order, thus being somewhat subject to organization.

Therefore, it becomes essential not only to solidify the essence of natural reality as the ensidizable object of scientific praxis, but also to justify the relation between radical imaginary and scientific praxis and, hence, to found the dyadic ontology of scientific axioms, as suggested by Poincare along with Castoriadis.

9.1. Natural reality in scientific praxis: Approaching the first natural stratum

9.1.1. Ensidizable natural order as the scientific object

Along with the fact that the Being is primarily the boundless Chaos, Castoriadis completes his general ontological theory by simultaneously accepting that the Being is also ensidizable, meaning organizable via the identitary-ensemblist logic. Given that, another fundamental standpoint

[577] C. Castoriadis, Done and To Be Done, p. 362-3.
[578] C. Castoriadis, Physis and Autonomy, p. 331

is claimed, according to which in general not only "*a certain knowledge of being [*l' étant*] exists*", but also knowledge "*of what is called natural being [*l' étant dit naturel*]*"[579].

Castoriadis associates this topic with the strata of the living being, since "*the organization of the living being presupposes and entails the* organizability *of (at least) certain parts of the world*"; and, whereas this organizability is manifested both in its inside and outside world, it is supposed that "*the living being cannot function (that is to say, it simply cannot live, cannot be what it is) without "classifying," without "categorizing," therefore also without "distinguishing", "separating" and even "enumerating", but also without bringing into relation the elements it distinguishes – and, finally, it must also be able to form and "inform" a part of the world*"[580]. After all, it is only through this ensiding capacity that the living being formulates the laws for its own proper world, its Eigenwelt. However, "*this would be impossible if there were no form*able *and "inform*able*" parts of the world—in other words, separable, enumerable, classifiable, categorizable—and if their "elements" and their "classes" could not, in certain respects, be brought into relation*"[581].

As a result, it is deduced that, for the organization by the living being to be possible, is essentially presupposed that "*there exists a stratum of natural being [*l' étant naturel*] that is organiz*able*, sufficiently so for the living being to exist therein; and the essential part of the organization that the living being imposes (or constructs) upon this stratum is ensemblistic-identitary*"[582]. It is precisely this stratum that Castoriadis names **first natural stratum**, therein including the living along with the non-living being. In addition, the living being "*nourishes itself upon it, one can say, ontologically and logically, inasmuch as this stratum allows the living being, each time, to construct its own living world, inasmuch as it finds there not "information" […]but rather the formable*"[583]. Therefore, inasmuch as first natural stratum is organizable and formable, it is concluded that "*there is some* immanent universal*, or something immanently ensemblistic-identitary – and this, independent of the existence of the living being itself*"[584] and "*not limited to the "needs of the living being*"[585].

Under the light of these syllogisms, the discovery of this seemingly universal, yet surely ensidizable, natural order becomes the object which scientific praxis strives to elucidate. It is thusly revealed that, despite elevating chaos as the primary essence of the world, still scientific knowledge is possible to be attained. Nonetheless, this remains possible at least to some extent; for the chaotic element retains its ontological significance and complicates the problematic.

[579] C. Castoriadis, The Ontological Import of the History of Science, p. 342
[580] C. Castoriadis, The Ontological Import of the History of Science, p. 349
[581] C. Castoriadis, The Ontological Import of the History of Science, p. 349
[582] C. Castoriadis, The Ontological Import of the History of Science, p. 350
[583] C. Castoriadis, The Ontological Import of the History of Science, p. 350
[584] C. Castoriadis, The Ontological Import of the History of Science, p. 350
[585] C. Castoriadis, The Ontological Import of the History of Science, p. 349

9.1.2. Chaos in scientific praxis: Heterogeneity of ontological strata

When striving for scientific knowledge, Chaos returns to the fold, intervening with that endeavor and disrupting irregularly the ensidization of natural reality.

On the one hand, indeed "*the mere existence of the living being implies the effective existence [*effectivité*] of an immense ensidizable stratum of what is*"[586]. On the other hand, Castoriadis explicitly indicates that "*that admission certainly does not signify that this "stability," this "organizability," this "separability' – "formability" in general – exhausts the world*"; on the contrary, "*these characteristics concern only one (or some) of its parts*"[587], since "*the physical world has to be "locally" ensidic*"[588], but never transregionally. In that sense, the ensidizable natural order of this world "*does not form an ensidic "system"*", for the Being "*is stratified, and this stratification is irregular, heterogeneous*"[589]. Under this heterogeneity is signified that, despite that "*each of these strata includes an ensidic dimension – or lends itself, indefinitely, to an ensidic elaboration, to an ensidization*", it is still the case that "*their relationship does not so lend itself*"[590]. In other words, "*we're constantly discovering that the organization and ultimate order of this cosmos escapes us […] precisely because the various strata of what presents itself as being are irreducible to other supposedly more fundamental or more elementary strata*"[591]. Consequently, the world is not ensidizable in the same manner, but "*it is so* in other ways*, and thus* according to *which* stratum *of this world one considers (or one "discovers' – one "constructs" – one "creates")*"[592]. After all, "*the history of science shows that the world is not ensidizable in its totality, but that it is so almost indefinitely in fragments and that, in the decisive cases, the linkup [*raccord*] between these fragments is simply de facto*"[593].

In conclusion, despite the acknowledgment of some kind of order in the world, the chaotic element of Being sustains its impact, thus rendering the ontological problematic inexhaustible by the identitary-ensemblist logic. And this time, given that is still possible and actual "*a surging forth, within Being/being [*être/étant*], of new and irreducible forms*", Chaos is introduced again as "*an essential* ontological heterogeneity*: either an irregular stratification of what is, or else a radical incompleteness of every determination* between *strata of Being/being*"[594]. That being said, on the one hand, the strata of Being may indeed be susceptible to partial organization; on the other hand,

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[586] C. Castoriadis, The Ontological Import of the History of Science, p. 353
[587] C. Castoriadis, The Ontological Import of the History of Science, p. 350
[588] C. Castoriadis, The Ontological Import of the History of Science, p. 372
[589] C. Castoriadis, The Ontological Import of the History of Science, p. 372
[590] C. Castoriadis, The Ontological Import of the History of Science, p. 366
[591] C. Castoriadis, False and True Chaos, p. 389. At the same point, concerning the association among heterogeneous strata, Castoriadis admits that "*there's no possible way of reducing the social historical to the psychical, nor both of them to something else, and that there is no possible way of reducing the biological to the physicochemical, for the very simple reason that what emerges for example already with the biological is a meaning that doesn't exist in the physical world – that is to say, a meaning for-itself, a meaning whose aim, for example, is self-preservation, self-reproduction*".
[592] C. Castoriadis, The Ontological Import of the History of Science, p. 369
[593] C. Castoriadis, The Ontological Import of the History of Science, p. 372
[594] C. Castoriadis, The Ontological Import of the History of Science, p. 353

since "*heterogeneous strata of physical Being/being*"[595] are unavoidable, the relationships among strata themselves reside beyond the capacity of any ensidizable order, non-reducible to any common logic as "*not itself ensidizable*", nor "*constructible*"[596]. Thus, any scientific knowledge remains fragmented, since its assets apply only to a specific stratum, whereas the rest are organized differently. And, while "*this is already true of the strictly "physical" world*", distinctive are "*the gaps of another nature that separate the physical from the biological and both of them from the psychical and from the social-historical*" [597].

9.2. The dyadic ontology of scientific axioms: Harmonizing the imaginary with the ensidic element

In the attempt to decipher the ensidizable order in spite of the chaotic element, scientific praxis introduces scientific axioms as possible answers to inevitably unanswerable questions. Given that, Chaos fused in the philosophy of science reveals again the problematic of the genuine and principal ontological questions in terms of scientific knowledge. And, because of their essence, these questions are never answered logically or empirically, but primarily imaginarily. That is the reason why the fundamental scientific questions are not actually scientific but are transcended to "*philosophic interrogation from the heart of scientific activity*"[598].

For example, principal entities, such as matter, energy, space and time, are presupposed in scientific praxis, but are never defined by it; for they constitute philosophic categories[599], not scientifically verifiable ensembles, that can only be embodied by scientific axioms.

In terms of its role, a scientific axiom bears the burden to bridge the distance between the parts of strata that are indeed organizable with their intrinsic heterogeneity that renders them irregular and irreducible among themselves. As such, the properties of scientific axioms obtain a dyadic ontology, being simultaneously imaginary, but still non-arbitrary; for, as abovementioned, Chaos allows the activation of the creative imaginary, while order provides the intrinsic constraints that resist against creation. And it is exclusively due to this combination that science and its entities can surge forth and develop their logical structure.

This project was thoroughly articulated in philosophy of science by H. Poincare and received acclaim for Castoriadis through the concept of the radically creative imagination under the main argument, that the axiomatic-imaginary-metaphysical part of a scientific statement is connected non-rationally, yet non-arbitrarily, with its logical-empirical-ensidic counterpart.

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[595] C. Castoriadis, The Ontological Import of the History of Science, p. 372
[596] C. Castoriadis, The Ontological Import of the History of Science, p. 369
[597] C. Castoriadis, The Ontological Import of the History of Science, p. 372
[598] C. Castoriadis, Preface (in French), p. 11
[599] Especially concerning matter as a philosophic category, distinct from mass as a physical concept, see E. Mpitsakis, *The evolution of theories in Physics* (in Greek), 2008, Daedalos-Zacharopoulos Publications, Athens p. 155, 158, 224.

9.2.1. Poincare: 'Conventions' as a groundbreaking approach

In the attempt to elucidate the nature of scientific axioms, Poincare through his conventionalism, parallel to his relationism already abovementioned, contributed a notably groundbreaking approach. Generally put, it is suggested that every scientific principle, as well as every theoretical claim, expresses simultaneously two entangled dimensions, an empirical and a conventional – non-empirical. In Poincare's own words, in terms of mechanics, it is stated that its principles are "*presented to us under two different aspects*"; "*on the one hand, there are truths founded on experiment, and verified approximately as far as almost isolated systems are concerned*"*;* "*on the other hand, there are postulates applicable to the whole of the universe and regarded as rigorously true*"; therefore "*if these postulates possess a generality and a certainty which falsify the experimental truths from which they were deduced, it is because they reduce in final analysis to a simple convention that we have a right to make, because we are certain beforehand that no experiment can contradict it*"[600].

Following this general viewpoint, for the needs of the hereby thesis we shall focus on the nature of conventions and their connection with their empirical counterpart. To that end, we will be breaking up the analysis into the following parts.

9.2.1.1. Non-empirically proven and freely chosen presuppositions

On the one hand, conventions by Poincare "*constitute the objects of science and constrain from above proper empirical scientific inquiry*" and, as such, "*are neither verifiable, nor falsifiable*"[601]. That being said, conventions embody the dimension of the scientific statements which itself is not subject to empirical justification but is still presupposed as the basis for making any scientific development possible and, as such, is adopted as truth-like. Generally concerning mathematics, Poincare claimed that "*when I have laid down the definitions, and the postulates which are conventions,* a theorem henceforth can only be true or false"; however, whether that theorem is true or false, "*it is no longer to the witness of my senses that I shall have recourse, but to reasoning*"[602]. As such, conventions themselves are not the object of experimental proof, which focuses only on the theorems that logically originate from the presupposed conventions[603]. In addition, conventions are methodically preceding empirical justification since they incorporate the presuppositions for every experiment and direct its findings to a specific goal[604].

[600] H. Poincaré, Science and Hypothesis, 1905, The Walter Scott Publishing CO., New York, p. 152
[601] Psillos, Conventions and Relations, p. 117
[602] H. Poincare, The Value of Science, p. 328
[603] For the examples drawn by Poincare from geometry and mechanics, see Psillos, Conventions and Relations, p. 101-116.
[604] For that topic, see Poincare, The Value of Science, p. 317-19.

In that sense, a convention in a scientific theory is not a mere hypothesis, awaiting to be regarded as true or false depending on experimental confirmation or disconfirmation[605]; on the contrary, it is an axiomatic presupposition, based on which scientific hypotheses are articulated and empirical experimentations are insightfully carried out.

These assertions considered, conventions rise as a distinct epistemological category that breaches and furthers the traditional Kantian system. That is because, according to Psillos[606], it is argued as follows: "*Given the Kantian trichotomy between analytic judgements, synthetic a priori judgements and experimental facts (empirical propositions), the 'hypotheses' that lie at the basis of geometry fit in none of them. They are not analytic truths like the principle 'two quantities which are equal to a third one, they are equal to each other'. They are not synthetic a priori judgements since we can conceive their negation; that is, they are not necessarily true. Finally, they are not experimental facts, because if they were considered such, geometry would no longer be an exact science; it would be subject to constant empirical revision.*"

In addition, what is indeed groundbreaking lies with the argument that, since conventions are presupposed without being empirically testable, then they are freely chosen – perhaps, implicitly created[607] – by the human mind among competing, but correspondingly equivalent, frameworks[608]. Poincare explicitly argues that "*from them [conventions], the sciences derive their rigour; such conventions are the result of the unrestricted activity of the mind, which in this domain recognises no obstacle*"; that is because the human mind "*lays down its own laws*" which indeed "*are imposed on our science*" – even though "*are not imposed on Nature*" [609]. After all, whereas some freedom, though limited, is acknowledged regarding the enunciation of crude facts as scientific phenomena[610], it becomes principally clear that "*if from facts we pass to laws, it is clear that the part of the free activity of the scientist will become much greater*"[611].

9.2.1.2. Non-arbitrary as convenient to the empirical reality

However, on the other hand, questions arise concerning the constraints of this free activity of the scientist, which causes the danger of rendering scientific sequences arbitrary. To that end,

[605] Concerning the role of hypotheses and their distinction, see H. Poincaré, Science and Hypothesis, pp. 167-177. For a summary, see Psillos, Conventions and Relations, p. 114.
[606] Psillos, Conventions and Relations, p. 101
[607] This implication is given by Psillos in Conventions and Relations, p. 133
[608] Psillos, Conventions and Relations, p. 115
[609] H. Poincaré, Science and Hypothesis, p. xvii-xviii
[610] Concerning the distinction between crude and scientific facts, see Poincare, The Value of Science, pp. 325-333, where is stated that the free activity of the scientist on the observed facts is limited only to "*choosing the facts worth observing*" (p. 332); that is because, the scientist "*does not create it [the scientific fact] from nothing, since he makes it with the fact in the rough*" and, consequently "*he does not make it freely and as he* chooses", his freedom thusly remaining "*always limited by the properties of the raw material on which he works*" (p. 331).
[611] H. Poincare, The Value of Science, p. 333

since empirical justification is out of the question, Poincare introduces the concept of convenience as the criterion for favoring or condemning a respective convention, thus becoming non-arbitrary[612].

Specifically put, when wondering on that suspicion of arbitrariness, Poincare argues that "*experience leaves us our freedom of choice, but it guides us by helping us to discern the most convenient path to follow*"[613]. In other words, the conventional dimension of a theory "*is not absolutely arbitrary*", nor "*the child of our caprice*"; on the contrary, "*we admit it because certain experiments have shown us that it will be convenient, and thus is explained how experiment has built up the principles of mechanics, and why, moreover, it cannot reverse them*"[614]. Therefore, non-arbitrariness of conventions is founded on two levels: firstly, their empirical origin and, secondly, their convenience for serving as ontological presuppositions of a scientific structure.

In the attempt to elucidate these parameters, we can claim that conventions, albeit non-subject to empirical understanding, still retain 'some' relation with the empirical dimension of the theory, for the latter "suggests" or "serves the basis for" or "gives birth to" the former[615]. Moreover, since guided by experience, conventions bridge the world of mathematics with the world of experience and, as such, are chosen freely but still not arbitrarily[616]. Given that deep, yet not dictating, connection with scientific reality, conventions are "*deduced from experimental laws*", which have been "*erected into principles to which our mind attributes an absolute value*" [617]. After all, this relation with experience explains the reason why conventions, though primarily detached from direct experience, are still applicable to reality[618].

Of course, being associated with and guided by experience, the conventional part must be compatible with the same laws that apply to the empirical part of the same scientific theory. This compatibility is provided through the need for convenience, meaning that, even if empirically non-verifiable, a convention should still be consistent with the empirical data. According to Poincare, when a convention serves as a hypothetical, non-empirically grounded presupposition, "*what is essential for us is, that everything happens as if it existed, and that this hypothesis is found to be suitable for the explanation of phenomena*"; what is more, for Poincare even believing in the existence of material objects "*is only a convenient hypothesis*"[619]. That being said, a convention cannot be proved factually true, since it is neither an empirical generalization, nor a priori justifiable; still, it can be conveniently true as a constitutive presupposition for a theoretical framework[620]. For example, "*the fundamental propositions of geometry, for instance, Euclid's postulate, are only conventions, and it is quite as unreasonable to ask if they are true or false as to*

[612] H. Poincaré, Science and Hypothesis, p. xx
[613] H. Poincaré, Science and Hypothesis, p. xviii
[614] H. Poincaré, Science and Hypothesis, p. 152
[615] Psillos, Conventions and Relations, p. 109. This rhetoric is rather common in H. Poincaré, Science and Hypothesis.
[616] Psillos, Conventions and Relations, p. 128
[617] H. Poincaré, Science and Hypothesis, p. 155
[618] Psillos, Conventions and Relations, p. 109
[619] H. Poincaré, Science and Hypothesis, p. 235
[620] Psillos, Conventions and Relations, p. 110

ask if the metric system is true or false"; nonetheless, "*these conventions are convenient, and there are certain experiments which prove it to us*"[621].

In that sense, in any scientific theory the conventional dimension is thoroughly bridged with the empirical dimension; however, their link is not forged via strict formal or identitary logic, but fulfills the non-strict need for convenience, meaning that the conventional must remain consistent with the empirical.

As a result, convenience emerges as the criterion for favoring or abandoning the adoption of a convention. In other words, newer contrary empirical proof may not empirically nullify a formerly adopted convention; however, it may provoke its condemnation, because the convention would be incompatible with the observed reality and thusly no longer convenient as a theoretical presupposition. That is, "*when it ceases to be useful to us—i.e., when we can no longer use it to predict correctly new phenomena*", a principle "*has been extended as far as is legitimate*"; and, even if the experiment does not directly contradict it, still it would have it condemned, because "*the relation affirmed is no longer real*"[622]. In that sense, the relation of a convention with its respective experimental reality – else, the relation between the two dimensions of a scientific theory – bears such significance that may render it inconvenient and, as such, impose its abandonment[623]. The opposite state is also possible: a convention previously abandoned and empirically condemned may regain favor, because its presuppositions have been convenient with present experimental findings[624].

Given these standpoints, Poincare claims that through the concept of convenience conventions are revealed as neither finite, nor a priori eternal ontological principles that should be immune to revision; on the contrary, since not devoid of empirical content, albeit empirically non-justifiable, conventions are constantly brought under discussion and are susceptible to change and substitution. And even if an experiment may not empirically refute a convention, still it may condemn it to abandonment as non-convenient to account for new scientific facts[625].

Therefore, whereas the evaluation for the empirical dimension is based on their justification by scientific facts, the evaluation for the conventional dimension lies with providing convenient ontological presuppositions for relating the observed scientific facts with the respective theoretical framework. What is more, the adoption of a convention is essential to interpret the empirical data in a consistent theoretical framework; under the condition that a convention is given, only then we may answer whether a fact is true or false[626]. This is precisely the meaning of the entanglement between the conventional and the empirical dimensions in scientific praxis.

Following the abovementioned assertions, Psillos concludes that "*conventions are not arbitrary since they are suggested by various empirical considerations, without in any way dictated by, or made probable on the basis of, experience*", whereas "*though they can never be contradicted*

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[621] H. Poincaré, Science and Hypothesis, p. 152

[622] H. Poincaré, Science and Hypothesis, p. 185

[623] This topic is discussed in H. Poincaré, Science and Hypothesis, p. 168-171. For a commentary, see Psillos, Conventions and Relations, p. 110.

[624] H. Poincaré, Science and Hypothesis, p. 182-3. Under these viewpoints, theory-change can be partially explained.

[625] Psillos, Conventions and Relations, p. 110

[626] H. Poincare, The Value of Science, p. 328

by experience, they can be condemned by it and be abandoned as being no longer convenient"[627]. As an example on this state of non-arbitrariness, Poincare provides the laws of acceleration and of the composition of forces: these are conventions with experimental origin, yet not arbitrary; for "*they would be so if we lost sight of the experiments which led the founders of the science to adopt them, and which, imperfect as they were, were sufficient to justify their adoption*" [628]. In the end, non-arbitrariness leads metaphorically to the statement that, when it comes to foreseeing natural phenomena, "*always the scientist is less often mistaken than a prophet who should predict at random*"; for "*science foresees, and it is because it foresees that it can be useful and serve as rule of action*" and, by that means, achieve knowledge as its goal[629].

Therefore, despite being chosen by the human mind, conventions emerge as convenient, thus non-arbitrary ontological presuppositions, capable of supporting the theoretical framework, under the scope of which empirical data is interpreted and scientific knowledge is farther expanded. That being the case, we can ascertain that every scientific theory embodies consistently that dyadic ontology: a conventional-axiomatic dimension and an empirical-logical dimension.

9.2.2. Castoriadis: Axioms as imaginary, yet non-arbitrary, creations

9.2.2.1. Imaginary creations by scientific praxis

Concerning imagination in a scientific framework, Castoriadis fundamentally presupposes that "*under the theories exist, of course, a metaphysical thesis*"[630].

The topic is firstly approached through the development of mathematics. Primarily it is claimed that, initiating from "*a proliferating elaboration or working out of ensemblistic-identitary logic*", mathematics "*would long ago have reached the limits of triviality and insignificance, had it not been for the creative imagination of mathematicians (which expresses itself first and foremost in the positing of* new axioms*), who are founders of branches (arborescences of theorems) other than those that already exist*" [631]. In that sense, "*the freedom of the mathematician's imagination […] is fully comparable in this respect to the freedom of the imagination of the creator of a work of art*"[632], meaning that it creates forms ex nihilo, without being preceded by identitary relation to preexisting figures. What is more, this imaginary capacity "*yields of itself to exigencies that we may formulate – though, in themselves, such requirements provide no* rule*, not only for "inventing" axioms but even for judging immediately and with certainty their* importance"; thus, "*a system of axioms can be anything whatsoever (i.e., arbitrary),* provided that *the axioms are independent and*

[627] Psillos, Conventions and Relations, p. 135. That is the reason why the adoption of non-empirically proven conventions cannot pose the danger of pseudoscience, since they are drawn from experiments and can indeed be overturned by them.
[628] H. Poincaré, Science and Hypothesis, p. 124
[629] H. Poincare, The Value of Science, p. 324-5
[630] C. Castoriadis, False Chaos, Chaos and Cosmos (1993, in Greek), p. 96.
[631] C. Castoriadis, The Ontological Import of the History of Science, p. 367
[632] C. Castoriadis, The Ontological Import of the History of Science, p. 367

noncontradictory" [633]. Nevertheless, as will be shown below, this statement does not solve the problem of their 'coherence' or 'completeness'.

Drawing from mathematics, the same process is adopted also for the axioms in Physics. According to Castoriadis, even if "*a mathematical theory is developed and improved indefinitely without there being any "real world" correlate*"[634], still "*the fascinating, really significant fact [...] is the strange interrelationship between the deployment of mathematics and the history of modern physics*". That is because "*sometimes mathematics would seem to be "preparing" in advance the forms physics "will have need of," sometimes physics "forces" the invention of hitherto nonexistent mathematical forms, sometimes both of these occur together, and sometimes, finally, physics remains at an impasse because no one has succeeded in creating the required mathematical tools*"[635]. As specific examples of axioms for this casuistry, for the first case general relativity is provided, because "*Riemannian geometry and the absolute differential calculus of Ricci and Levi-Civita were already there at Einstein's "disposal" for fifty and twenty years, respectively*"; for the second case the requirements of quantum physics are provided, since "*Dirac had to invent (1926) what Laurent Schwartz was going to make into distribution theory*"; for the third case, an iconic example "*is to be found in Newton, with the invention of analysis and its application to physics*"; finally, the fourth case "*may be illustrated by the obstacles the hydrodynamics of turbulent flows encounters for lack of adequate mathematical tools*"[636]. Consequently, "*this type of relationship between mathematics and physical reality*", along with "*their intertwining and the history of this intertwining*" demands a metaphysical basis that would "*raise a new question and radically displace the space in which this question has been posed as well as the possible responses*"[637].

Under the light of these suppositions, insofar as projecting metaphysical theses, scientific axioms are emerging as creations of the radical imaginary. Whereas chaos "burdens" natural reality with unanswerable questions, an open space is provided for radical imaginary to posit answers under the form of the scientific axioms. Following the intervention by creative imagination, we can deduce that for every scientific theory a metaphysical thesis as arche is presupposed that is embodied by a scientific axiom and provides the answers that allow the development of its logical structure[638]. However, what is rather intriguing is the fact that this metaphysical thesis is itself neither self-evident[639], nor subject to empirical or experimental reasoning and, as such, cannot be evaluated by rational laws, but still serves as an 'arbitrary' – that is, non-logically founded – answer to the principal questions arising in scientific praxis. Correspondently, albeit fundamental, scientific

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[633] C. Castoriadis, The Ontological Import of the History of Science, p. 367

[634] C. Castoriadis, The Ontological Import of the History of Science, p. 368

[635] C. Castoriadis, The Ontological Import of the History of Science, p. 367

[636] C. Castoriadis, The Ontological Import of the History of Science, p. 368

[637] See C. Castoriadis, The Ontological Import of the History of Science, p. 368-9, where is claimed as follows: "*Inherited philosophy […] appears totally devoid of interest, for it lacks an object. It is not just that empiricism or rationalism, critical idealism or absolute idealism appear desperately naive; they are irrelevant, beside the point. They exist in a dream world in which the presuppositions of knowledge are not social-historical and where this knowledge has no genuine history: this is so either because history has been reduced to a cumulation (Kant) or because it is made to depend on a "dialectic" (Hegel) which is in truth its very negation […].*"

[638] C. Castoriadis, Preface (in French), p. 11

[639] C. Castoriadis, Preface (in French), p. 11

axioms do not apply to any logical founding, but still become irreplaceable for any scientific development.

Nonetheless, imaginary does not explicitly mean arbitrary or indeterminate, for the limitations of creation apply herein as well.

9.2.2.2. Non-arbitrariness as an ensidic characteristic

Fundamentally, "*the mode of being of the indeterminate itself is not purely and simply indeterminate*"[640]. That being said, despite that Chaos in Science projects again unanswerable principal questions, still the axioms by the radical imaginary are not arbitrarily taming the indeterminable, but must be compatible with the self-determining and self-determined capacity of the natural and living Being.

In general, that same problematic is also projected upon "*the relation between new and old forms*" and "*the relations among strata of Being/being, and among the beings [*étants*] within each stratum*"[641]. Albeit not answering directly, Castoriadis non-systematically and non-exhaustively gleans some possible indicators for reference, based on which the succession of emerging figures may be elucidated according to some ensidizable order. Such are "*the necessary and sufficient condition (as it is encountered in mathematics)*", "*the simply sufficient condition, what is usually meant by causality*", "*the necessary external condition (the existence of the Milky Way for the composition of* Tristan und Isolde*)*", "*the necessary internal condition (the previous history of Western music for this same piece)*", "*the leaning on psychoanalytic meaning*", "*the leaning on social-historical meaning*" and "*the influence of one thought upon another thought (Plato/Aristotle , Hume/Kant, etc.)*"[642].

Drawing on these viewpoints, let us recall that "*social-historical creation (as well as, moreover, creation in any other domain), if it is unmotivated* – ex nihilo – *always takes place* under constraints *(it does not occur* in nihilo *or* cum nihilo*)*"[643]. Among these constraints, as stated above, the *intrinsic* ones are associated with the *coherence* and *completeness* of imaginary creations and their alignment with the ensidic logic. And since the first natural stratum is essentially ensidizable, it resists intrinsically its formulation by the radical imaginary – at least, to a broad extent. Hence, inasmuch as scientific axioms tend towards taming the chaotic element, their content is constraint by the intrinsic nature of the ensidic logic itself; in that sense, albeit imaginary creations, scientific axioms must be coherent with the existing ensidizable order and, as such, are regarded non-arbitrary.

It is due to these presuppositions that Castoriadis asserts that the physical world is ensidizable – else, mathematizable –, but "*not so "in various ways" (supposedly arbitrary ones, so*

[640] C. Castoriadis, Done and To Be Done, p. 369
[641] C. Castoriadis, Done and To Be Done, p. 369
[642] C. Castoriadis, Done and To Be Done, p. 370
[643] C. Castoriadis, Done and To Be Done, p. 370, where also "*the presence and importance of causality in social-historical life*" is explicitly pointed out.

that "anything goes")"[644]. For example, "*there are not two gravitational theories for ordinary phenomena, from the molecule to the galaxy, there is one and only one*" [645]. In that sense, even if the strata of physical Being/being are heterogeneous, still locally "*each of these strata includes an ensidic dimension – or lends itself, indefinitely, to an ensidic elaboration, to an ensidization*"[646]. Therefore, when a scientific axiom is created by radical imaginary, then it is instantly subject to the ensidic dimension of the strata it belongs and is made logically compatible with the world; thus, it becomes *coherently* connected – positively or negatively – with the rest of the scientific structure and, albeit an imaginary creation, it arises as non-arbitrary.

9.3. Concluding remarks: The scientific Arche as imaginary and non-observable ontological presupposition

In conclusion, following this chapter, it is herein acknowledged that both reality as the scientific object and axioms as the presuppositions for scientific theories share a dyadic ontology: firstly, natural reality bears an ensidizable order that is disrupted chaotically due to the heterogeneity among its ontological strata; secondly, in the attempt to harmonize the opposing elements through the scientific process, this combination of order and chaos renders scientific axioms simultaneously imaginary, but still non-arbitrary.

Given the abovementioned assertions by Poincare and Castoriadis, the thesis hereto adopts the claim that scientific axioms bear a dyadic ontology that embodies simultaneously and entangled a metaphysical and a physical dimension, as discussed above.

Specifically put, we argue that conventions by Poincare are taking on the systemic position of axioms. In other words, the conventional dimension of a scientific theory is actually systemic, freely chosen by the human mind among other equivalent statements and, most importantly, guided by and consistent with its empirical counterpart. However, since strictly empirically neither justifiable, nor revocable, they are associated with empirical reality only through means of convenience and, as such, remain non-empirically grounded. In that sense, following the standpoints already addressed above, conventions are primarily classified to the metaphysical realm as logically inferred, though non-empirically proven, ontological presuppositions; that being the case, they may formulate the *arche* for the development of scientific praxis and the acquisition of scientific knowledge.

In spite of finding none concrete reference to Poincare in his texts, Castoriadis radicalizes this concept of conventions through his ontological theory. In the attempt of scientific praxis to tame the chaotic element existing in natural reality, the principal ontological questions posited cannot be answered definitely, but only non-logically grounded. That is the reason why Castoriadis explicitly suggests that there is a metaphysical basis embodied in every scientific theory that acts as

[644] C. Castoriadis, The Ontological Import of the History of Science, p. 369. Again, as abovementioned, this supposition opposes conveniently the viewpoints drawn by P. Feyerabend and his theory of methodological anarchism.
[645] C. Castoriadis, The Ontological Import of the History of Science, p. 369
[646] C. Castoriadis, The Ontological Import of the History of Science, p. 366

a quasi-definite answer to these unanswerable questions. Nevertheless, following his theory on creative imagination, this answer is not just chosen by human mind, as Poincare claimed, but is created ex nihilo by human imagination; for axioms that serve as metaphysical answers are neither a priori given, nor logically founded, but are firstly formulated as the arche for scientific praxis and then posited as imaginary creations, elevated to a separate, yet still ontological, level of reality.

It is worth to underline that common grounds for both thinkers are the dyadic ontology of the arche and its resultant non-arbitrariness. The empirical dimension for Poincare and the ensidic dimension for Castoriadis are entangled with the corresponding conventional and imaginary dimensions, because the former are guided or constraint by the former. And whereas for Poincare this entanglement is grounded on convenience of convention to experience, for Castoriadis rises as an intrinsic limitation by ensidic logic on imaginary creation. Despite the differences, we can argue that from either side the philosophical project points to the concept of non-arbitrariness, meaning that scientific axioms may be empirically non-justifiable, though still presenting ontological significance. That being said, the metaphysical and the physical dimensions do not merely coexist and certainly not in an antithesis; they are simultaneously intersecting as a functioning dipole and, therefore, should be addressed as multiple dimensions of the same one framework. This conclusion wraps up the meaning of the dyadic ontology of scientific axioms.

Parenthetically, in terms of strict definition, scientific axioms are distinguished from scientific theories. The former signifies the metaphysical theses about the understanding of the world as a scientific object, drawn by scientific praxis but still non-subject to direct empirical – and sometimes even mathematical – justification; the latter stand for the whole scientific statement that embodies the empirical observation and its inductive calculations, rationally connected with the presupposed metaphysical thesis, adopted beforehand.

Finally, concerning the abovementioned topic on the distinction of scientific object between observable and non-observable natural reality, a comment may be herein contributed. Since scientific axioms are not subject to empirical confirmation, then their ontological content remains non-observable; after all, if the scientific statements embodied in an axiom could be actually testified as either existing or non-existing, then such presuppositions – risky as they are – would have been replaced by empirical laws, based on experimental reality. Consequently, inasmuch as the non-observable reality cannot be categorized in scientific sequences, the role of axioms is precisely to impose order to this chaotic standstill and substitute the unknowable with ‘some kind of’ conventional answer – non-logically grounded, yet convenient to serve as the arche for the development of scientific knowledge. In that sense, the arche of scientific praxis, assumed as empirically elusive and hidden in non-observable reality, is drawn out of that chaotic territory through the positing of scientific axioms; therefore, the latter should be capable of – conventionally, though conveniently – substituting the significance of the arche for any scientific sequence and assume its role as the metaphysical foundation for scientific knowledge.

Furthermore, since axioms represent the non-observable Cosmos, then their ontological content may indeed be straddled upon only via imagination. Thus, we may additionally confirm the abovementioned claim that, albeit their association with experience, axioms remain imaginary creations; as such, they are granted the, though imperfect, capacity to conventionally represent what

the human senses alone cannot otherwise grasp. Given that, while any causal sequence remains incomplete due to the missing unknown primaries that reside in the non-observable reality, it is only through axioms that the sequences may be conventionally quasi-complete. That is because the non-observable phenomena can be substituted by positing axioms in their stead, in order for scientific causality to be formally organized and, thus, fully applicable.

That being said, following these deductions, we have roughly elucidated the essential contribution of imagination to scientific praxis and knowledge. Nonetheless, the questions concerning *who* creates the scientific axioms and *how* they are formulated have henceforth multiplied, as we are driven to wonder on the relation between scientific praxis and social imaginary.

10. *Social imaginary arche in scientific praxis: The breakthrough in philosophy of science*

Let us recall that any reference made for imagination does not signify only its radical nature, but also its social dimension. That is the case, insofar as "*every society defines and develops an image of the natural world, of the universe in which it lives, attempting in every instance to make of it a signifying whole, in which a place has to be made not only for the natural objects and beings important for the life of the collectivity, but also for the collectivity itself, establishing, finally, a certain 'world-order'*". Correspondingly, when Castoriadis claims that scientific axioms are imaginary, non-arbitrary creations, this endeavor can only be made possible when viewed under the scope of social instituting imaginary and its social imaginary significations. Of course, this presupposes that scientific praxis bears intrinsically a social-historical dimension, from which originates the history of science and the social individual capable for scientific knowledge.

In this chapter, it is fundamentally suggested that scientific answers are not purely scientific, but also share a social imaginary dimension. However, the assumption that the social-historical solves cosmological riddles and universal mysteries raises more questions than would answer.

10.1. First natural stratum and social imaginary: Extracting the source of ensidic logic

Going back to the properties of first natural stratum, Castoriadis was assessing a dialectic relationship between its essence and social instituting already from his first major work in 1975. Specifically put, he was claiming that first natural stratum consists of facts that are given in nature and result "*neither from the legislation of transcendental consciousness nor from the institution of society*"[647], yet the institution of society is always obliged – "*under penalty of death*"[648] – to take

[647] C. Castoriadis, *The Imaginary Institution of Society*, p. 229

into account the natural facts, because nature constitutes a given organization that "*puts stops or limits*" on the instituting society[649]. Therefore, social institutions are regarded as *leaning on* the first natural stratum, because "*a natural fact can provide support or stimulus for a particular institution or signification*"[650], as a point of reference for the social imaginary significations; hence, society is not absolutely free due to the invariant of natural reality, which resists and cannot be arbitrarily manipulated[651].

Nonetheless, in order for first natural stratum to be taken into account, its content is transformed into social imaginary significations and, as such, cannot be deduced or derived on the basis of the natural fact; for, despite natural facts being always and everywhere the same[652], the claim that through mathematics and physics we "*have created or produced a structure as neutral, as indifferent—once it is* hypothesized*—to the particularities of our society and of every society*" seems rather doubtful[653]. That is because "*society has to create* de novo *and at new expense something that* resembles *the basic natural data (those of life) but in no way is the copy or the replica thereof*"[654]. That being said, passages from the natural to the social and vice versa from the social to the natural are deduced, for natural reality "*not only resists*", but also "*lends itself to transformation*"[655] by the social imaginary.

Therefore, in order to attain its essential functional structure, the instituting society accomplishes a "*reconstitution of an explicit ensidic (ensemblistic-identitary) dimension*", which essentially "*leans on the being-thus of the first natural stratum*" [656]. However, this ensidic element is merely extracted by the first natural stratum, while remaining "*far from "reproducing" purely and simply, and even from reproducing at all, the ensidic logic of the living being*"; that is because "*the ensidic dimension of society is, each time, decisively codetermined by what, in the institution of this society, is* not *ensidic: the properly imaginary, or poietic, dimension*"[657]. In addition, in spite of the fact that "*the world includes an ensidic dimension", still the world itself "is not an ensidic system*"; that is because "*it includes the human imaginary, and the imaginary is not ensidic*", whereas "*the application of the ensidic to the world has a history, which would become unintelligible if the world were wholly ensidic*"; besides, "*even supposing that the world were reducible in an exhaustive way to an ensidic system, this system would be suspended in air since it*

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[648] C. Castoriadis, *The Imaginary Institution of Society*, p. 202. See also C. Castoriadis, The Ontological Import of the History of Science, p. 355

[649] C. Castoriadis, *The Imaginary Institution of Society*, p. 121, 229, 233

[650] C. Castoriadis, *The Imaginary Institution of Society*, p. 230

[651] C. Castoriadis, *The Imaginary Institution of Society*, p. 234, 353-4

[652] C. Castoriadis, *The Imaginary Institution of Society*, p. 205, 229, 234, 353

[653] C. Castoriadis, The Ontological Import of the History of Science, p. 356. After all, Castoriadis explicitly pointed out that "*even in this case, the ensidic logic created by society is* not the same *as the one involved in the operations carried out by the living being—whereas there exist other strata of nature in which they coincide completely (everything in nature, for example, that pertains to rational mechanics)*".

[654] C. Castoriadis, The Ontological Import of the History of Science, p. 356-7

[655] C. Castoriadis, *The Imaginary Institution of Society*, p. 354

[656] C. Castoriadis, The Ontological Import of the History of Science, p. 354

[657] C. Castoriadis, The Ontological Import of the History of Science, p. 354-5

would still be impossible to account ensidically for its ultimate axioms and its universal constants"[658].

Thus considered, Castoriadis suggests that "*the world* tout court *includes within itself a dimension that not only lends itself to an ensidic organization but corresponds to such an organization*", the understanding of which of course "*is socially instituted*", but still "*would be objectless if the world were pure multiplicity of the manifold, of the absolutely diverse*"[659]. Hence, since science aims to discover the ensidizable order of the first natural stratum, scientific praxis itself bears a distinct social-historical dimension that embodies a respective instituting imaginary arche.

10.2. The social-historical dimension of scientific praxis in general

Correspondingly, as every human activity, science can be developed only in and through the social-historical field, whose existence precedes and is presupposed for any notion of scientific knowledge. In general, following that scientific knowledge "*(in what is certain for it* as well as *in what is uncertain for it) changes [*s' alteére*] over the course of time*", "*it is not a matter of a state, of a sum or completed system of truths, but rather of a process*", which emerges as "*essentially social-historical*"[660].

Specifically put, science is characterized as social, because "*the human individual, be that individual scientific (or philosophic) […] exists only as the product of a perpetual process of socialization; it is first and foremost a walking fragment of the institution of society in general and of particular society*"[661]. In addition, it is termed as historical "*in the sense that it itself alters itself [*elle saltére elle-méme*], that it is not only self-creation once and for all but continued self-creation, manifested both as incessant imperceptible self-alteration* and *as possibility, and actuality, of ruptures that posit new forms of society*"[662].

Science's social-historical character is exemplary projected through the use of scientific language. Without language, "*there is no process of knowing […] (this being true even of mathematicians)*"; consequently, there is "no *thought without language, no language that is pure* code *(pure formal system), no knowledge reducible to the handling of algorithms*"[663]. That being said, as already elaborated above, inasmuch as language "*is, each time, "total part" of the social-historical world in question*", there can be "*no language whose organization and tenor would not be consubstantial with the imaginary significations of the society under consideration, with its*

[658] C. Castoriadis, Done and To Be Done, p. 364
[659] C. Castoriadis, Done and To Be Done, p. 364
[660] C. Castoriadis, The Ontological Import of the History of Science, p. 342-3
[661] C. Castoriadis, The Ontological Import of the History of Science, p. 343
[662] C. Castoriadis, The Ontological Import of the History of Science, p. 343-4. As an example especially concerning the historical succession of scientific systems, "*to understand the historical sphere [*l' historique*] requires that we contemplate (without stopping at some "explanation," beyond "explanations") the abyss that opens when we ask ourselves […] of quantum physics with the physics of the eighteenth century*".
[663] C. Castoriadis, The Ontological Import of the History of Science, p. 343

grasp on and organization of the world, with its own manner of making sense *of what is given—and, to begin with, to the roughest and most decisive of degrees, of* making *"the given"* be *for it, doing so already through its language operations*"; after all, "*there certainly are no gatherings of any sort of "information," binary or otherwise, that would be scattered throughout nature as if it had been waiting there merely for the first humans to come along to harvest and store it*"[664].

Consequently, it is deduced that we come across again a dyadic, yet irreducible multiplicity. On the one hand, "*the institution of society, of every society, has to, under penalty of death, establish a "functional" relationship with the first natural stratum*"; for "*inasmuch as, on Earth, this first natural stratum is everywhere "the same," there will be, due to this very fact, some "common elements" in at least certain articulations […] across diverse societies (in time and in space)*" [665]. This ascertainment of common elements regardless of the social-historical secures the existence of "*a virtual universality of human history*" in the form of "*the signitive relation*" [666]. On the other hand, this signitive relation, being the core of ensidic logic, does not emerge solely from the first natural stratum; "*for, as instituted by each society, this ensidic dimension is totally immersed in the magma of imaginary significations of that society*" [667] and, hence, "*as it is reconstituted and instituted by society seems quite different from the ensidic as we encounter it in nature*"[668]. Therefore, despite the seemingly universality of the first natural stratum, its common understanding is obstructed by the diversity of social-historical Eigenwelten. Especially under the scope of language, as abovementioned, "*"one" signifies* one *(and yet,* what *does* one *signify?) throughout different languages only in its usage as an element of a code*"[669]; beyond this very primitive ensidic dimension, these common elements produce a respectively "*genuine comprehension and elucidation*" and are "*never "naturally"* given", but "*always to be conquered*"[670].

In all fairness, we do claim that from its essence the first natural stratum implies common elements that are indeed ensidizable at the broadest humanly possible manner and are rendered less dependent from social instituting. That being said, whereas in general social institutions emerge regardless any rational origins, specifically the instituting of scientific laws faces immense and prevailing external constraints and intrinsic necessities, due to which their formulation follows strict

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[664] C. Castoriadis, The Ontological Import of the History of Science, p. 343

[665] C. Castoriadis, The Ontological Import of the History of Science, p. 355. The example provided is that "*whatever its religion […] a pastoral society can* never *kid itself into believing that cows, sheep, and goats are impregnated solely by the action of spirits, etc*".

[666] See C. Castoriadis, The Ontological Import of the History of Science, p. 355, where is also stated that, given the essential presence of the signitive relation, "there are*, everywhere, words for the primary elements at least of the set [*ensemble*] of natural integers, or for the sky and the stars, or for hot and cold, and so on*".

[667] C. Castoriadis, The Ontological Import of the History of Science, p. 355

[668] C. Castoriadis, The Ontological Import of the History of Science, p. 356

[669] C. Castoriadis, The Ontological Import of the History of Science, p. 355. To that end, Castoriadis provides the following example: "*The pious Christian shopkeeper would never accept one dollar instead of three – whereas he confesses the equality of one= three at least every Sunday, and he does so with no "split" in his psyche. And of course, these imaginary significations, in which the ensidic in its instituted form itself takes part, are in no way superimposable, congruent, or mutually reducible between different societies (for example, Brahma, Shiva, and Vishnu have no relation at all to the Christian Trinity)*".

[670] C. Castoriadis, The Ontological Import of the History of Science, p. 355-6

scientific deontology and depends decisively on – though, not determined by – the empirical data. In that sense, insofar as the creative capacity of the scientific community is constraint, the organization of the first natural stratum originates more from scientific data and less from imaginary parameters; as such, in contradistinction to other social institutions, the scientific theories that organize the first natural stratum are the least affected from the social imaginary of their respective Eigenwelt. Consequently, the image of the Cosmos depicted by instituted theories is the closest possible approach to natural reality humans may hope to accomplish during that respective historical period. Besides, even though scientific deductions change according to new contradicting observations[671], instituted scientific laws still hold the most reliable method for understanding natural reality.

Under the light of these presuppositions, the social-historical dimension of science indicates its dependence to the human Eigenwelt. And whereas the human world is developed upon its respective social imaginary significations, scientific praxis shares that same imaginary arche through the instituting of scientific axioms.

10.3. Scientific axioms as instituted social imaginary significations: Reflections on the history of science

Inasmuch as principal ontological questions concerning the essence of the natural world arise, they can only be posited by the social-historical; and inasmuch as scientific axioms provide answers to these questions, they consist of instituted imaginary significations, born by the imaginary capacity of their social-historical and bound to its constraints.

Thus seen, the primary source of scientific praxis originates from a social imaginary arche that resides in the beginning of every logical syllogism. That same arche forges the axioms that are presupposed for any scientific attempt to logically relate the human social world with the pre-social world of the first natural stratum; and since the former is always leaning on – yet not determined by – the latter, the type of this relation depends on the instituting manner of every social historical. For "*the "logical/physical" operations through which every society relates itself to the first natural stratum, organizes it, and makes use of it are always under the sway of its social imaginary significations, which are at once "arbitrary" and radically different in different societies*"; what is more, even "*the constraints that the physical world imposes on the organization of the living being supply an essential part of our understanding of this organization*", whereas "*that which the natural world as such insuperably dictates that society – and thereby, all societies – do or forbids society from doing is utterly trivial and teaches us nothing*"[672].

[671] After all, the progressiveness of scientific deductions is in harmony with the self-alteration of social institutions, rejecting thusly any intention for absoluteness by all means.

[672] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 10

That being the case, the natural reality as a socially instituted object becomes susceptible to "*a sui generis organization*"[673]. This is because, given the diversity and plurality of societies, the first natural stratum "*has to be such that it is able to support (and lend itself to) an indefinite multitude of organizations that, each time, correspond to an* other *institution of society, each with an ensidic dimension particular to it*" [674]. Therefore, concerning the emergence of scientific axioms, social imaginary elucidates natural order through "*re-creation and construction, by society, of an ensidic dimension that actually reaches [*atteint*] the first natural stratum without in any way being a "copy" thereof*" and through "*first questioning of this ensidic dimension's permeation by the inherited/instituted imaginary, and creation of* logos *and of* logon didonai" [675] – that is, to provide logical grounding for every theoretical statement.

In order to elucidate the historical development of scientific knowledge, Castoriadis denies the notion that presents "*the whole of the history of humanity as a cumulative 'learning' process across generations and social forms*"; given this viewpoint, the process of 'learning' is interpreted "*as a more or less successful form of* 'problem-solving' *and to connect the latter with a 'process of rationalization'*"[676]. However, the assumption that "*there might be 'cumulation' and 'progress'*" points directly to "*the incredible, even though banal, idea that there is a 'meaning' of the world and that we are gradually approaching it*"[677] – a traditional idea worthy only of rejection[678]. Instead, the problem of meaning associated with scientific development unlocks the process of "*creating a ('natural' and 'social') world invested with signification*" [679]. Knowledge becomes thusly not a matter of 'accumulative learning', but a matter of "*this capacity for creation that makes it invent new forms of behaviour, as well as to receive, should the case arise, the new*"; after all, "*receiving the new has nothing to do with any sort of learning, since such reception amounts, at minimum, to a massive and sudden modification of the already established 'subjective' mechanisms (in a process where 'trials and errors' play practically no role)*"[680]. In that sense, when seen under the historical scope, scientific knowledge is not just the result of accumulative learning from the errors of the past, but more importantly a creation of historically new viewpoints on the natural world.

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[673] C. Castoriadis, The Ontological Import of the History of Science, p. 357

[674] C. Castoriadis, The Ontological Import of the History of Science, p. 357.

[675] C. Castoriadis, The Ontological Import of the History of Science, p. 370

[676] C. Castoriadis, Done and To Be Done, p. 382-3

[677] C. Castoriadis, Done and To Be Done, p. 383

[678] See C. Castoriadis, The Ontological Import of the History of Science, p. 368-9, where is claimed as follows: "*Inherited philosophy […] appears totally devoid of interest, for it lacks an object. It is not just that empiricism or rationalism, critical idealism or absolute idealism appear desperately naive; they are irrelevant, beside the point. They exist in a dream world in which the presuppositions of knowledge are not social-historical and where this knowledge has no genuine history: this is so either because history has been reduced to a cumulation (Kant) or because it is made to depend on a "dialectic" (Hegel) which is in truth its very negation […].*"

[679] C. Castoriadis, Done and To Be Done, p. 383

[680] C. Castoriadis, Done and To Be Done, p. 382. In all fairness, Castoriadis admits that a partial exemption lies with the ensidic dimension, which could be characterized by accumulative progress. Nonetheless, that would be an actual case, "only *if we reduced the world and human life to ensidic entities - which is clearly absurd*"; besides, "*even in relation to this ensidic dimension we cannot forget that such 'progress' and its maintenance refer back to philosophical questions of capital importance*" (p.383).

In an attempt to clarify the relationship of social imaginary and science, Castoriadis argues that this *sui generis* organization "*does not halt at the first natural stratum*", for "*it really seems to concern the totality of "natural" Being/being accessible to us*"; and that is precisely "*what is shown by the* history*, in strong sense, of science*", the birth of which is situated "*within the more general context of the ensidic organization of all societies*"[681]. That is the reason why Castoriadis elucidates this problematic by turning to two historical examples grounded by other social imaginary significations: the birth of science in ancient Greece based on the infinite ('*apeiron*') and the developments of the modern Western science based on artificiality.

Firstly, the birth of science historically occurred in ancient Greece, when "*something becomes detached from "common knowledge"—or from the "secret knowledge" of priests and magicians – and tries to become human* epistémé*, and* public epistémé*, open to all those who are willing and able to work at it*"; and this detachment came with "*two exigencies, along with the exploration of the possibility of satisfying them, which characterize what we understand by rational thought: unlimited interrogation, on the one hand; proof, whatever its means maybe, on the other*"; thus was formed the concept of *logon didonai*, meaning "*giving an account of and a reason for*"[682].

However, the presupposition for that historical rupture was the emergence of infinite as the dominating social imaginary signification in the social-historical of Greek antiquity[683]. As already elucidated above, the infinite – else, *apeiron* – encapsulates "*that which has no* peras*, term, limit, determination, both contravenes the central interpretation of being as determinacy and, in Greek,* says on its own *that it is unknowable*"[684]. Drawing from the mathematical developments of Eudoxus, as illustrated by Euclid, Castoriadis concludes that "*in mathematics the Greeks never accepted proofs other than those that today would be called* finitist *or* constructivist". On the contrary, precisely based on the *apeiron* as the social imaginary arche, Castoriadis roughly observes that ancient Greeks were adopting a distinct "*lack of interest in the "artificial""* and especially for "*the* theoretically artificial"[685].

Secondly, "*modern science appears as the subjectively and objectively unlimited (and, without any doubt, interminable) elaboration of ensidic logic and of the strata the latter discovers/constructs within the "real""*; that is because this "unlimitedness *of modern enquiry no doubt itself depends on an imaginary schema of the* thoroughgoing rationality *of physical Being/being – a schema foreign to the Greeks (in any case, up to and including Aristotle)*"[686]. Consequently, artificiality as the leading scientific axiom emerges and "*leads to a transformation of the very essence of the mathematical "object," culminating in the "free positing" of axioms – unthinkable for the Greeks, for whom (as again for Kant) these axioms express intrinsic or "natural" (be they "subjective") properties of space, not arbitrary positions subject [*soumises*]*

[681] C. Castoriadis, The Ontological Import of the History of Science, p. 357
[682] C. Castoriadis, The Ontological Import of the History of Science, p. 358-9
[683] C. Castoriadis, The Ontological Import of the History of Science, p. 359
[684] C. Castoriadis, The Ontological Import of the History of Science, p. 359-60
[685] C. Castoriadis, The Ontological Import of the History of Science, p. 362, with the ironic exemption of "*the extraordinary machinery of war*", being "*a rather easily understood exception*".
[686] C. Castoriadis, The Ontological Import of the History of Science, p. 363

simply to the constraints of independence, noncontradiction, and, possibly, completeness"[687]. Besides, in addition to artificiality, contemporary societies adopt arithmetic as their primary scientific project. Even if "*there is not and cannot be a "rational" basis" for its domination*", still "*quantification is merely the expression of one of its dominant imaginary significations: whatever cannot be counted does not exist*"[688].

Quite intriguing is, subsequently, the association of this unlimitedness of modern science with "*the unlimited expansion of "rational" mastery (instrumented, to begin with, in the unlimited expansion of productive forces)*" as the central imaginary signification of capitalism[689]. That is to say, "*a deployment of science of the kind displayed by Western science, since, let us say, Galileo, would not be possible* either *"in any universe whatsoever"* or *for "no matter what society" formed by the accidental and inessential incarnations of a consciousness in general*" – thusly disclosed "*both in the being of its object and in the being of its subject*"[690]. Therefore, artificiality as a central scientific axiom is preceded and founded by the social-historical as formulated by the imaginary significations of capitalism; it was only in this Western social framework that Western science could have been surging forth.

Under the light of these statements, Castoriadis deduces the dyadic – again – ontology that is incorporated in the history of science. On the one hand, scientific knowledge is historically developed through "*the deployment, the elaboration of ensidic logic*", the progression of which "*has in truth been a re-creation and reconquest of the organization of the first natural stratum*"[691]. On the other hand, scientific knowledge "*has been dependent, each time, on the magma of imaginary significations of the society being considered*"; as such, its advances "*occur, in the great cases, through* ruptures*, or by the emergence/creation of new schemata or imaginary matrices that refer to the "real world" (or not, as in the case of mathematics)*"[692]. These ruptures arise as the key concept concerning the instituting of new, other scientific axioms that serve as the metaphysical basis for the subsequent theories.

Ultimately, these distinct differences among other social-historical Eigenwelten manifest the impact of the dominating social imaginary arche on the scope and the means of the respective scientific praxis, along with the ruptures that characterize the history of science and allow the emergence of new scientific axioms. Nonetheless, this conclusion herein does not halt the

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[687] C. Castoriadis, The Ontological Import of the History of Science, p. 363

[688] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 11

[689] C. Castoriadis, The Imaginary: Creation in the Social-Historical Domain, p. 15. See also C. Castoriadis, The Ontological Import of the History of Science, p. 363

[690] C. Castoriadis, The Ontological Import of the History of Science, p. 363

[691] C. Castoriadis, The Ontological Import of the History of Science, p. 370. The problem is that this aspect, when reflected separately, "*has nourished the illusions associated with ideas of progress, the fiction of an asymptotic approach, the naivetés (still found in Kant) about the cumulativeness and additivity of science*", often viewed "*from a "pragmatic" standpoint as growth of an instrumental rationality*".

[692] C. Castoriadis, The Ontological Import of the History of Science, p. 370. Castoriadis also comments that the vain attempt "*to detach the ensidic from all else*" is a consequence of the current Western imaginary magma, under the scope of which "*the simply logical, the simply instrumental, the simply formalizable have become dominant imaginary significations*"; however, even during this period, "*advances do not and cannot occur by simple elaboration of the ensidic – still less, of course, by accumulation of experimental results and observations*".

philosophical interrogation, for this dimension reveals the problematic concerning the historical succession of scientific theories as a sequence of creation.

10.4. Historical succession of scientific theories: A sequence of creation

Inasmuch as science is indistinguishable from the respective social imaginary significations, its historical unfolding bears also an irrefutable role to its development. That said, the history of science can only be thought of as a sequence of creation, upon which "*our thought itself is creation, related with Being-thus and its "object"*"[693]; in addition, the same rupture that characterizes history is also ontologically shared by the history of science.

These social-historical standpoints do not remain merely theoretical, but arise as rather concrete. Fundamentally, Castoriadis claims that "*scientific theories are succeeding one another*", because "*regularly the accepted theories are revealed as "false" or as not "true", as supposed when formulated*"; however, this succession is performed under "*neither order, nor disorder*", since "*the new theories are not better approximations*", but bear "*an other logical structure and different metaphysical presuppositions*"; these other constituents are not just "*added to the previous*", but "*they refute and surpass them*"; and that is the case, despite that "*the previous theories are not purely and simply "false"*", but just "*corresponding to a part or stratum of the formal or real object*", which nevertheless "*does not yield to be integrated without problems to the broader parts, whereto subsequent theories access*"[694]. In other words, when subsequent theories emerge, they do not essentially elucidate a wider image of reality, but they fundamentally posit an apparently *other* problematic of reality – or entirely other aspects of the same problematic[695]. That statement validates precisely the abovementioned thesis that scientific knowledge is developed by a creative process of historically new viewpoints on the natural world – not a result of 'accumulative learning' or simple progress. For the succession of scientific theories originates from ruptures in the history of science that allow 'some' discontinuity; and these ruptures are capable of changing the scientific problematic in comparison to the past adopted theories and produce new, other theories.

Alternatively, the relationship among past and subsequent scientific theories has been similarly approached by the supporters of scientific realism in philosophy of science by focusing the importance of past theories for the development of the subsequent theories. According to their

[693] C. Castoriadis, Preface, p. 22

[694] C. Castoriadis, Preface, p. 11-2

[695] See C. Castoriadis, Science moderne et interrogation philosophique (in French), p. 216-7, where is stated that "*even in the case of mathematics […] it is difficult to speak of simple generalization*", whereas as an example is provided that "*the passage from Euclidean geometry to non-Euclidean geometries […] can be considered as "generalization" only from a formal and empty point*"; thus, "*in order to actualize this passage, [human thought] needs not to generalize, but to radicalize, not just the mathematical category of space, but the same conception of what is mathematics and its object*".

metaphysical thesis, the world has a definite and mind independent natural-kind structure[696]. The reason why natural structure has been historically conceived differently is due to the validity of scientific theories, not to a change of nature itself; and because of this argument the presentation of natural laws is under constant debate. In addition, according to their epistemic thesis, mature and predictively successful scientific theories are well confirmed and approximately true of the world[697].

However, aiming for safer deductions scientific realist theories suggest a hierarchy among the existing natural laws, particularly in favor those that are 'mature and predictively successful'. To that end, according to S. Psillos, it is the mission of scientific realists to ascertain that "*there has emerged a rather stable and well-supported network of theoretical assertions and posits which is our best account of what the world is like*"[698]. Furthermore, "*there is a host of entities, laws, processes and mechanisms posited by false theories – such as the gene, the atom, kinetic energy, the chemical bond, the electromagnetic field etc. – which have survived a number of revolutions to be retained in current theories*"[699]. Under the light of this claim, among the prerequisites, to which more approximate to truth theories must comply[700], stands *maturity*. This term signifies the state, according to which "*theories have passed the 'take-off point' (Boyd) of a specific discipline*"[701]; thus, they are hereinafter posited as (or conjoint with) "*a body of well-entrenched background beliefs about the domain of inquiry which, in effect, delineate the boundaries of that domain, inform theoretical research and constrain the proposal of theories and hypotheses*"[702]. As a result, genuine empirical success[703] is a fundamentally primary demand[704] for mature theories.

Moreover, even if surpassed by newer theories[705], the fact that past theoretical constituents become stable invariants despite the historical trial indicates their maturity, inasmuch as "*theoretical constituents which make essential contributions to future successes are those that have*

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[696] S. Psillos, *Scientific realism* (no. 60), p. xix. See also S. Psillos, Scientific realism and Metaphysics, in *Ratio (new series)*, XVIII, 2005, Blackwell Publishing Ltd., Oxford, p. 385, and F. Gironi, Of Realist Turns-A conversation with Stathis Psillos, in *Speculations*, 2012, p. 367-8.

[697] While defending against the pessimistic induction of Laudan, Psillos, in Scientific Realism, p. 103, defines that "*a theory is approximately true if it describes a world which is similar to the actual world in its most central or relevant features*". In that sense, "*past successful theories, although strictly speaking false, have been approximately true*" (p. 103).

[698] S. Psillos, Scientific Realism, p. 104

[699] S. Psillos, Scientific Realism, p. 104

[700] For further elaboration on the problematic see S. Psillos, Scientific Realism, pp. 105-113, according to whom *non-adhoc-ness* marks the second major prerequisite. For an alternative approach to the topic, see also B. Ellis, *Scientific Essentialism*, 2001, Cambridge University Press, Cambridge, who claims that natural properties are themselves the truth makers of their ontology (p. 217). That is to say, causal processes are driven by intrinsic natures of things that are directly involved with them (p. 223-4). Therefore, since intrinsic properties are regarded as essential properties, they constitute the criteria to distinguish scientific theories.

[701] S. Psillos, Scientific Realism, p. 107

[702] S. Psillos, Scientific Realism, p. 107

[703] S. Psillos, Scientific Realism, p. 105

[704] Aspects of empirical success are the well-established nature on the field developed, the duration without empirical rejection, the survival despite intensive testing etc.

[705] For the problematic concerning the alternation of scientific theories, see also n. 82 below.

an indispensable role in their generation"[706]. On the contrary, "*the theoretical constituents to which realists need not commit themselves are precisely those that are 'idle' components, impotent to make any difference to the theory' s stake for empirical success*"[707]. To that end, S. Psillos introduces what he calls the *divide et impera* move, claiming that, even if past theories are bound not to be henceforth truth-like, "*the theoretical laws and mechanisms which generated the successes of past theories have been retained in our current scientific image*"; that is, not all but some theoretical constituents "*have been retained as essential constituents for the subsequent theories*"[708]. Hence, even if an empirically successful theory has been abandoned, it is still "*reasonable to believe that the theory has* truth-like constituent theoretical claims"[709]. Therefore, we come across the same kind of continuity, found also in the general field of social institutions, especially under the scope of creation ex nihilo; whereas institutions originate autogenously while incorporating a past tradition, thus the same mechanism is addressed when past scientific theories "*fuel*" the future successful theories[710].

Iconic examples can be historically drawn by theories on force and the mechanics of motion. Firstly, since "*to Be is to be determined*", for the ancient Greeks the essential determination of Being lied with "*its place: the answer to* Where? *[…] is categorial*"; hence, Aristotle in particular adopted the axiom that "*everything has its finality, its* telos *which is its nature; a "material" thing consequently has a* natural place *– where it finds itself, or else where it is of itself naturally carried*"[711]. Correspondingly when it comes to physics, "*force, like cause, is therefore that which provokes a change of* place *– whether it be "natural," and lead the thing to its natural place, or it be "nonnatural," "violent," and lead the thing elsewhere than to its natural place*"[712]. Therefore, according to Castoriadis, Aristotle's axiom on force as the cause that results in a change of place is grounded on the – presumably socially instituted – presupposition, that Being is determined spatially and its place in the natural world stands in accordance to the respective teleology.

In order for Aristotle's theory of force to change and be succeeded by Newton's mechanics, the instituted terms under which the former essentially determines the Being are required to be replaced by those of the latter. Rupturing the continuity of Aristotelian physics, Newton adopted the presupposition that, firstly, "*it is not place that belongs to the essential determinations of a thing, but rather its state of movement*"; secondly, that "*the "natural state" of this movement […] is not the zero of movement but rectilinear and uniform movement, of which zero movement is only a particular case*"[713]. Consequently, Newtonian mechanics were grounded on the axioms that "*there*

[706] S. Psillos, Scientific Realism, p. 110. After all, "scientists themselves tend to identify the constituents which they think were responsible for the success of their theories" (p. 112) and it is those believed "to contribute to the successes of their theories (and hence to be supported by the evidence) that tend to get retained in theory change" (p. 112).

[707] S. Psillos, Scientific Realism, p. 110. Correspondently, "the constituents that do not 'carry-over' tend to be those that scientists themselves considered too speculative and unsupported to be taken seriously" (p. 112-3).

[708] S. Psillos, Scientific Realism, p. 108

[709] S. Psillos, Scientific Realism, p. 109

[710] S. Psillos, Scientific Realism, p. 110

[711] C. Castoriadis, The Ontological Import of the History of Science, p. 360

[712] C. Castoriadis, The Ontological Import of the History of Science, p. 360

[713] C. Castoriadis, The Ontological Import of the History of Science, p. 360

can be no "natural place" for anything whatsoever", that "*force is cause not of movement but of change of the state of movement*" and, finally, that "*infinite uniform rectilinear movement had to be possible*"[714]. In that sense, when strict spatial determination was surpassed, arose a new axiom that acknowledged force as the cause for the change of movement, not just the change of place.

Furthermore, the next transition on the field of mechanics and motion lies with the subsequent cosmological viewpoint, introduced by Albert Einstein and his theory of Relativity. Primarily Castoriadis assumes that "*the theory of general relativity had as the point of departure the intention of Einstein to rigorously incorporate to theoretical Physics something that until then remained a "coincidence", the identity of gravitational mass with the inertial mass (principle of equivalence by Mach)*"; thus considered, Einstein "*succeeded in emptying of any content the Newtonian concepts of space, time and matter*", whereas his equations "*obligate physicists to resurrect the enigmatic terms of the* arche *of time, or of circular time, and eventually pose the question of the objective reality and the signification of time*"[715]. In that sense, Castoriadis concludes that the theory of relativity "*posits from the beginning as axiom the absurdity of the fundamental implicit axiom of the Newtonian theory: the possibility of propagating signals at infinite velocity*"[716].

That being the case, we witness again that historical succession from Newton to Einstein is established on a change in the respective axiomatic presuppositions: insofar as time ceased being linear, then the whole structure of mechanics and motion are bound to a corresponding, yet groundbreaking, change. Nonetheless, in terms of history of science, Castoriadis argues that "*one does not pass from Newton to Einstein by continuous transition*"; on the contrary, the difference between Newtonian theory and relativity is founded on a qualitative categorical level, not on a strictly arithmetical level, since "*to make the passage, one must replace "it is true that* P*" with "it is not true that* P"[717]. In other words, ironically stated, "*to present the first as a "less good approximation" than the second is to ignore the heterogeneity of the postulates and theoretical structures of the two conceptual models, and to speak not as theoretical physicist but as a decimals cook*[718]".

The aforementioned suppositions, along with the respective examples, support the hereby thesis that the succession of fundamental presuppositions is not merely scientific, but additionally and primarily socially instituted. Firstly, as already delivered, the emergence of subsequent theories may posit an entirely other image of scientific reality. Secondly, this rupture of the scientific image is based on the assertion that subsequent theories adopt other axioms as their arche, hence other metaphysical basis. After all, it is commonly asserted by Castoriadis that "*every physical theory presupposes an ensemble of categories that are not self-evident and not a neutral framework, consequently that posit the question of their interpretation*"[719]; what is more, any obstacles for the

[714] C. Castoriadis, The Ontological Import of the History of Science, p. 360-1
[715] C. Castoriadis, Science moderne et interrogation philosophique (in French), p. 211
[716] C. Castoriadis, Science moderne et interrogation philosophique (in French), p. 216
[717] C. Castoriadis, The Ontological Import of the History of Science, p. 366
[718] C. Castoriadis, The Ontological Import of the History of Science, n. 33, p. 436
[719] C. Castoriadis, Science moderne et interrogation philosophique (in French), p. 214

historical transition of the corresponding scientific theories lie primarily with "*the ineluctable necessity to place under doubt or abandon the most elementary categories and the most elementary means of conceptualization*"[720].

If we add social imaginary to the problematic, we can claim that the historical succession of scientific theories is followed by a historical transition of the social imaginary significations that reside in the social-historical. That said, when our social norms and values change, then our scientific image of the Cosmos changes; that is because, being social significations, the axioms that serve as the metaphysical basis for scientific praxis have become other that those supporting the past viewpoints on natural reality. In that sense, the social imaginary arche that structures a respective human Eigenwelt determines the scientific presuppositions, in accordance to which an observing social individual theoretically perceives and scientifically understands its natural environment. It is for this reason that Castoriadis refers to E. Wigner and N. Bohr, who were claiming that "*our science cannot stand entirely on its feet, it is profoundly anchored to the common concepts that we acquired during our childhood or were born with us and are utilized in our everyday life*"[721].

Furthermore, due to their metaphysical origin, these subsequent other axioms emerge as a rupture in the history of science. This series of essential ruptures reveals what Castoriadis understands as "*the internal logic of this history: the logic of imaginary creation under the twin constraints of reference to the "real", on the one hand, of "continuity", on the other, with this imaginary itself encompassed by the imaginary of society and of the historical period in which it is anchored*"[722]. That is the reason why "*the axioms, basic concepts, and logical structure of the corresponding theories are other*", signifying "*a lack of relationship*"; and "*this change in axioms, at the level of theory, corresponds to a fracture at the level of the object*" – even if empirically "*there is no positive incoherency*" [723]. Given this standpoint, new theories are manifested from a historical rupture that is provoked by the instituting imagination of the social-historical in question; and since theories are based on instituted axioms, these rupture in the history of science is preceded by a rupture in the history of the social-historical that allowed the creation of other social imaginary significations, capable of formulating again the respective human Eigenwelt. Based on the terminology hereby adopted, we could claim that the scientific axioms constitute the social imaginary significations, instituted by the social historical, based on which the scientific theories are built as logical sequences via the ensidic logic; and the ex nihilo creation of the former through

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[720] C. Castoriadis, Science moderne et interrogation philosophique (in French), p. 211

[721] C. Castoriadis, Science moderne et interrogation philosophique (in French), p. 224. The reference is drawn by E. Wigner in *Foundations of Quantum Mechanics (Proceedings of the International School of Physics. Enrico Fermi. Course IL)*, 1971, p.18, edited by B. d' Espagnat, Academic Press, New York and London.

[722] C. Castoriadis, The Ontological Import of the History of Science, p. 371. In any case, Castoriadis makes the following point: "*We should be wary of every generalization about the history of science: we cannot talk about it as if our statements could be verified in an indefinite number of cases; in a sense, our object is hardly more than four centuries old, and it includes, perhaps, four or five genuine "revolutions," to use Kuhn's term. Nevertheless, this history itself should no longer be presented as a series of chess games – or, inversely, as a series of steps taken by a sleepwalker*".

[723] C. Castoriadis, The Ontological Import of the History of Science, p. 366. Besides, that would adequately explain why "*one does not pass from Newton to Einstein by continuous transition*", for "*to make the passage, one must replace "it is true that P" with "it is not true that P""*.

historical ruptures results to the succession of the latter as other recreation of the newly introduced ensidic logic. After all, a change in scientific theory manifests a change in the way that a social-historical exercises the determining of Being and, thus, demonstrates the scientific image of the natural world.

In the end, Castoriadis understands the history of science as a sequence of creation, in which scientific theories spring from succeeding historical ruptures that occur and liberate the creative imagination of the social-historical. That being said, theories are creations ex nihilo, developed upon the already instituted axioms, and allow new and essentially other viewpoints on our Cosmos. That conclusion, however, remains incomplete, for the contribution of the social individual and its radical imagination play an irrefutable role in that process.

10.5. The social individual as the 'knowing subject' of scientific reality: A social-historical creation

In spite of the critical contribution by the social-historical to the development of scientific knowledge, the whole project would be standing on quicksand, if the scientist as a social individual would not come into the fold. For all things considered, it is the individual that radically imagines and primarily creates, even if its creations are vastly pre- and post-formulated by its social Eigenwelt. That being said, the creative potential, along with the perceptional radius, are posited by the social historical, in the arms of which arises an observing social individual, potent of becoming the knowing subject for scientific reality.

Fundamentally, Castoriadis claims that "*the mere existence of this process of knowing says something about* what is – *therefore, about what* is – *as well as about* the one who knows – *therefore about another aspect of being*"; and since the being is acknowledged as partially organizable and knowable, as discussed above, then "*through the history of science is manifested a subject capable of knowing this world in a certain manner and of altering this knowledge of the world as it itself alters itself*" [724]. Therefore, stepping beyond the Kantian ontology, Castoriadis attempts the following standpoints: firstly "*that all knowledge is knowledge* of *(*by*) a subject*"; secondly, "*that, therefore, such knowledge is the deed of the subject*"; thirdly, that this knowledge "*is, in its organization, decisively affected by the organization of the subject as knowing subject*"; and, finally, "*that, if such knowledge has to have validity for every subject, other requirements also appear*"[725].

Given these primary statements, it is clear that the topic of the 'knowing' social subject is deeply associated, on the one hand, with the radical imagination that co-exists in the social individual and, on the other hand, with its perception over the natural world through its social Eigenwelt.

[724] C. Castoriadis, The Ontological Import of the History of Science, p. 344
[725] C. Castoriadis, The Ontological Import of the History of Science, p. 344-5

Firstly, let us recall that remnants of the psychic monad and its radical imagination continue to reside in the social individual. In terms of scientific praxis, this radical imagination is signifying that "*there is a creative potentiality to the subject – to the singular subject – also* in the domain of knowledge*, which is source of innovation*"; what is more, due to these monadic remnants, even when the social-historical is altering its established knowledge of its world, each time "*the subject does not "adapt" itself*", but instead "*it* posits *new* thinkable figures *of Being/being as knowable and thinkable*" [726]. This resistance of the psychic monad, even when socialized, is channeled through its radical imagination, which stands out as "*a virtually communicable – figurable and sayable – presentational potentiality*" – not "*through its "reason" or through its "understanding*"[727].

That being said, we may conclude that the reconciliation of the social-historical and its social imaginary with the psychic monad and its radical imagination is also manifested on the 'knowing subject' of scientific praxis: via social imaginary significations the social-historical pinpoints the scope, in the extent of which a scientist perceives and understands natural reality; however, inside that scope, the scientific subject can project its imaginary potential and create a partially other scientific image of the Cosmos which in turn may affect the scope provided by the social-historical and under circumstances be transformed into a newly emerged social imaginary signification.

Secondly, since the perception of the social individual, as already shown, is 'colored' by its respective social-historical, correspondingly the scientific subject observes the natural world majorly under the orientations given by its instituting social Eigenwelt, which exemplifies "*the existence of* potentialities *(*dunameis*) that cannot be imputed to determinate "subjects""* [728]. Following the same claim contra solipsism, Castoriadis states that "*the "knowing subject" is not and cannot be ego—and still less* ego-logical" [729]. For example, inasmuch as "*language and understanding are social-historical creations*", then these imaginary institutions "*have to be imposed upon the singular psyche and permit the latter to make something of the debris of its prehuman ensidic organization*"[730], thus becoming essentially presupposed for the development of the scientific praxis in any possible framework. Consequently, even for scientists and in spite of their acknowledged creative imagination, "*there is no* ego-language *any more than some* mono-understanding"[731], since language itself incorporates instituted imaginary significations.

This claim does not stand against the creative potential of the scientist. On the contrary, "*the* liberation *of this creative imagination requires a set of social-historical conditions that, themselves, pertain to the social imaginary*" [732]. That is because "*without language, without understanding, without reference to a "reality" and even to the tradition of research, this imagination would*

[726] C. Castoriadis, The Ontological Import of the History of Science, p. 373
[727] C. Castoriadis, The Ontological Import of the History of Science, p. 373
[728] C. Castoriadis, The Ontological Import of the History of Science, p. 357
[729] C. Castoriadis, The Ontological Import of the History of Science, p. 372
[730] C. Castoriadis, The Ontological Import of the History of Science, p. 372-3
[731] C. Castoriadis, The Ontological Import of the History of Science, p. 373
[732] C. Castoriadis, The Ontological Import of the History of Science, p. 367. Historically speaking, Castoriadis asserts that historically these conditions "*have been met in modern Western Europe only*".

produce only private phantasms; with them and through them, it can create a knowledge"[733]. In that sense, insofar generally concluded that "*social-historical existence is an* absolute *condition for subjectivity*"[734], this same condition is required for the emergence of the scientist as the observing subjectivity. For only then the scientist becomes capable of perceiving the Cosmos through the ensidic logic of its Eigenwelt; and, since his creative imagination has been liberated and simultaneously oriented by the social-historical, the scientist thusly becomes also capable of positing the respectively *new* scientific knowledge[735]. Thus considered, even if the singular creative potentiality is expressed only through the given social institutions, still it is possible for the psyche itself to project a partially or entirely different cosmological viewpoint.

It is not without importance that for this problematic Castoriadis referred to Einstein and his statements on scientific perception. When Werner Heisenberg was narrating his discussion with Einstein, the latter claimed that, insofar as "*it is quite wrong to try founding a theory on observable magnitudes alone*", then "*it is the theory which decides what we can observe*"; that is because only when the phenomenon is fixated in our consciousness through the measuring apparatus, then "*we must be able to tell how nature functions, must know the natural laws at least in practical terms, before we can claim to have observed anything at all*"; hence, "*only theory, that is, knowledge of the natural laws, enables us to deduce the underlying phenomena from our sense impressions*"[736]. Given this assertion, Castoriadis deduces that, when it comes to the scientific understanding of a natural stratum, its "*coherence and lacunarity, adequacy and deficiency are such obviously only in relation to the corresponding "categorical system"*", which naturally preexists and is presupposed in order for the strata to be observed; and while these characteristics are of course not the products of that system, "*there does not exist in itself an organization of the given that is imposed absolutely, nor exists a question that springs on itself and bears meaning outside of any theoretical framework*"[737]. Under the light of this analysis, Castoriadis stands in contrast to the logical positivism of the Wien circle and to the theory of falsification by Sir Karl Popper, because "*a scientific theory worthy of its name is never merely falsifiable through the presentation of a fact of experience*", whereas – as Einstein pointed out – "*a fact of experience is such inside the framework of and corresponding to a theory*"[738]. Therefore, it is concluded that "*we cannot pretend to believe*

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[733] C. Castoriadis, The Ontological Import of the History of Science, p. 373

[734] C. Castoriadis, The Ontological Import of the History of Science, p. 373

[735] It is important to underline that, according to Castoriadis in The Ontological Import of the History of Science, p. 373, "*this subjectivity is far from being "simply logical",* even *in its "logical" and "knowing" operation*", because it is granted a creative capacity through its radical imagination and its sublimation to the social imaginary; given that, this creative process towards scientific knowledge could not be done only "*through its "reason" or through its "understanding""*, because these indeed "*can contrive and corroborate, systematize or deduce*", nonetheless "*neither the one nor the other can* posit *anything that is* new *and has a* content".

[736] W. Heisenberg, Quantum Mechanics and a Talk with Einstein, in *Physics and Beyond – Encounters and Conversations*, 1971, translated by A.J. Pomerans, Harper&Row Publishers, New York-Evanston-London, p. 63. See also C. Castoriadis, Science moderne et interrogation philosophique (in French), p. 225.

[737] C. Castoriadis, Science moderne et interrogation philosophique (in French), p. 225

[738] C. Castoriadis, Science moderne et interrogation philosophique (in French), p. 228. Especially concerning falsification by Popper, see also C. Castoriadis, The Ontological Import of the History of Science, p. 370, where this theory is condemned for being "*incapable of thinking two things at the same time: namely, that Newton's theory is*

that exists a world of facts on itself, facts that remain such as they are beforehand of and independent from any scientific interpretation"[739]; and such interpretation is provided only by the categorical system placed outside of the singular individual, insofar as is socially instituted by the respective Eigenwelt. In that sense, the 'coloring' of the scientific perception by the social-historical is formulated beforehand through the emergence of scientific axioms and theories; and indeed its impact orients the perceiving capacity and precedes any empirical observation by the social individual as the 'knowing' subject of the scientific reality.

The example hereto provided by Castoriadis – drawn by Thomas Kuhn – lies with Aristotle and his theory on motion in comparison to the subsequently succeeding theories by Newton. Aristotle was "naturally" led to – and prevented to straddle beyond – the concept of strict spatial determination, "*because, for him, "qualities" are very important; because his notion of movement is not only that of "local movement," but includes also alteration, growth and decay, and, lastly, generation and corruption ("qualitative" movements); because "local movement" appears to him in a sense, too, as a change of quality; and because, these changes being, as a general rule, "natural," there should also be natural place*" – else, "local finality *for things*" [740]. To that argument, Castoriadis contributes that, in order for Aristotle to have thought movement through a different scope, he would have to presuppose as an axiom the infinity of space, which must be rejected as wholly impossible; that is because "*for Aristotle, space* has to *be finite, the world closed and spherical*" [741]. And that is the case, in spite of the fact that ancient Greek thought not only did not deny the notion of infinity, but actually had "also *created the notion of infinity, in mathematics as well as in physics*"[742]. However, "*Aristotle repeats* ad nauseam *that there can be no infinity in actuality, and he does so precisely because a host of prior and contemporary thinkers had affirmed the* contrary"; and "*while not completely rejecting this idea*", Castoriadis claims that he "*put it back, so to speak, "in its place": infinity is only* virtual*, the series of whole numbers or the subdivision of the line into segments* does not stop – *but they can never be* given *together all at once (*hama*)*"[743].

Based on this standpoint, Castoriadis deduces that "*Aristotle (and ancient Greeks generally) can both reject spatial infinity and accept temporal infinity: an infinite past, an infinite future "are" only virtually; an infinite space (and infinite worlds) would signify an infinite totality given in actuality*"[744]. Therefore, strict spatial determination, being the social instituted signification of his social-historical Eigenwelt, transcends to an axiomatic metaphysical thesis, from which not even Aristotle could not liberate himself; nonetheless, insofar as infinity was indeed discovered and

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false with regard both to its own pretensions to unqualified truth and to the incarnation of these pretensions in his axioms; and that Newton's theory is true (or, I really mean, accurate) in a domain of validity Newton could never have dreamed of when he created it (not because of the dimensions, but because of the very nature of the objects involved in this domain)".

[739] . Castoriadis, Science moderne et interrogation philosophique (in French), p. 228

[740] C. Castoriadis, The Ontological Import of the History of Science, p. 361

[741] C. Castoriadis, The Ontological Import of the History of Science, p. 361

[742] C. Castoriadis, The Ontological Import of the History of Science, p. 361. Apart from the *apeiron* by Anaximander as already illustrated, Castoriadis also reminds that "*the great Democritus, for whom there were only "atoms and the void", taught […] the* infinity of space and of worlds".

[743] C. Castoriadis, The Ontological Import of the History of Science, p. 361

[744] C. Castoriadis, The Ontological Import of the History of Science, p. 361

associated with the dominating cosmological viewpoints, this social 'grip' could not resist the Philosopher's intellect – along with other ancient Greek philosophers'.

Lastly, as a confirmation to his abovementioned claims, Castoriadis' reception of modern science is iconically manifested as follows: "*The physicist of today (and even of the time of Niels Bohr) is to be fully welcomed into the house of philosophy when he repeats, for example, that there are phenomena only with reference to "observations made in well specified circumstances, including the description of the whole experimental set-up", and that "the quantum systems we call 'particles' ... have no properties (indeed, in relativistic physics, scarcely any existence)* in themselves*. These they have solely* for us*, and this in ways that depend on the kind of instrument by means of which they are observed.*"[745]

10.6. Reconciling the objective with the subjective

Worthy of mentioning as the last hereby issue is the relation and the reconciling approach of the objective with the subjective when it comes to scientific perception. In general, when the world is channeled through the human senses, the data extracted are subject to organizing and understanding; this stage of perception demands not merely the sensors, but an additional processor – for us, the biocomputer and the social-historical –, capable to fulfill even arbitrarily the act of understanding and provide meaning to the world. To that problematic, in terms of the origins of this procession diverge two traditional paths: either objectivism, meaning that reality, organized and organizable as it is, is reflected through the social-historical and projected through the human senses is regarded as 'objective'; or subjectivism, meaning that reality is processed and given meaning by the singular psyche, along with the social-historical, and, thus, is regarded as strictly 'subjective' – or, perhaps, 'collectively subjective'. Let us recall that the radical imagination of the psyche does not cease when socialized, but resides partially active inside the social individual and, as such, is projected when called upon, as a reminiscent remnant of the ruptured monadic closure.

To that dilemma, Castoriadis answers by surpassing it, for "*the two aspects—the "objective" and the "subjective"—are absolutely indissociable*"[746]. Specifically put, "*there is no way of getting around the solidarity of these two dimensions – the "subjective" and the "objective" – their perpetual intertwining*", because "*each new step in one of these directions refers us back once again to the other – and vice versa*"; thus "*all knowledge is a coproduction; and, in nontrivial cases, we cannot truly separate out what "comes from" the subject and what "comes from" the object*"[747]. Based on these claims, contrary to the Kantian tradition[748], Castoriadis consents to what

[745] C. Castoriadis, The Ontological Import of the History of Science, p. 345
[746] C. Castoriadis, The Ontological Import of the History of Science, p. 344
[747] C. Castoriadis, The Ontological Import of the History of Science, p. 345
[748] See C. Castoriadis, The Ontological Import of the History of Science, p. 345-6, where he comments as follows: "*That a philosophy was able to affirm that it could furnish the "conditions of possibility for experience" by looking* uniquely *at the "subject" – claiming, therefore, that what it says would and does have validity* in any world whatsoever*, is one of the most astonishing absurdities ever registered in the history of great thought. It is this absurdity that is at the*

he names "*the* principle of the undecidability of origins", since "*for the near-perfect observer, the question of knowing, in an ultimate sense, what comes from the observer and what comes from the observed is undecidable*"; as such "*we play this game – but we cannot play it all alone, neither all alone as "individuals" nor all alone as a "collectivity of subjects"*"[749]. Therefore, in an attempt to solve the "*the perennial philosophical dispute between objectivism and subjectivism*", Castoriadis concludes that "*we are in no position, from an ultimate point of view, to separate rigorously and disentangle absolutely that which, in these constructions, originates in the constructing subject – in this case, society – and that which appertains to the world in itself, to what there is*" and, consequently, "*our effort to achieve such a separation is certainly neither sterile nor meaningless, on the contrary; but it is bound to be interminable*"[750].

Thus acknowledged, Castoriadis surpasses the traditional distinction between objectivism and subjectivism. Instead, he establishes the concept of 'collective' perception, for which the subject of knowledge is "*indissociably the society/individual*", which "*first puts into question this ensidic organization's dependence on its own imaginary significations and then freely creates under certain minimal constraints, in and through mathematics, apparently gratuitous ensidic systems or quasi-systems, a great number of which nevertheless* are found *to correspond, in one manner or another, to the organization of this or that other stratum of physical Being/being*"[751]. However, this collective approach is differentiated from the concept of the 'life-world', as late Husserl and early Heidegger suggested[752]. On the contrary, collective means that, on the one hand, the social-historical does not directly perceive, but projects its meaningful significations to the "subjective" perception of its individuals and organizes the external reality at the broadest extent possible; simultaneously, on the other hand, the external reality projects its own – already organized – characteristics to be "objectively" perceived by the individual perception, but is given meaning under the reflection of the significations that the respective social historical manifests upon its perceiving individual. In that sense, perception is not merely objective, because its object is re-organized and given meaning by the significations of the social-historical; whereas perception is not merely subjective, because this resultant reorganization is constraint by the already organized order that resides in reality itself. In accordance to this juxtaposition, we claim that perception is collective.

It is worth to underline that Poincare had already implied that that same collective dimension signifies the closest possible approach to objectivity. In his words: "*What guarantees the objectivity of the world in which we live is that this world is common to us with other thinking beings. Through the communications that we have with other men, we receive from them ready-made reasonings; we know that these reasonings do not come from us and at the same time we recognize in them the work of reasonable beings like ourselves. And as these reasonings appear to*

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foundation of the Critique of Pure Reason *– which, in a paradox familiar within the history of philosophy, does not prevent the* Critique *from remaining an inexhaustible source for reflection*".

[749] C. Castoriadis, The Ontological Import of the History of Science, p. 345

[750] C. Castoriadis, Time and Creation, p. 387

[751] C. Castoriadis, The Ontological Import of the History of Science, p. 369

[752] See above the chapter on the perception of the social individual.

fit the world of our sensations, we think we may infer that these reasonable beings have seen the same thing as we; thus it is we know we have not been dreaming"[753]. To that same topic, Talbot similarly suggested that "*the brain perceives what it wants to perceive*", meaning that "*our senses are not separate from what is 'out there', but are intimately involved in a highly complex feedback process whose final result is to actually create what is 'out there'*"[754]; thus given, if existing, "*the world is real only in the sense that it has an objective existence for, and is not a projection of, the individual mind*", whereas at the same time "*the world of matter is not a projection of the individual mind, but its reality is coordinate with that of the individual mind*"[755].

Under the light of the viewpoints above, the traditional epistemological antithesis between the 'subjective' and the 'objective' is re-displayed into new terms: following the acknowledgement of the social-historical as an intermediary field, the 'collective' ascends to reconcile the naïve materialism of objectivism and the naïve idealism of subjectivism.

11.***Final conclusions***

Ultimately, this thesis attempted to approach the social-historical realm and the scientific praxis under the scope of the social imaginary arche, as illustrated by Cornelius Castoriadis. To that end, the milestone that implicitly or explicitly serves as the connective web for the issues addressed by the hereby study is the notion of the dyadic ontology, simultaneously constituted by a rational-physical and an imaginary-metaphysical dimension, a dipole the poles of which coexist in a constant clash. In each and every one of these cases, the imaginary dimension bears the characteristic to be essential and only capable to provide an answer to the questions every society posits to itself, even if this very question remains principally and authentically non-answerable; whereas, the answers given by radical and social imaginary are not logically-grounded, are 'arbitrary', meaning that they can be neither verified, not falsified in a rational or empirical manner.

That concept is tentatively manifested in the following sections of our Being. First of all, natural reality as the scientific object is divided in observable and non-observable realms, deeply entangled with one another, the former being physically observed by empirical means, the latter metaphysically straddled by imagination; secondly, that imagination unfolds the problematic of the realm of metaphysics as an independent ontological field, deeply bound and coexisting with the physical realm; thirdly, the individual is partially formulated by its social-historical realm, yet is still driven by its primary core, its monadic psyche; fourthly, creation ex nihilo is indeed the vessel of radical imaginary and of social imaginary, yet is extensively constraint by the ensidic logic; fifthly, instituted social imaginary significations incorporate expressively these two dimensions, the imaginary as their arche and the ensidic as the elaborating development of that same arche; sixthly, the human Eigenwelt is formulated on the world of the living being, which is empirically receptive

[753] H. Poincare, The Value of Science, p. 347
[754] M. Talbot, p. 94
[755] M. Talbot, p. 100

by its physiology, and the world of the social individual, which in accordance to its social imaginary arche determines the part of the observable world that is deemed as meaningful; seventhly, human perception is indeed based on the data primarily received by the senses, yet is given meaning – else, 'colored' – by the social institutions that reside in the Eigenwelt of the perceiving social individual; eighthly, from the first natural stratum emerges at the same time a locally ensidizable natural order and a whole heterogeneous chaotic counterpart; ninthly, scientific axioms, attempting to impose order upon this chaotic heterogeneity, consist of metaphysical ontological presuppositions, born as non-arbitrary imaginary creations that fulfill the ensidic demands, in order to signify the arche in scientific knowledge; tenthly, history of science is developed along the categorical systems that are socially instituted during each respective historical era and by each respective human Eigenwelt, which interpret scientific findings according to the axiomatic concepts instituted; and, lastly, the scientist as the only possible 'knowing' subject of natural reality is driven by its inner creative potentiality, nonetheless only through the institutions and under the orientations of a specific social Eigenwelt.

Along with the aforementioned remarks, one of the goals to be accomplished is to especially establish Castoriadis among the literature related to philosophy of science; for despite his well-acclaimed work on political philosophy and profoundly the project of social autonomy, his ontological perspective on philosophy of science and scientific praxis remains until today surprisingly unknown – or ignored. However, following the historical dimensions of scientific knowledge, as already developed by his preceding thinkers, it is hereby believed that the concept of instituting social imaginary may contribute a breakthrough for understanding the scientific conquest and is sincerely hoped to stand as the stepping stone for the ascending of modern science.

As the final word, we shall adopt the fundamental belief of Castoriadis "*that* there *is truth – and that* it is to be made/to be done*, that to attain it we have to create it, which means, first and foremost, to* imagine *it*"[756]; and that is precisely his end for referring to William Blakes' poetic insight: "*What is now proved was once only imagin'd*"[757].

[756] C. Castoriadis, The Ontological Import of the History of Science, p. 373

[757] Proverb 33 of the Proverbs of Hell in *The Marriage of Heaven and Hell*.

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